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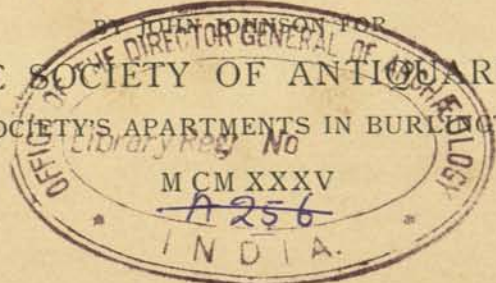
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TABLE OF CONTENTS

	PAGE
I.— <i>Recent Investigations regarding the Fate of the Princes in the Tower.</i> By LAWRENCE E. TANNER, Esq., M.V.O., M.A., F.S.A., and Professor WILLIAM WRIGHT, F.R.C.S., F.S.A.	1-26
II.— <i>On a Picture commemorative of the Gunpowder Plot, recently discovered at New College, Oxford.</i> By L. G. WICKHAM LEGG, Esq., M.A.	27-39
III.— <i>The Roof-bosses in Canterbury Cathedral.</i> By C. J. P. CAVE, Esq., M.A., F.S.A.	41-61
IV.— <i>A Thirteenth-Century Choir of Angels in the North Transept of West- minster Abbey and the Adjacent Figures of Two Kings.</i> By C. J. P. CAVE, Esq., M.A.; F.S.A., and L. E. TANNER, Esq., M.A., F.S.A.	63-67
V.— <i>Notes on the Evolution of Plate Armour in Germany in the Fourteenth and Fifteenth Century.</i> By J. G. MANN, Esq., M.A., F.S.A.	69-97
VI.— <i>The Avebury Excavations, 1908-1922.</i> By H. ST. GEORGE GRAY, Esq., F.S.A.	99-162
VII.— <i>Seal Bags in the Treasury of the Cathedral Church of Canterbury.</i> By Miss GERTRUDE ROBINSON and Miss H. URQUHART	163-211
VIII.— <i>The Roman Theatre at Verulamium, St. Albans.</i> By Miss KATHLEEN M. KENYON, M.A.	213-261

LIST OF ILLUSTRATIONS

PLATE		PAGE
	RECENT INVESTIGATIONS REGARDING THE FATE OF THE PRINCES IN THE TOWER :	
	Fig. I. Plan of part of the Tower of London	9
	[Plan of the King's Lodgings]	26
I.	I. Chester Herald's acknowledgement. 2 Note in Miss Daniel's copy of More's <i>Historie . . . of Edward V.</i> 3. The Urn in Henry VII's chapel, Westminster Abbey facing	14
II.	I. 'Richard, Duke of York'. Cranial vault. 2. 'Edward V'. Cranial vault. 3. 'Edward V'. Cranium <i>Norma occipitalis</i>	
III.	I. 'Edward V'. Lower jaw. 2. 'Edward V'. Upper jaw. 3. 'Edward V'. Axis. 4 and 5. 'Richard, Duke of York'. Part of right half of lower jaw	
IV.	I. Left first rib of 'Edward V', and right first rib of 'Richard, Duke of York', side by side for comparison. 2. Left second rib of 'Edward V', and right second rib of 'Richard, Duke of York', side by side for comparison. 3. Left clavicle of 'Edward V', and right clavicle of 'Richard, Duke of York', side by side for comparison. 4. Scapulae of 'Edward V'	between 20 and 21
V.	I. Humeri of 'Edward V' and 'Richard, Duke of York', side by side for comparison. 2. Ulnae of 'Edward V' and 'Richard, Duke of York', side by side for comparison 3. Femora of 'Edward V' and 'Richard, Duke of York', side by side for comparison. 4. First metatarsals of 'Edward V'. 5. Fifth metatarsals of 'Edward V' and 'Richard, Duke of York', side by side for comparison	
VI.	I. Skiagram of the right part of the lower jaw of 'Richard, Duke of York'. 2. 'Edward V'. Skiagram of the alveolar part of the left upper jaw. 3. 'Edward V'. Skiagram of the alveolar part of the right upper jaw. 4. Skiagram of the right part of the mandible of 'Edward V'. 5. Skiagram of the left part of the mandible of 'Edward V' facing	22
	ON A PICTURE COMMEMORATIVE OF THE GUNPOWDER PLOT :	
VII.	Picture painted to the order of Richard Haydocke, perhaps by John Percivall of Salisbury, in commemoration of the twenty-fifth anniversary of the Gunpowder Plot. Now at New College, Oxford	between 30 and 32

PLATE		PAGE
	THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL :	
	Fig. 1. Boss in south aisle. Fig. 2. Boss at eastern crossing . . .	45
VIII-IX.	[The Roof-bosses]	between 46 and 47
	A THIRTEENTH-CENTURY CHOIR OF ANGELS AND THE FIGURES OF TWO KINGS :	
X-XI.	[The Choir of Angels]	between 64 and 65
XII.	[The Choir of Angels]	} between 66
XIII.	1. King Edward the Confessor. 2. King Henry III.	} and 67
	PLATE ARMOUR IN GERMANY IN THE FOURTEENTH AND FIFTEENTH CENTURY :	
	Fig. 1. Wall painting of battle of Ghibellines and Guelfs in the Castle of Sabbionara	72-73
	Fig. 2. Bascinet, egg-shaped type. Fig. 3. Klappvisier	74
	Fig. 4. Bascinet, international type	75
	Fig. 5. Gauntlet, fourteenth century	77
	Fig. 6. Detail from an heraldic drawing	82
	Fig. 7. Milanese armour. Fig. 8. Marks	87
	Fig. 9. German armourer and his apprentice at work	88
XIV.	1. Effigy of Heinrich Otto, Landgraf von Hessen. 2. Bas-relief of one of the Electors of Bavaria. 3. Effigy of Johannes von Falkenstein facing	70
XV.	1, 2. Helm of the xivth century. 2. Combat of foot-soldiers, wall- painting facing	71
XVI.	1. Effigy of a knight of the Hohenberg family. 2. Belt, velvet- covered breastplate. 3. Effigy of Günther von Schwarzburg facing	72
XVII.	1. St. Oswald. Painting on panel. 2. Effigy of Graf Moritz von Oldenburg facing	73
XVIII.	The Virgin Mary with the Angel Powers. Altarpiece of Albrecht II	between 76 and 77
XIX.	1. Effigy of Peter von Stettenberg. 2, 3. Breast with lisière d'arrêt and fluted backplate. 4. Sabothai bringing water to King David. Detail of painting	
XX.	1. Effigy of Carl von Eberstein. 2. Effigy of Ludwig I, Landgraf von Hessen. 3. Effigy of Sigmund von Lenters- heim	
XXI.	1. Wooden statuette of St. George and the Dragon. 2, 3. Two sallets	
XXII.	1, 3, 4. Breast, tassets, sallet, and beaver of the Gothic armour from Schloss Hohenaschau. 2. Bronze effigy of Jörg Truchsess von Waldburg facing	80
XXIII.	Cuisses and backplate of the Gothic equestrian armour from Schloss Hohenaschau facing	81

LIST OF ILLUSTRATIONS

ix

PLATE		PAGE
XXIV.	1. Arms of the Gothic equestrian armour from Schloss Hohen- aschau. 2. Vambrace and gauntlet combined	between 84 and 85
XXV.	1. Wooden statuette of St. George and the Dragon. 2. Effigy of Dietrich von Berlichingen	
XXVI.	1. Drawing of St. George and the Dragon. 2. Armour of Sigmund der Münzreicher. 3. Engraving of Sigmund	
XXVII.	1. Detail, from a painting on panel, of the Road to Calvary. 2. Drawing of a seated soldier	
XXVIII.	Italian armour in Germany. 1. Detail of the Crucifixion, painting. 2. Effigy of Ulrich von Hohenrechberg. 3. Armour with Milanese marks facing	88

THE AVEBURY EXCAVATIONS :

	Fig. 1. Sectional diagram across Cutting III	118
	Fig. 2. Sections taken across the bottom of the Fosse, Cutting VIII	121
	Fig. 3. Section showing a rise in the floor of the Fosse	126
	Fig. 4. Sectional diagrams of Cuttings IV, V, VI, VII across the Southern Causeway	129
	Fig. 5. Plan and sections of the excavation at the base of the most southern prostrate stone of the southern inner group	133
	Fig. 6. Prehistoric Pottery	137
	Fig. 7. Prehistoric Pottery found in the Fosse	139
	Fig. 8. Bronze Fibula, inscribed 'Aucissa', found in the Fosse	156
XXIX.	Plan of Avebury in 1912—the stone circles and earthwork, and the central and eastern parts of the modern village facing	99
XXX.	1. View of Avebury, looking SE. 2. The wooded part of the NNW. Fosse and Vallum	between 100 and 101.
XXXI.	1. The E. earthworks, looking NW. 2. The E. and SE. earthworks, looking NE.	
XXXII.	1. View taken from the NE. showing the excavation made round the most southern prostrate stone. 2. Dry-stone walling in the centre of the village	
XXXIII.	1. The southern of the two 'Longstones' at Beckhampton. 2. 'The Cove', from a water-colour	
XXXIV.	1. Bottom of the Fosse, Cutting VIII. 2. Distant view of Silbury Hill taken from near the SW. Vallum facing	112
XXXV.	1. View of the excavation of Cutting I, Fosse, looking SW. 2. An- other view of the same excavation, showing a much larger area of the solid chalk floor facing	113

LIST OF ILLUSTRATIONS

PLATE		PAGE
XXXVI.	1. Sectional diagram of Cutting I (West face) across the Fosse, on the line E-F of the plan. 2. Section along the line of the five Fosse Cuttings (nos. I, II, III, VIII, and IX) . . . facing	114
XXXVII.	Sectional diagrams of Cutting II across the Fosse, on the lines G-H and J-K of the plan . . . facing	116
XXXVIII.	1. View of Avebury, taken from the S., showing some of the remaining stones. 2. View, looking WNW., of the early stages in the excavation of Cutting IX, Fosse . . . facing	120
XXXIX.	1. The re-excavated Fosse, Cutting VIII, looking E. 2. The same cutting showing at closer quarters the stratified layers of silting . . . facing	121
XL.	Sections of the Fosse and Vallum, Avebury (figs. 1-3) . . . facing	122
XLI.	1. The end walls of Cutting IX. 2. General view, looking NW., of the re-excavated Fosse, Cutting IX . . . facing	124
XLII.	1. View, looking SSE., of the two Sarsens. 2. View of Cutting X through the Avebury Vallum . . . facing	125
XLIII.	Plan and Sections of Entrance Causeway and Fosse on the SSE. side of Avebury . . . facing	128
XLIV.	Avebury, Wilts. Average section of the south Fosse . . . facing	136
XLV.	1. Cutting IV across the southern Entrance Causeway, looking WSW. 2. View of the E. end of the Fosse, Cutting IX, taken from the W. . . facing	142
XLVI.	Flint implements and Bone Pin found in the Fosse and Vallum . . . facing	143
XLVII.	Antler Picks found in the Fosse . . . facing	154
XLVIII.	Antler Picks, Rakes of Antler, worked Shoulder-blades, and other bone implements, found in the Fosse . . . facing	155

SEAL BAGS IN THE TREASURY OF THE CATHEDRAL CHURCH OF CANTERBURY :

Fig. 1.	Seal bags nos. 1 and 2: reconstruction of Peacock design . . .	172
Fig. 2.	Sacred tree between two hills . . .	173
Fig. 3.	Ram-headed bird from Church of Achthamar. Fig. 4. Deity with horned bird's head . . .	176
Fig. 5.	Griffin and serpent; from capital in crypt of Canterbury Cathedral . . .	178
Fig. 6.	Deity: probably moon-god in a crescent-shaped boat . . .	181
Fig. 7.	Double-headed peacock from St. Cuthbert silk in Durham Cathedral . . .	183
Fig. 8.	Horse in foliage from the Easby Cross . . .	184
Fig. 9.	Reconstruction of double-headed eagle design . . .	188
Figs. 10, 11.	Examples of double-headed eagles from the seal cylinders . . .	189
Fig. 12.	The Ruhk-bird from Yule's edition of Marco Polo's travels . . .	191

LIST OF ILLUSTRATIONS

xi

PLATE		PAGE
	Fig. 13. Reconstruction of design of man and bird	192
	Fig. 14. Indian deity riding on Garuda, from Sanchi rock-relief.	
	Fig. 15. Naga prince from Cambodia, with hood formed by seven serpents. Fig. 16. The Garuda carrying off a Naga	194
	Fig. 17. Winged figure from ruined Buddhist shrine at Miran	196
	Fig. 18. Chinese draw-loom	207
	Diagrams 1, 2	208
	Diagrams 3-5	209
	Diagram 6	210
XLIX.	Seal bags nos. 1 and 2. Peacocks confronting on each side of stylized Tree facing	176
L.	1. Seal bag no. 14. Cufic inscription with heart-shaped ornament. 2. Seal bag no. 6. Griffin and Bird with heart-shaped ornament facing	177
LI.	Seal bag in the British Museum facing	184
LII.	1. Seal bag no. 9. Design of Crescent and Stars. 2. Seal bag no. 17. Bird and animal design facing	185
LIII.	1. Seal bag no. 23 <i>c</i> . Griffin and Geese design. 2. Seal bag no. 23 <i>d</i> . Design of confronting Griffins facing	198
LIV.	1. Seal bag no. 22. Dragon design. 2. Seal bag no. 30. Trellis- work design facing	199
LV.	1. Seal bag no. 15. Double-headed eagle. 2. Seal bag no. 11. Peacocks displayed and animal in foliage facing	200
LVI.	1. Seal bag no. 32. Animal's head. Red damask. 2. Seal bag no. 6. Griffin and bird with heart-shaped ornament facing	202
LVII.	1. Seal bag no. 18. Man's head and birds. 2. Seal bag no. 33. Crimson lozenge pattern brocaded with gold facing	204

THE ROMAN THEATRE AT VERULAMIUM :

LVIII.	1. Air view of theatre. 2. View from north, showing pier at north- east angle of <i>cavea</i> facing	218
LIX.	1. View from west, showing buttresses and offset of Period I wall. 2. View from south, showing supports of external staircase facing	219
LX.	1. South gangway. 2. Stage from south, showing original curved front wall and later straight ones facing	222
LXI.	1. Stage, showing Period II columns. 2. Orchestra, with post- holes of Period II seating platform facing	223
LXII.	1. Curtain slot. 2. Stage after preservation work, with reconstructed column facing	234
LXIII.	1. South gangway, with lateral stairways of Period II. 2. Theatre partially excavated, showing depth of filling facing	235

PLATE		PAGE
LXIV.	1. Fragment of cornice from Period IV Triumphal Arch. 2. Iron counterpoise, probably from curtain-raising apparatus . facing	238
LXV.	1. Évreux. 2. Herbord. 3. Vieil-Évreux. 4. Vieux . facing	239
LXVI.	Painted fragment from Period I stage . . . facing	240
LXVII.	Verulamium: the Theatre . . . facing	248
LXVIII.	Verulamium: the Theatre, Periods I and I A, <i>c.</i> 140-50 A.D. . facing	250
LXIX.	Verulamium: the Theatre, Period II, <i>c.</i> 160-70 A.D. . facing	252
LXX.	Verulamium: the Theatre, Periods III and III A, <i>c.</i> 200 A.D. facing	254
LXXI.	Verulamium: the Theatre, Period IV, <i>c.</i> 300 A.D. . facing	256
LXXII.	Verulamium: the Theatre, seating ramp; orchestra; stage . facing	258
LXXIII.	1. Section C-D through the south gangway. 2. Section E-F through the west gangway. 3. Section between walls of 'curtain slot' in front of the stage . . . facing	260

I.—*Recent Investigations regarding the Fate of the Princes in the Tower.*

By LAWRENCE E. TANNER, *Esq., M.V.O., M.A., F.S.A., and Professor*
WILLIAM WRIGHT, *F.R.C.S., F.S.A.*

Read 30th November 1933

I

HISTORICAL

‘EDWARD Vth ended his reign on the 25th [of June 1483], and with his brother, Richard, then disappears from authentic history. How long the boys lived in captivity and how they died is a matter on which legend and conjecture have been rife with no approach to certainty. Most men believed, and still believe, that they died a violent death by their Uncle’s order.’ In these words Bishop Stubbs¹ summed up a mystery which has never failed to fascinate those who have attempted to probe it.

The only two certain facts are, first, that from the day when Richard, duke of York, joined his brother in the Tower of London neither of the brothers was ever seen again outside its walls, and, secondly, that in 1674 some bones were found by chance under a staircase in the White Tower at the Tower of London which were assumed to be those of the young princes and were buried as such by Charles II’s order in Henry VII’s chapel, Westminster Abbey.

The questions arise, therefore, what relationship, if any, is there between these two facts? Were the bones which were found in 1674 animal bones, as has been more than once hinted by reputable historians, or were they human bones? If they were human bones, were they the bones of two boys of about the reputed age of the two princes, and were the ‘most certain indications’ (to quote the epitaph on the monument in the abbey) which convinced Charles II that they were indeed the bones of the princes, likely to be such as would commend themselves to modern medical science? And, lastly, if the bones were scientifically examined to-day could anything be deduced from them which might throw light on the mystery surrounding the fate of the princes in the Tower?

Strong representations of the importance of the questions under review having been made by responsible persons to our Fellow the dean of West-

¹ *Constitutional Hist. of England*, iii, 231.

minster, he determined in July 1933 (though not without hesitation) to open the urn, in which the bones were alleged to have been deposited, in order that the matter might be fully investigated. It is the result of that investigation which Professor Wright and myself have the honour of laying before the Society.

Professor Wright's paper describes in detail what was actually found, but here it may be said at once that the bones which filled the urn were unquestionably those of two children of approximately the ages of the princes. Such being the case, it seemed desirable to re-investigate such aspects of the story as might either throw light on, or receive corroboration from, what was found.¹

The outstanding question, of course, is the responsibility for the murder or, to put it in a more popular way, the guilt or innocence of King Richard III. It cannot be denied that there is a considerable body of evidence to show that suspicion rested upon him from the earliest times,² and it is certainly most remarkable that so responsible a person as the Chancellor of France should have mentioned the murder as a fact in addressing the Estates General which met at Tours in the January following the presumed date of the murder.³

But none the less there have been many both before and since who have shared the 'Historic Doubts' of Horace Walpole, and our late Fellow Sir Clements Markham endeavoured to fasten the guilt for the murder on Henry VII.⁴ It is, I think, generally held by responsible historians that Dr. Gairdner, who remains the chief modern authority on the reign, successfully disposed of these doubts and theories.⁵ Nevertheless a book has been recently published, which asserts with considerable vigour that Henry VII was responsible, and gives a circumstantial and picturesque account of the murder, which the author definitely states took place in June or July 1486.⁶

¹ It may be noted that Professor Wright and myself worked independently and did not compare our results until we had arrived at our conclusions.

² The evidence may be conveniently found in Ramsay, *Lancaster and York*, ii, 510 and notes; Kingsford, *English Historical Literature in the Fifteenth Century*, pp. 101, 183 n., 184 n.; *Calendar of State Papers—Milanese* i, 299; The Great Chronicle of London ('But afftyr Estyrn [1484] much whysper yng was among the people yt the kyng hadd put the childyr of King Edward to deth'), f. ccix b. By the kindness of the authorities of the Guildhall Library I have been allowed to examine and quote from the manuscript of the Great Chronicle which is now being transcribed for publication.

³ 'Aspicite, quaeso, quidnam post mortem regis Eduardi in ea terra contigerit; ejus scilicet jam adultos et egregios liberos impune trucidari, et regni diadema in horum extinctorem, populis faventibus, delatum.' *Journal des États-Généraux de France, tenus à Tours, 1483-4*, by Jehan Musselin (Documents Inédits), p. 39.

⁴ *Eng. Hist. Review*, vi, 250 et seq.

⁵ *Ibid.*, vi, 444 et seq., and *Richard III* (1898), pp. 119-28.

⁶ Philip Lindsay, *King Richard III. A Chronicle* (1933), p. 325. It is fair to say that the author

It is unnecessary for us to reopen this controversy except as a pure matter of dates. For if it can be shown from historical sources that the ages of the princes at the generally presumed date of the murder, August 1483, correspond almost exactly with the ages of the two children whose bones rest in Westminster Abbey, and if, further, it can be shown that there is a reasonable probability that those bones are in fact the bones of the princes, then it is obvious that the murder must have taken place before the close of the reign of Richard III (August 1485).

On October 1st, 1470, after the flight of her husband Edward IV, the queen, Elizabeth Woodville, together with her three daughters, fled from the Tower at the approach of Warwick the King-Maker, and took sanctuary at Westminster. According to Westminster tradition she was lodged in the Abbot's House, and there, on November 2nd she gave birth to a son, the future Edward V. It is unfortunate that no reference to these events appears among the Abbey muniments,¹ but though the Chronicles disagree as to the exact day of the birth, Miss Scofield has pointed out an entry in the Patent Roll for 1472 whereby a grant of the issues of the Duchy of Cornwall is made to the young prince from Michaelmas, 10 Edward IV, to the 2nd of November following, 'on which day he was born'.² He was probably baptized privately—for the sacrist makes no entry of it on his Account Roll for that year—but we know that the abbot, Thomas Millyng, and the prior, John Estney, were godfathers, and Lady Scrope was the godmother. The next year Edward IV returned in triumph. In gratitude for the hospitality extended to her at Westminster, the queen founded the chantry and chapel of St. Erasmus which was attached to the old Lady Chapel; the king promised a donation of £.100 per annum towards the rebuilding of the nave, while a promise was made on the young prince's behalf that as soon as he was four years of age he would contribute an annual donation for the same purpose. Unfortunately the king's promise was kept but fitfully and, more often than not, the keeper of the New Work had to add to his Account Roll the entry: 'De dono domini Regis centum librarum—nihil hoc anno.' An annual and judicious 'regard' to the prince's treasurer, however, ensured the fulfilment of the prince's promise until 1481-2.³

frankly admits that his book 'is not written for students of history but for the public' (p. 343). Mr. Lindsay has since published a pamphlet entitled *On Some Bones in Westminster Abbey*, giving his views on the subject of this paper.

¹ But the sacrist, treasurer and infirmarer paid small sums towards guarding the church and sanctuary 'tempore advent' Kanciencium' (W. A. M. 19717, 23085, and 19452).

² Scofield, *Edward IV*, i, 546 n., quoting *Cal. Pat. Rolls 1467-77*, p. 365.

³ Rackham, *Nave of Westminster*, p. 33. The Queen while she was in Sanctuary made a donation of 60s. 'pro diversis lesionibus in voltis ecclesie' (W. A. M. 19717).

4 RECENT INVESTIGATIONS REGARDING THE

The date of the birth of the younger prince, Richard, is more difficult to determine. There is no doubt that he was born at Shrewsbury, but the exact year has given rise to considerable controversy. The commonly accepted date, 17th August 1472, based upon the supposed authority of a contemporary manuscript list of Edward IV's children which seems to have belonged to Sir William Dethick, Garter, and is now among the Add. MSS.¹ at the British Museum, is impossible, for the Princess Margaret was quite certainly born on 10th April of that year.² There exists, however, a chronicle at Shrewsbury, which, although it was written in the sixteenth century, appears to be based on local traditions, and contains entries of notable events in the history of the town. These entries are given under the names of the bailiffs of the town who were elected annually in September. Under the year September 1472 to September 1473 there is the following entry: 'This yeare the ducke of yorcke was borne in the blacke frears w^hin the towne of Shrewsbery the wche frears standethe under Sainct Marys churche in the sayde towne estwards.'³

This entry, coupled with the fact that the queen was certainly at Shrewsbury in August 1473, and that Edward IV joined her there for some weeks, suggests that the prince was born in August of that year, and that the king went to Shrewsbury in order to be present at the birth.⁴ On the other hand Perkin Warbeck in the document which he signed on 24th January 1495, in which he made over his rights to the crown of England, in case of his death, to Maximilian, king of the Romans, describes himself as 'under age' at that date, i.e. that he believed himself to have been born not earlier than the year 1474.⁵ The unlikelihood that in so important a document he would have made a mistake in the right age of the prince whom he was impersonating—a mistake which would have exposed him at once as an impostor—has led to the suggestion⁶ that the prince's birth really took place between January 1474 and

¹ Add. MSS. 6113. See also *Gent. Mag.*, 1831, i, 24; *Notes and Queries*, 8th series, ix, 51; and 7th series, vi, 386; G.E.C. Complete Peerage.

² Scofield, *Edward IV*, ii, 60 n. Ramsay, *Lancaster and York*, ii, 469 and note. The princess was buried in Westminster Abbey on Dec. 11, 1472. For inscription formerly on her tomb see Dart, *Westminster Abbey*, ii, 29.

³ I am indebted to Mr. J. B. Oldham, librarian of Shrewsbury School, for kindly copying for me this entry from the Taylor MS. in that library. In a subsequent letter to *The Times* dated December 12, 1933, he pointed out that the Taylor MS. is obviously 'based in its earlier portion upon Holinshed, and that Holinshed makes no mention of the birth of Prince Richard. This goes far to prove that in this particular case of putting the birth between September 1472 and September 1473, the local Chronicler was following local tradition. Unfortunately there is nothing in the Shrewsbury Borough records to throw any light on the question.'

⁴ Scofield, ii, 60 and note.

⁵ Gairdner, *Richard III*, pp. 290, 291.

⁶ Mr. Gilbert West in *Notes and Queries*, cliii, 381.

28th May 1474, on which date the prince was created duke of York. Dr. Gairdner, however, thinks that Warbeck made the mistake in ignorance.¹

The question of the month and the year seems to be settled, however, by a document (pl. I, fig. 1) in the possession of Mr. W. Westley Manning, in which Chester Herald, Thomas Utine (Whiting), acknowledges the gift of a sum of money from the duke of Burgundy, 'que mon dit seigneur ma de sa grace donnee pour une foiz quant en ce present mois de septembre je suis venu pardevers lui en sa ville darlon [Luxembourg] et lui apporte lettres du dit Roy d'Angleterre par lesquelles il signiffie a icellui seigneur de ses nouvelles et mesmement la nativite de son second filz.'

The document is dated 'le troisme jour du dit mois de septembre lan mil quatre cent soixante treize'.² The birth of the prince, therefore, almost certainly took place in August 1473 and probably on the 17th of that month.³

We may now pass on to the crucial year 1483. On 1st May of that year the queen, Elizabeth Woodville, on hearing that the duke of Gloucester had seized his nephew the young king, 'in gret fright and heuines, bewailing her childe's ruin, her frendes mischance, and her own infortune, damning the time that euer shee diswaded the gatheryng of power aboute the kinge, gate herselfe in all the haste possible with her yonger sonne and her doughters oute of the Palyce of Westminster in whiche shee then laye, into the Sanctuare, lodginge her selfe and her coumpanye there in the Abbottes place'.⁴

There shortly before dawn she was visited by the archbishop of York, Chancellor of England, who delivered to her the Great Seal. More states that the archbishop found the queen surrounded by 'much heauinesse, rumble, haste and businesse, carriage and conueyaunce of her stuffe into Sanctuare, chestes, coffers, packes, fardelles, trusses, all on men's backs, no manne vnoccupied, somme lading, somme goying, somme descharging, somme comynge for more, some breakinge downe the walles to bring in the nexte waye... The Quene her self satte alone alowe on the rishes all desolate and dismayde, whome the Archebischoppe coumforted in the best manner hee coulde, shewinge her that hee trusted the matter was nothyng soe sore as shee tooke it for'.⁵

On 4th May Gloucester and the young king reached London, and on the

¹ Gairdner, p. 290 n.

² Mr. Manning sent a copy of this document to *The Times* (December 12, 1933). He has kindly allowed me to examine the original, which is unquestionably genuine, and to have it photographed.

³ With regard to the actual day, it is worth noting that on 17th August, 1480, the duke of York received from the king 'as a gift' a purple velvet gown and the Garter, while the king, the prince of Wales, the marquess of Dorset and Earl Rivers (the queen's brother) all had new robes. It suggests a birthday celebration. N. H. Nicolas, *Wardrobe Accounts of Edward IV*, pp. 160, 161.

⁴ Sir Thomas More, *Workes*, 1557, p. 42.

⁵ *Ibid.*, p. 43.

19th the king was lodged in the Tower, ostensibly to be in readiness for his coronation. On 16th June the queen was induced to surrender the little duke of York, perhaps, as More suggests, because it was told her that 'the king lacketh a playfelowye' and needed 'disporte and recreacion'. Thereupon he was taken first to his uncle, Gloucester, who received him at the door of the Star Chamber with 'many lovyng wordys', and thence 'through the citie honourably into the Tower' where he joined the king, and from which neither of them ever emerged alive.¹ We have one pathetic glimpse of the princes after the gates of the Tower closed upon them. In the Great Chronicle of London it is noted that 'duryng this mayris yere the childyr of Kyng Edward were seen shotyng and playyng in the Gardyn of the Towyr by sundry tymys'.²

No one knows, no one ever will know exactly, what happened subsequently. Our only apparent authority is that remarkable work, Sir Thomas More's *Historie of Kyng Rycharde the Thirde*, and the historical value of the circumstantial account of the murder which he gives has been much disputed. More himself was only a boy in 1483, but he was brought up in the household of Cardinal Morton, who was in a position to know the facts, and it is supposed that More derived his information in part from the cardinal. In the definitive edition of the *English Works of Sir Thomas More*, now in course of publication, Dr. R. W. Chambers and Mr. W. A. G. Doyle-Davidson discuss the literary value of the *History* and the textual problems involved, and they have little difficulty in showing that both the English and Latin versions were, in fact, written by More probably from information derived from Morton, and almost certainly in 1513. But they do not discuss the historical value of the *History*.³ Dr. Gairdner believed that the account 'must bear some resemblance to the truth. It is mainly founded upon the confession of two of the murderers, and is given by the writer as the most trustworthy report he had met with.'⁴ Sir James Ramsay called it an 'uncritical narrative' but 'believed it to rest on substantial fact'.⁵

If, then, we may follow More's account⁶ very briefly, he tells us that Sir James Tyrell was sent by Richard III with a letter to the Constable of the Tower, Sir Robert Brackenbury,⁷ directing him to deliver up the keys to the

¹ Ramsay, ii, 486.

² f. ccix b. Sir Edmund Shaa, Mayor 1482-83.

³ *The English Works of Sir Thomas More* (Eyre and Spottiswood, 1931), ed. W. E. Campbell, pp. 26, 34, 42. See also A. F. Pollard in *History*, xvii, 317.

⁴ *Richard III*, p. 119.

⁵ *Lancaster and York*, ii, 512, 514. Cf. C. L. Kingsford, *English Historical Literature of Fifteenth Century*, pp. 185-90; Oman, *Political History of England*, iv, 481 and note.

⁶ *Workes*, 1557, pp. 67 et seq.

⁷ In *The Times* of December 7, 1933, Mr. K. F. Brackenbury drew attention to the remarkable (and perhaps significant) series of rewards given to Sir Robert Brackenbury in 1484.

bearer for one night. Thereupon Tyrell took possession and directed Miles Forrest, one of the princes' attendants, 'a felowe fleshed in murther before time', and John Dighton, 'a big brode square strong knaue', to smother them in their sleep. They 'about midnight (the sely children lying in their beddes) came into the chamber, and sodainly lapped them vp among the clothes, so bewrapped them and entangled them, keping down by force the fetherbed and pillowes hard vnto their mouthes, that within a while smored and stifled, their breath failing, thei gaue vp to God their innocent soules . . .'. The murderers then called in Tyrell, who 'vpon the sight of them, caused those murtherers to burye them at the stayre foote, metely depe in the grounde vnder a great heape of stones'. Tyrell then rode off to King Richard, who 'gaue hym gret thanks', but 'allowed not, as I haue heard, the burying in so vile a corner, saying that he woulde haue them buried in a better place, because thei wer a kinges sonnes, . . . whereupon thei say that a prieste of syr Robert Brakenbury toke vp the bodyes again, and secretely entered them in such place, as by the occasion of his deathe, whiche onely knew it, could neuer synce come to light. Very trouthe is it and well knowen, that at such time as syr James Tirell was in the Tower, for Treason committed agaynste the moste famous prince king Henry the seuenth [i.e. in 1502], bothe Dighton and he were examined, and confessed the murther in maner aboue writen, but whither the bodies were remoued thei could nothing tel.' More adds that he had learned all this 'of them that much knew and little cause had to lye'.¹

Before we pass to the finding of the bones there is one point of interest to be noted. If More's account of the murder can be trusted, when did it take place? The question is fully discussed by Sir James Ramsay in an Appendix to his *Lancaster and York*.² It will be sufficient to say that from four practically contemporary sources he was led to place the murder between the end of July and the end of September 1483—the most probable dates being between 7th August and 15th August when Richard III was at Warwick, from which place More states that Tyrell was despatched to the Tower.

If this is so Edward V was twelve years and nine months old and Richard,

¹ The Great Chronicle of London has the following entry, which to some extent supports More's account and is interesting as giving the rumours of the time: 'Concideryng the deth of Kyng Edwardys chyldyr Of whom as than men Ferid not opynly to saye that they were Rydd owth of this world. But of theyr dethis maner was many opynyons For some said they were murderid atwene ii Fethyr beddis, some said they were drownyd in malvesy and some said that they were stykkid wyth a venymous pocion, But how soo evyr they were put to deth Certayn it was that beffore that daye they were departid From this world. Of which cruell dede Sr Jamys Tyrell was Reportid to be the doer, but other putt that wygth upon an old servaunt of kyng Rychardes namyd [blank] . . .' (f. ccxii. b and ccxiii).

² ii, 510 *et seq.* The authorities were Sir T. More; the Croyland writer; John Ross; and Jean Molinet.

duke of York (if we take 1473 as the date of his birth) was within a few days of his tenth birthday at the time of their murder.

Our chief authority for the discovery in 1674 of the bones now in Westminster Abbey is Sandford,¹ who, writing in 1677, gives the following account: 'Upon Friday the [17th] day of July. An. 1674 (take this Relation from a gentleman, an eyewitness, and principally concerned in the whole scrutiny)—in the margin is printed John Knight Esq., Principal Chirurgeon to His Majesty King Charles II²—in order to the rebuilding of the several Offices in the Tower, and to clear the white Tower from all contiguous Buildings, digging down the Stairs which led from the King's Lodgings, to the Chappel in the said Tower, about ten foot in the ground, were found the Bones of two striplings in (as it seemed) a wooden Chest, which upon the survey were found proportionable to the ages of those two Brothers viz about thirteen and eleven years. The Skul of the one being entire, the other broken,³ as were indeed many of the other Bones, as also the Chest, by the violence of the Labourers, who not being sensible of what they had in hand, cast the rubbish and them away together, wherefore they were caused to sift the rubbish, and by that means preserved all the Bones. The Circumstances from the Story being considered, and the same often discoursed with the Right Honourable Sir Thomas Chichley Kt., Master of the Ordnance, by whose industry the new Buildings were then in carrying on, and by whom this matter was reported to the King: upon the presumptions that these were the Bones of the said Princes, His Majesty King Charles II, was graciously pleased to command that the said Bones should be put into a Marble Urn, and deposited among the Reliques of the Royal Family in the Chapel of King Henry the Seventh, in Westminster Abbey.'⁴

¹ Sandford, *Genealogical History of the Kings of England* (1677), p. 402.

² In a copy of Yorke's *The Union of Honour* (1640) in the possession of Mr. Leslie W. Wegg there is the following manuscript note (p. 42 beneath the account of Edward V) in Knight's handwriting and signed by him: 'A^o 1674. In digging down a pair of stone staires leading from the Kings Lodgings to the chappel in the white tower ther were found the bones of two striplings in (as it seemed) a wooden chest w^{ch} upon the presumptions that they were the bones of this king and his brother Rich: D. of York, were by the command of K. Charles the 2d put into a marble Vrn and deposited amongst the R: Family in H: 7th Chappel in Westminster at my importunity. Jo. Knight.'

³ In a copy of 'a Catalogue and succession of the Kings . . . of England' which belonged to John Gibbon, Bluemantle, and is now at the College of Arms, is the following autograph note: 'Die Veneris July 17 Anno 1674 in digging some foundacons in ye Tower, were discovered ye bodies of Edw 5 and his Brother mured 1483. I my selfe handled ye Bones Especially ye Kings Skull. ye other wch. was lesser was Broken in ye digging. Johan Gybbon, Blewmantle.'

⁴ Wren in the *Parentalia* gives a similar account. He states that the bones were found 'about 10 feet deep in the ground . . . as the workmen were taking away the stairs, which led from the

With this we may compare another contemporary account quoted by Mr. Richard Davey in his *Tower of London*.¹ He writes: 'on the margin of one of the pages of a curious MS. on Heraldry inherited by the writer from

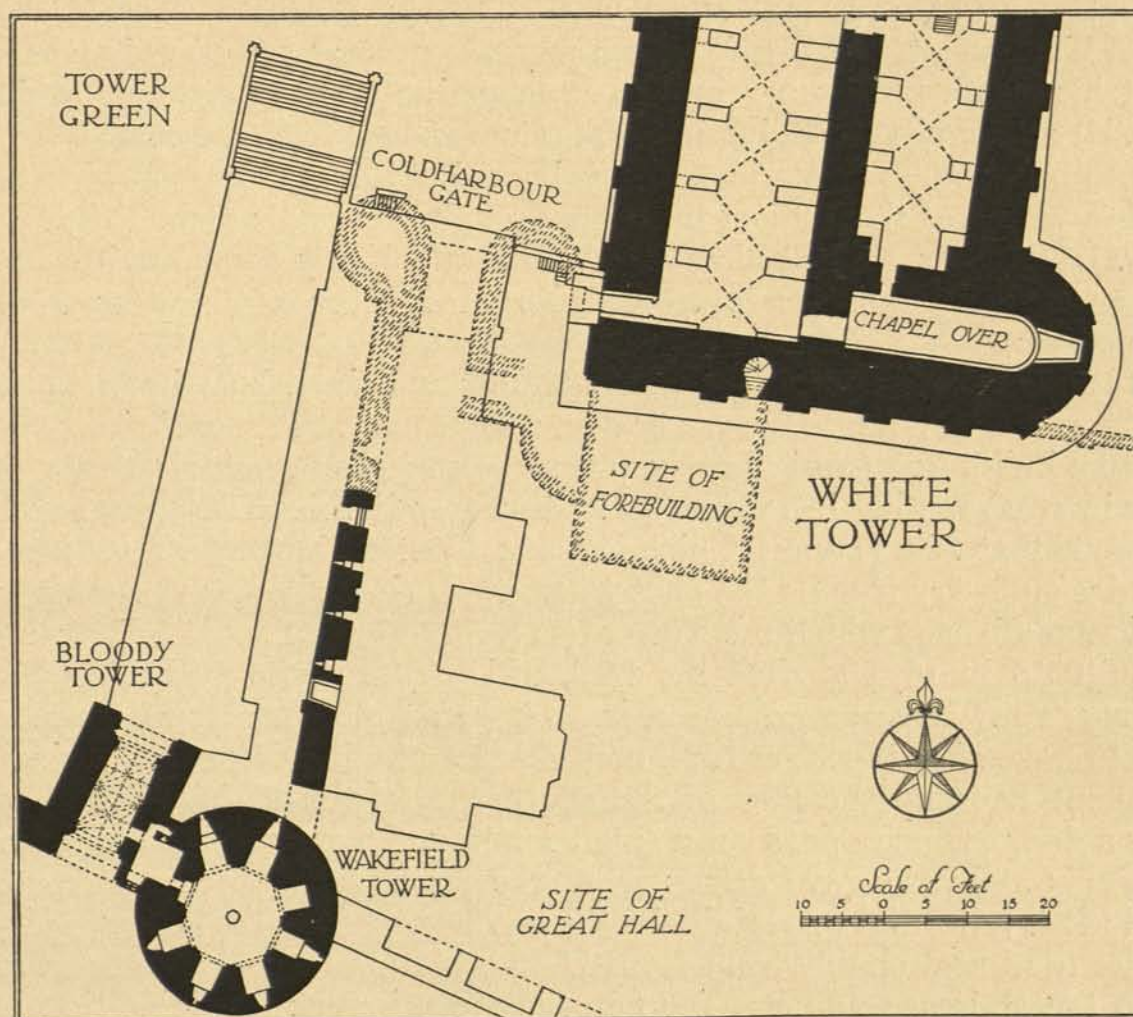


Fig. 1. Plan of part of the Tower of London, showing site of demolished forebuilding, etc.

his Grandfather,² the following note in an ancient handwriting appears: "This day I, standing by the opening, saw working men dig out of a stairway in the White Tower, the bones of those two Princes who were foully murdered by

royal Lodgings into the Chapel of the White-tower', p. 333. Kennett (*History of England*, 1719), i, 551 n., describing the finding of the bones, writes that 'when . . . great heaps of records of bills and answers lying in the Six Clarke's office were removed thence to be repositied in the white Tower and a new pair of stairs were making into the Chappel there, for the easier conveyance of them thither, the labourers in digging at the foot of the old stairs came to the bones of consumed Corps, cover'd with an heap of stones'.

¹ pp. 22-3.

² I have been unable to trace the present location of this manuscript.

Richard III . . . they were small bones, of lads in their teens and there were pieces of rag and velvet about them. . . . Being fully recognised to be the bones of those two Princes, they were carefully put aside in a stone coffin or coffer ”.

John Knight, principal surgeon to Charles II, from whom Sandford derived his account, was a well-known man whose career can easily be traced, and at his death he left a remarkable collection of Heraldic manuscripts in some sixty volumes to Caius College, Cambridge.¹ I have searched these without finding any references to the princes, but it is not improbable that the unknown writer of the note on the margin of the Heraldic manuscript quoted by Mr. Davey was Knight himself. At any rate if any formal written report on the discovery was made to Charles II it does not appear to be in existence.

It is not clear whether the bones were found in a hole in the staircase actually within the White Tower or somewhere beneath the stairs just outside the actual building. Lord De Ros (who became Lieutenant-Governor of the Tower in 1852) writing in 1866 states: ‘it was by Charles II’s orders, as tradition went, that Sir Thomas Chicheley, his Master General of the Ordnance, planted a mulberry tree on the spot where the Princes bodies were found ; but with a vandalism to which the Tower has been too often subjected, a staircase was built up in 1674 against the wall, which caused the rapid decay of the mulberry tree. There was, however, in 1853 an old Warder who well recollected to have seen the stump still embedded in the landing of the stairs.’²

About 14 ft. up the face of the south wall of the White Tower there is to-day a door³ which opens on a small landing of a now blocked spiral staircase. This staircase gave access from the forebuilding of the keep to the chapel of St. John, and was originally the private way from the King’s Lodgings. A tablet (dating probably from Lord De Ros’s tenure of office) is fixed on the wall of the staircase and has the following inscription: ‘the tradition of the Tower has always pointed out this as the Stair under which the bones of Edward the Vth and his brother were found in Charles the 2nd’s time and from whence they were removed to Westminster Abbey.’

The tradition is not entirely satisfactory for the staircase at this point is cut out of a solid eleventh-century wall, and it could hardly have provided an adequate place for burial. If we take all the contemporary accounts together

¹ Venn, *Alumni Cantabrigienses*. Cf. ‘Medical Court Roll’ by S. D. Clippingdale, M.D. (manuscript in the Royal College of Surgeons Library), etc.

² De Ros, *Tower of London*, p. 45.

³ The stairs which led to it were removed some years ago and it can now only be reached by a ladder. I am much indebted to Lt.-Col. W. F. O. Faviell, D.S.O., the Major and Resident Governor of the Tower, who kindly gave every facility to Professor Wright and myself to examine the actual place. See fig. 1, and illustration on p. 46 of De Ros, which shows the door and old stairway.

it is perhaps more reasonable to suppose that the bones were actually buried at the foot of the steps which then led up to the present door. It would appear that in 1674 the old stairs were done away with, and that the White Tower was cleared of 'all contiguous buildings'. The place of burial would thereby become open ground. 'In digging down' these foundations the children's bones might well have been found, as Sandford says, 'about ten feet in the ground', and might be said to be 'alte defossa in rudibus scalarum' (as is stated in the inscription on the monument in the abbey), and they would have been found sufficiently near to the stair in the south wall to be said to have been buried beneath it, and to enable a mulberry tree to have been planted to mark the spot.

However that may be, it would appear that the bones remained for a few months in the custody of Sir Thomas Chicheley.¹ On 18th February, 1675, the following warrant² was issued to Sir Christopher Wren, as Surveyor General:

A Marble Coffin
for two princes

These are to signifie his Maiesties
pleasure that you provide a white
Marble Coffin for the supposed
bodies of ye two Princes lately found in ye Tower of
London and that you cause the same to be intered in
Henry ye 7th Chappell in such convenient place as the
Deane of Westminster shall appoynt. And this shalbe yor
warrant. Given under my hand this 18th day of February
1674/5

To Sir Christopher Wren
Surveyor General of
His Majesties Workes

ARLINGTON

At the same time a further warrant was issued to the dean of Westminster³ informing him that Sir Christopher Wren had been desired 'to attend yor Lordshipp for yor Order and direction for a convenient place for ye Interment'. Sir Christopher Wren thereupon designed the existing monument (pl. 1, fig. 3), which was actually carried out by Joshua Marshall, the King's Master Mason.⁴ It was erected in 1678, and in the meanwhile the bones seem to have been

¹ Sir Winston Churchill in *Divi Britannici* (1675) writes 'within these very few weeks when some occasionally digging in the Tower . . . found the coffin, and in it the bones of both the Princes . . . which (I take it) are yet to be seen, or were very lately, in the custody of Sir Thomas Chicheley, the Master of the Ordnance'.

² P.R.O., Lord Chamberlain's Warrants, 1674-76¹, L.C. 5. 141. Cf. Wren's *Parentalia*, p. 333.

³ John Dolben, dean of Westminster and bishop of Rochester.

⁴ Cf. *Parentalia*, p. 333. P.R.O., Audit Accounts 2439/103-5.

temporarily interred in General Monck's vault nearby.¹ The inscription is as follows:

H. S S
Reliquiæ
EDWARDI Vti REGIS ANGLIÆ ET RICHARDI DVCIS
EBORACENSIS
HOS, FRATRES GERMANOS, TVRRE LONDIN^{si} CONCLVSOS
INIECTISQ CVLCITRIS SVFFOCATOS,
ABDITE ET INHONESTE TVMVLARI IVSSIT
PATRVVS RICHARDVS PERFIDVS REGNI PRÆDO
OSSA DESIDERATORVM, DIV ET MVLTVM QVÆSITA,
POST ANNOS CXC & I
SCALARVM IN RVDERIBVS (SCALÆ ISTÆ AD SACELLVM
TVRRIS ALBÆ NVPER DVCEBANT)
ALTE DEFOSSA, INDICIIS CERTISSIMIS sunt REPERTA
XVII DIE IVLII A^o. Dⁿⁱ. MDCLXXIII
CAROLVS II REX CLEMENTISSIMVS, ACERBAM SORTEM MISERATVS
INTER AVITA MONVMENA² PRINCIPIBVS INFELICISSIMIS.
IVSTA PERSOLVIT.
ANNO DOMⁱ 1678 ANNOQ REGNI SVI 30.³

We may now consider where the murder took place. A tradition at the Tower of London associates it with a room in the Bloody Tower.⁴ This tower was then known as the Garden Tower, and at that time had no particularly dismal associations. Indeed, with its outlook to the river and to the lieutenant's garden, it was no unlikely place for the princes to have been lodged. There is a further tradition that after the murder they were buried first under or near the Bloody Tower, in a place which is still pointed out, and that they were then removed by a priest and buried under the staircase in the White Tower beneath the place now marked by the tablet we have already mentioned. The supposition is that this was the nearest spot to consecrated ground which the priest could find where he could bury them secretly.

It may have been so; but it is important to bear in mind that the identification of the Bloody Tower as the scene of the murder rests only on a late tradition. The first reference to it appears to be in 1604, when, in an address of welcome to King James I, the chaplain of the tower, William Hubbocke, described it as the tower which 'our elders tearmed the Bloody Tower for the

¹ Dart, *Westminster Abbey*, i, 167.

² *sic*. The punctuation throughout is as it is on the Monument.

³ As designed by Wren the urn was surmounted by two palm leaves and a crown. The marks for these still remain.

⁴ De Ros, *Tower of London*, p. 44.

bloodshed, as they say, of those infant princes of Edward IV'.¹ We may, perhaps, remark that between 1483 and 1604 there were all too good reasons, apart from the princes, for changing the name of the Garden Tower and for associating it with deeds of blood.

More makes no attempt to identify the scene of the murder—he merely calls it a 'chamber', and he was evidently doubtful about the story of the priest, for he guards himself by adding 'as I haue heard' and 'thei say'.² On the other hand he states definitely, and apparently quoting from the murderers' confessions, that they were ordered 'to burye them at the stayre foote, metely depe in the grounde under a great heap of stones', and the important fact seems to be that it was in a situation exactly corresponding to this that the bones now in Westminster Abbey were found in the White Tower in 1674.

It is not easy to see how, if the princes were buried first at the foot of the Bloody Tower, they would have been found in 1674 at the foot of the White Tower in a position so closely corresponding to More's account of the first interment. Possibly the murder took place in the Bloody Tower and the bodies were then carried across to the foot of the White Tower for burial.

There is, however, a sentence in the very important contemporary manuscript—'De Occupatione regni Anglie per Riccardum tercium', written by Dominic Mancini and recently discovered in the Lille Municipal Library by Mr. C. A. J. Armstrong, Fellow of Hertford College, Oxford—which offers a more reasonable solution of the problem. Mancini obviously writes with authority on the events he records. He relates that at first the young king was treated with every mark of respect, but that after the execution of Hastings (13th June, 1483) his attendants were forbidden to see him, and he and his brother were moved to 'the more central and less accessible parts of the tower'. Each day they were seen less and less often behind the bars and windows, until at last they ceased to appear.³ Mancini himself had no doubt that they were murdered, although he was never able to obtain definite proof. But he states

¹ Nichols, *Progresses of King James I*, i, 326*.

² Hardyng has another story in his Chronicle: 'The very trueth could never yet be very wel and perfectly knowen, for some say that Kyng Richard caused the priest to take them up and close them in lead, and to put them in a coffyne full of holes hoked at the endes, with ij hokes of yron, and so to cast them into a place called the Blacke depes at the Thames mouth so that they should never rise up nor be sene agayne.' It shows at least the uncertainty and that several stories were current.

³ Mr. Armstrong, who is editing Mancini's Manuscript (the existence of which he made public in an article in *The Times* of May 26, 1934), has very kindly allowed me not only to see his transcript but to quote the relevant sentences which are as follows:—'Sed postquam Astinco amotus est; omnes familiares qui regulo inservierant ab eius accessu prohibiti sunt; Ipse cum fratre in penitiores ipsius turris edes reducti, rarius per cancellas et fenestras in dies conspici ceperunt; usque adoe ut penitus desierint apparere.' The Great Chronicle of London also states that 'afftyr this [the execution of Hastings] were the prince and the duke of York holdyn more streyghth' (f. ccvii).

that he had discussed the matter with several people who could not restrain their tears when speaking of the mystery of their disappearance.

We may perhaps conjecture that the young king was lodged at first in the Garden or 'Bloody' Tower. There on 16th June he was probably joined by the duke of York, and for the first week or two they were seen 'shooting and playing' in the garden—it will be remembered that one of the reasons which induced the queen to part with the duke of York was said to have been that his brother wanted a playfellow and needed 'desporte and recreacion'.¹ But on 26th June (after Dr. Shaw on 22nd June had openly preached at St. Paul's on the illegitimacy of the princes in the presence of Richard) Richard formally assumed the crown and Edward V's short reign came to an end. It would surely not be unnatural that the princes should have been then 'holden more streyghth' and should have been removed to the 'more central and less accessible parts of the Tower (in penitiores ipsius turris edes, i.e. the White Tower), where they were gradually less and less seen,² and where finally perhaps the murder actually took place. If this was really so, and if they were buried 'at the stayre foot' of the White Tower, where in fact the bones of two children of approximately the ages of the princes were found in 1674—one of whom, as Professor Wright suggests, had almost certainly (from the stain on the jaw) met with a violent end—then the story does appear to become a coherent whole.

On Thursday, 6th July, 1933, the urn in Henry VII's chapel was opened in the presence of the dean of Westminster (Dr. W. Foxley Norris), the Lord Moynihan, Sir Edward Knapp-Fisher (Chapter clerk), myself, Professor W. Wright, Mr. Aymer Vallance, F.S.A., the clerk of the works (Mr. W. Bishop), the dean's verger (Mr. G. C. Drake), and four of the Abbey staff. It was found that the bones filled an oblong cavity within the urn. It was at once apparent that they belonged to two human beings, for a fairly complete skull and a portion of another lay upon the top. Many bones were found to be missing, but this is accounted for by the fact, as stated in Sandford, that the bones at first were thrown away by the workmen and had subsequently to be recovered

There is apparently a slight confusion in dates. Hastings was executed on June 13, 1483, and it was not until June 16 that the duke of York joined his brother in the Tower. More, however, infers that the younger prince was already in the Tower at the time of Hastings' execution.

¹ If, as the Great Chronicle says, they were thus seen playing during the mayoralty of Sir Edmund Shaa (1482-3), the only possible dates are between June 16 and October 28, when his year of office came to an end. It may be remarked, too, that it would obviously be to Richard's advantage to allow them to be seen playing together and thus allay suspicion of his designs on the crown as long as he could.

² It is most remarkable that on June 28 John, Lord Howard was actually created duke of York by Richard.

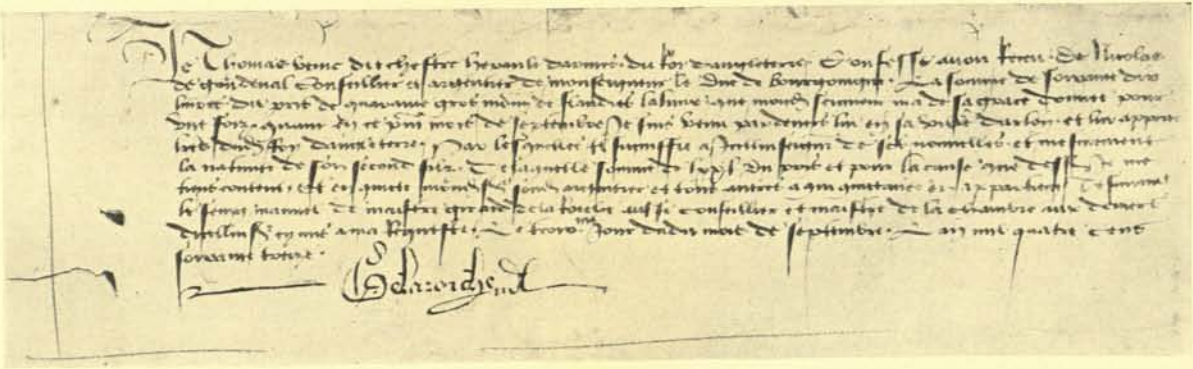


Fig. 1. Chester Herald's acknowledgement

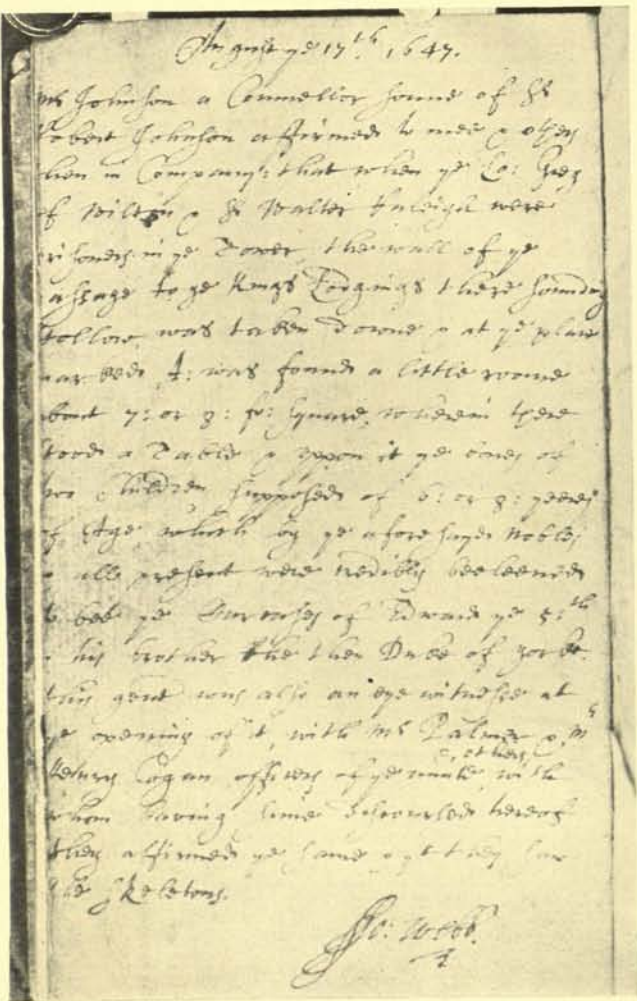


Fig. 2. Note in Miss Daniel's copy of More's
Historie... of Edward V



Fig. 3. The Urn in Henry VII's chapel, Westminster Abbey

from a heap of rubbish.¹ Among the dust at the bottom of the urn we found three much rusted nails, which may possibly have belonged to the original chest in which the bones were buried. No portion of rag, velvet or any other material was found. The bones were carefully lifted out and placed upon a table nearby. The chapel was closed to the public, and every facility was provided to enable Professor Wright to make a detailed examination.

On 11th July, the examination having been concluded and photographs having been taken, the bones of the two children were placed separately on the table and were wrapped in the finest lawn. The dean himself replaced the bones within the urn, together with a statement written on parchment recording what had been done.

The dean then read part of the Burial Service, and the urn was finally re-sealed in our presence.

L. E. T.

II

ANATOMICAL

It will be evident from Mr. Tanner's historical statement that the reason for opening the urn was to see if it contained bones which, on anatomical examination, would confirm the very definite statement in the epitaph—*ossa . . . indiciis certissimis sunt reperta*—that they were those of the princes. Were such confirmation forthcoming, a further question would present itself—could the ages of the princes at the time of their death be determined; were they, in short, alive or dead at the time of the battle of Bosworth?

An examination of the contents of the urn proved beyond all doubt that there were only two human beings represented: that the bones were those of children differing some two or three years in age as judged by the length of their bones, and that the elder child was still in the puberty period, since the elements forming the sockets of the shoulder and hip joints showed no signs of union.

An attempt to fix the age of the elder child more precisely was rewarded

¹ Others were probably given away by Sir Thomas Chicheley, for Hearne (*Collections*, x, 86, Oxford Hist. Soc.) has the following note under Jan. 10, 1728/9: 'To enquire of Mr. Whiteside about some of the bones of Ed. V and of his brother Richard Duke of York, found in the Tower of London, temp. Car. II, part whereof were sent (as Dr. Plot in his MSS. memoirs says) by Mr. Ashmole to his Museum at Oxford'. The next day Hearne called at the Ashmolean 'on purpose to see the bones of Edw. V and his brother Richard D. of York. Mr. Whiteside told me they had somewhere or other such bones very small, particularly the finger bones, and that Sandford had mentioned them as being there in his *Gen. History*, but Mr. Whiteside did not produce them.' The present Keeper of the Ashmolean, Mr. E. T. Leeds, F.S.A., kindly made every effort to trace them for me, but like his predecessor, Mr. Whiteside, was unable to produce them when I called on purpose to see them!

by the discovery of two bones which furnished the necessary evidence—an axis or second cervical vertebra and a first sacral vertebra.

The axis was without the apical part of its odontoid process, a state which makes it possible to say with every confidence that it belonged to a child who had not yet attained the age of thirteen. The bone undoubtedly belonged to the elder child: this conclusion was based on the following observations—there were two atlases or first cervical vertebrae found in the urn, one in an almost perfect state of preservation, the other in fragments; when corresponding parts of the two atlases were measured it was found that the more complete one was the larger, and belonged therefore to the elder child. It seemed in consequence reasonable to infer that the well-preserved second cervical vertebra belonged to the same skeleton as the well-preserved first cervical vertebra. Any doubt on the matter which there may have been was removed when it was found not only that the two bones—the complete atlas and axis—fitted perfectly together, but that in addition there was a dark brown stain which was common to both bones, and continuous from one to the other.

Corroborative evidence of some value as to the correctness of the estimate of the age of the elder child was obtained from the first sacral vertebra which almost certainly belonged to his skeleton, since his two ilia—bones with which the sacrum articulates—were present, whereas only a portion of one ilium of the younger child's skeleton was found. The laminae of this vertebra were still half an inch or so apart, indicating a probable age of less than thirteen.

Of all methods of determining the age of children none is more helpful and reliable than the examination of the teeth. So impressed was I by the importance of the method that I at once sought the assistance of one of the leading authorities on the dentition of children, Dr. George Northcroft, an ex-President of the British Society of Orthodontics and the immediate ex-President of the British Dental Association. Dr. Northcroft with characteristic generosity placed his time and knowledge, based on a long and wide experience, freely at my service, and it is largely, I might almost say entirely, due to his invaluable help that I am able to write on this matter with great confidence.

To present the dental evidence as clearly as possible I give it in a tabulated form, prefacing my remarks with the statement that only the right half of the lower jaw of the younger child, whom I shall now presume to call Richard, was present, and that although both jaws of the elder child, Edward, were present in their entirety, they contained no teeth. Fortunately the empty sockets of the teeth in all cases were in good condition, so that it was not difficult to determine the state of development of the missing teeth.

The teeth of Richard, duke of York:

Incisors. Completely formed.

Canine. Unerupted, pulp cavity open, root about two-thirds formed.

First premolar. Unerupted, pulp cavity open, root about half formed.

Second premolar. Unerupted, only its crown formed, and only discovered by radiography: it lay in its bony crypt under bone of considerable thickness and density.

First molar. Erupted, completely formed, as shown by the sockets for its roots.

Second molar. Found loose in the urn, crown only formed, no sign of any root formation.

The canine and first premolar teeth could be seen in their crypts. Just behind the crown of the unerupted canine tooth the socket of the anterior root of the first deciduous molar could be seen, proving that this tooth had either been in part present at the time of death, or had only recently been lost.

These data taken separately and together, after making all due allowance for deviation from the normal, permit of the determination of Richard's age as being about mid-way between nine and eleven.

The teeth of Edward V, as judged by the state of their sockets:

Incisors. Completely formed.

Canines. Upper or maxillary—not completely formed.

Lower or mandibular—completely formed.

First premolars. Upper or maxillary—not completely formed.

Lower or mandibular—completely formed.

Second premolars. Upper or maxillary—both teeth entirely absent.

Lower or mandibular—not completely formed.

First molars. Completely formed.

Second molars. Not completely formed.

Third molars. The crown of the upper or maxillary tooth of the left side about one-third formed: it was found loose in the urn. No trace of the tooth of the right side.

Lower—no trace of this on either side as proved by radiography.

The second upper or maxillary deciduous molars had either been in part present at the time of death, or had only recently been lost, seeing that the sockets of their palatine roots were still clearly discernible. The sockets of the posterior roots of the corresponding lower molars were also apparent.

These data, taken separately and together, permit of Edward's age being determined as somewhere between the ages of twelve and thirteen.

In seeking to identify the remains, evidence of consanguinity obviously has considerable weight. Such evidence, drawn as it must be solely from the examination of the bones, is naturally difficult to obtain. I would refer, how-

ever, to two features of no small significance—the presence of Wormian bones of unusual size and of almost identical shape in the lambdoid sutures of both Edward's and Richard's crania, and the absence of the upper second premolars in Edward and of the lower second deciduous molar in Richard. Although the absence of the last-named tooth is excessively rare,¹ and although absence would be expected to be associated with a forward movement of the first permanent molar, a movement of which there is no indication, both Dr. Northcroft and I are of opinion, after most careful examination, that Richard had never had a deciduous second molar; there was no trace of any socket, while the alveolar margin instead of being flattened, as would be expected if any tooth had been present, was rounded and somewhat compressed. If the tooth had been present it must, in view of the appearance of the alveolar margin, have been lost at an early age. The retention of certain roots of Edward's second upper and lower milk molars, and of Richard's first milk molar, do not suggest any tendency in either child to early loss of their milk dentition. If we assume that the second deciduous molar was absent in Richard we would have an instance, not only of tooth-suppression in both children, but of tooth-suppression occurring in the same regional plane.

There is undoubted evidence of Edward having suffered from extensive disease affecting almost equally both sides of the lower jaw, originating in or around the molar teeth, from the sockets of which the inter-radicular septa had been entirely absorbed. On the left side the disease had spread to such an extent that it had destroyed the inter-dental septum between the first and second molar teeth. The disease was of a chronic nature and could not fail to have affected his general health. It may well have accounted, in part at least, for the depression from which he is said to have suffered, for the relief of which his mother is said to have agreed to part with her younger son.

A remarkable feature of Edward's facial skeleton was an extensive stain reaching from just below the orbits to the angles of the lower jaw. The stain was of a distinctly blood-red colour above, of a dirty brown colour below, and was obviously, as shown by the gradual fading away of its margins, of fluid origin. I have no doubt it was a blood stain.² Its presence, together with the complete separation of the facial skeleton, lends support to the traditional account of the manner of the brothers' death—suffocated 'under feather bed and pillows, kept down by force hard unto their mouths'.

¹ Cases of absence of deciduous molars are recorded in Colyer and Sprawson's *Dental Surgery and Pathology*.

² I endeavoured to obtain corroborative evidence of its nature by scraping the parts but failed to obtain more than a little powdered bone which, subjected to spectroscopic examination, gave no results.

Suffocation by such means is well known to be associated with intense congestion of the face. When Humphrey, duke of Gloucester, met his death in this way at Bury St. Edmunds, and his body was brought into the presence of Henry VI, Shakespeare puts into the mouth of Warwick the following lines: 'See how the blood is settled in his face', and a little later, 'But see his face is black and full of blood'.

The evidence that the bones in the urn are those of the princes is in my judgement as conclusive as could be desired, and definitely more conclusive than could, considering everything, have reasonably been expected. Further, their ages were such that I can say with complete confidence that their death occurred during the reign of their usurping uncle, Richard III.

As to the appearance of the princes they were in height probably 4 ft. 10 in. and 4 ft. 6½ in. From the size of such bones as the collar bones, shoulder blades, and hip bones, we may conclude that they were of slender form. An examination of their mouths would show Edward to have all his teeth in position except his second maxillary pre-molars, their places possibly being taken by the partially absorbed second deciduous molars; Richard to have a distinct gap between his right lower lateral incisor and his first molar, with possibly the partially absorbed canine and first deciduous molar occupying the interval. The gums of Edward in the lower molar region would be inflamed, swollen, and septic, and be no doubt associated with discomfort and irritability.

As to what happened after their death no one now can say, but I imagine that when placed in the elm chest in which they were found, Edward lay at the bottom on his back with possibly a slight tilt to his left, that Richard lay above him face to face, and that when the chest was discovered in the seventeenth century the workmen broke into it from above and near its middle. I am led to these conclusions from the fact that much more of Edward's skeleton is present than of Richard's, since presumably lying deeper it was less disturbed, and from the fact that the extreme upper and lower portions (viz. the head and feet) of Edward's skeleton are so well preserved. The singular fact that of the atypical ribs no less than six should have been found, and that of these six, three were of the left side and belonged to Edward's skeleton, three of the right side and belonged to Richard's, and that similarly only the left clavicle of Edward and the right clavicle of Richard were present, strongly suggests that the left shoulder of Edward must have been in close contact with the right shoulder of Richard, as would have been the case had they lain face to face.

The chest containing the bodies was, so I believe, buried in a hole which, with the accumulation of surface soil which naturally occurs during the

centuries, would gradually have become deeper and deeper, particularly as there is reason to think that the surface received a considerable amount of kitchen refuse. It is difficult otherwise to explain why, when the chest was found, it was said to have been taken from a deep hole, 'alte defossa', and why the urn should have contained, in addition to the human bones, a large variety of other bones such as those of fish, duck, chicken, rabbit, sheep, pig, and ox.¹ These animal bones were presumably picked up with the scattered human bones in the seventeenth century and taken to the abbey.

The bones in the urn were arranged in no particular order, but on the whole the human cranial bones were uppermost. With the bones were a few rusted iron nails, two small pieces of sandstone, a peat-stained piece of wood, a few flakes of marble from the marble of the urn, and a number of irregularly shaped pieces of lead evidently from the sealing of the urn.

After the examination of the contents of the urn had been completed and the interior of the urn cleaned, the human bones wrapped in white lawn were replaced—first the bones of Richard, then the limb and body bones of Edward, and finally the bones of his skull. The cover of the urn was then replaced and the urn was again sealed.

Many years ago a Latin poet, meditating on the strange and varied fortunes of the dead, reflected that while 'Licinus a freedman sleeps in a marble tomb, Cato had a small one, Pompey none'. Where, he asks, are the gods? To which in Delphic fashion may we not reply that while the bones of Richard III have long since disappeared, trampled into common clay, those of the princes freed from all undignified associations rest secure, in the company of those of their mighty ancestors, at the very heart of the national shrine?

¹ I am indebted to Dr. Hopwood of the Natural History Museum for their identification.

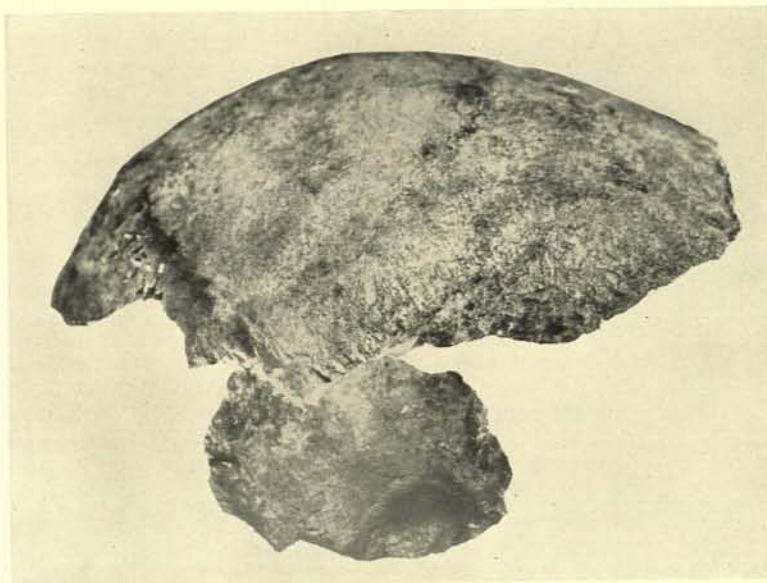


Fig. 1. 'Richard, Duke of York.' Part of the right side of the cranial vault, *Norma lateralis*



Fig. 2. 'Edward V.' Cranial vault *Norma lateralis*



Fig. 3. 'Edward V.' Cranium *Norma occipitalis*, showing bilateral Wormian bones in lambdoid suture

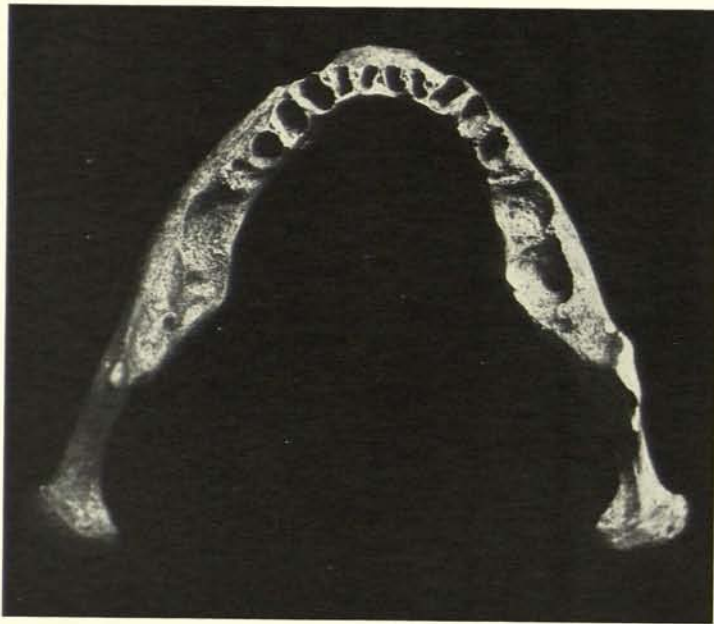


Fig. 1. 'Edward V.' Lower jaw, showing (a) effects of disease in the region of the molar teeth, (b) the socket of the posterior root of the second deciduous molar on each side, and (c) an aperture on each side behind the socket of the second permanent molar suggesting the presence of an underlying tooth, a view negated by the radiographical examination

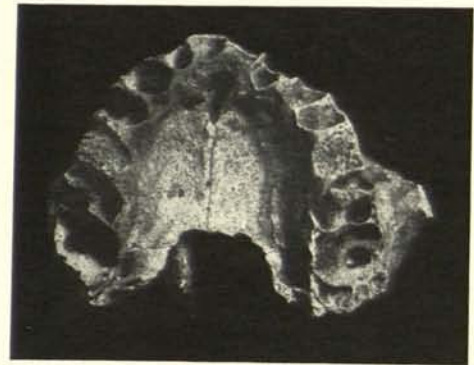


Fig. 2. 'Edward V.' Upper jaw showing on either side an empty space between sockets of first premolar and first molar teeth where second premolar is absent. The socket of the palatal root of second deciduous molar is seen on right side. The incomplete sockets for roots of second molar teeth are also shown

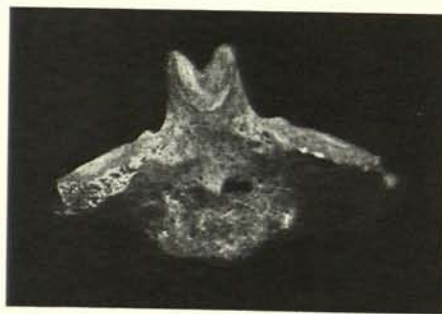


Fig. 3. 'Edward V.' Axis, or second cervical vertebra showing absence of apical part of odontoid process



Fig. 4. 'Richard, Duke of York.' Part of right half of lower jaw, showing crown of second molar in position



Fig. 5. 'Richard, Duke of York.' Part of right half of lower jaw, showing (a) socket of anterior root of first deciduous molar, (b) ridge between crown of first premolar and socket of first permanent molar, (c) smooth socket for crown of second permanent molar

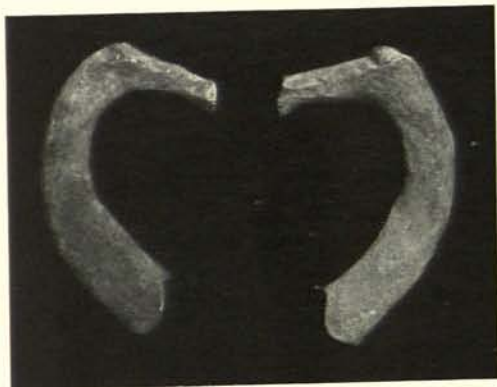


Fig. 1. Left first rib of 'Edward V', and right first rib of 'Richard, Duke of York', side by side for comparison



Fig. 2. Left second rib of 'Edward V', and right second rib of 'Richard, Duke of York', side by side for comparison

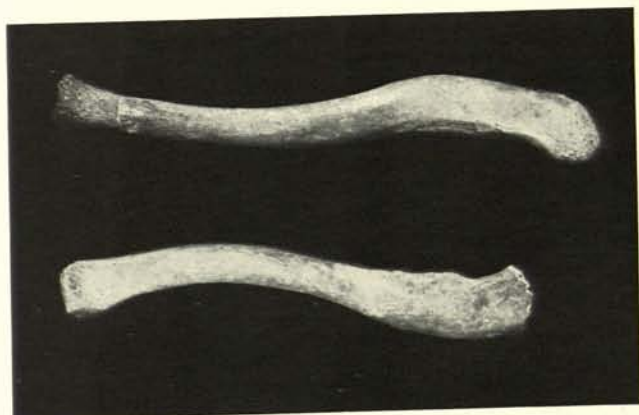


Fig. 3. Left clavicle of 'Edward V', and right clavicle of 'Richard, Duke of York', side by side for comparison

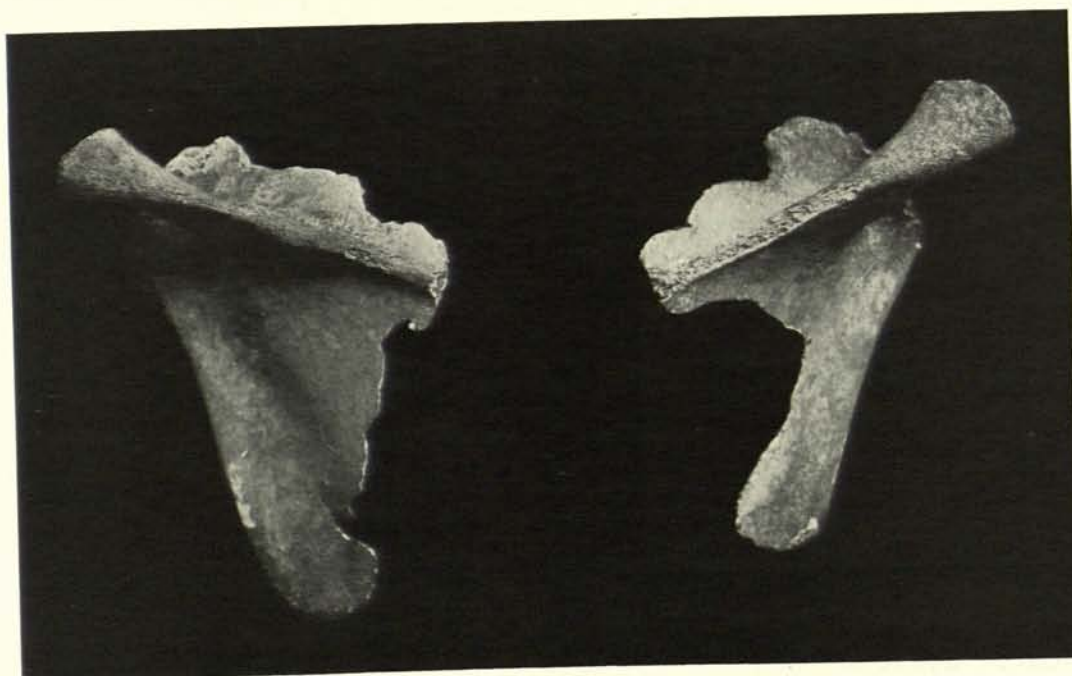


Fig. 4. Scapulae of 'Edward V'

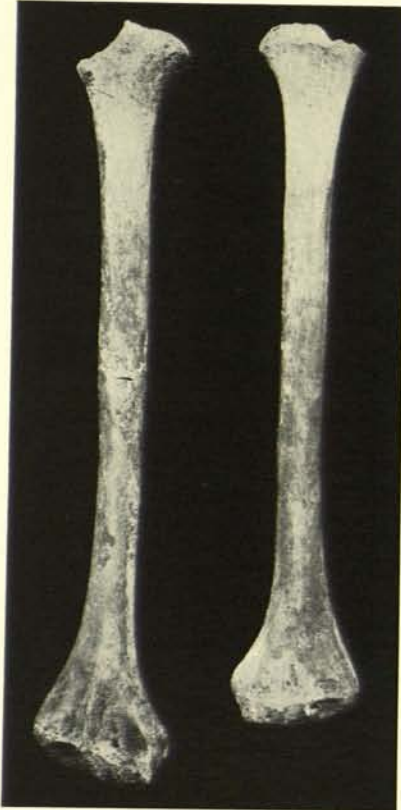


Fig. 1. Humeri of 'Edward V' and 'Richard Duke of York', side by side for comparison

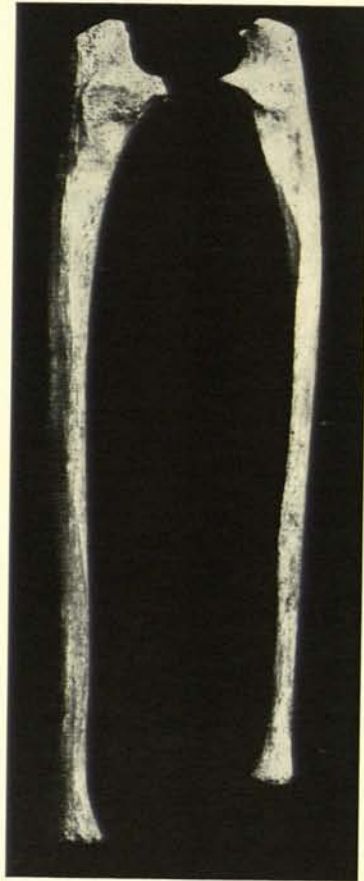


Fig. 2. Ulnae of 'Edward V' and 'Richard Duke of York', side by side for comparison

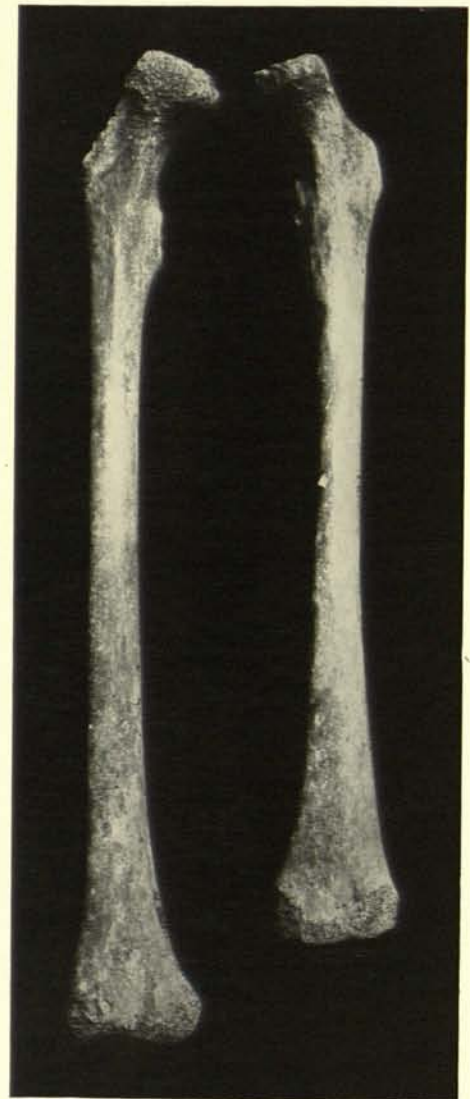


Fig. 3. Femora of 'Edward V', and 'Richard, Duke of York', side by side for comparison

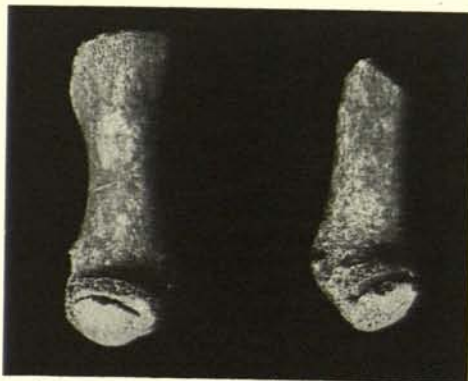


Fig. 4. First metatarsals of 'Edward V'



Fig. 5. Fifth metatarsals of 'Edward V', and 'Richard, Duke of York', side by side for comparison

RELIQUIAE

'EDWARD V'

Skull.

The cranial vault complete from the supra-orbital region to the posterior margin of the foramen magnum (opisthion) and from the middle line to the parieto-squamous suture.

The cranial base complete except in the ethmoidal region but its various parts—sphenoidal, temporal and occipital—separate.

The upper facial skeleton complete except for the nasal bones and for the bones forming the adjoining regions of the orbits: the bones still articulated with each other but separate from the remainder of the skull.

The lower jaw in two pieces.

Vertebral Column.

The first cervical vertebra or atlas.

The second cervical vertebra or axis.

The first sacral vertebra.

Thoracic Skeleton.

The first rib of the left side.

The second rib of the left side—incomplete.

The eleventh rib of the left side.

Bones of the Upper Limb.

The clavicle of the left side.

The scapulae of both sides.

The humeri of both sides.

The radius of the right side—upper part.

The radius of the left side—lower part.

The ulna of the right side.

Bones of the Lower Limb.

The ilia of both sides.

The ischium of the right side.

The femora of both sides.

The tibiae of both sides.

The fibulae of both sides.

The tarsus of both sides.

The metatarsus of both sides.

'RICHARD DUKE OF YORK'

The cranial vault incomplete and in fragments, the largest parts being the frontal bone in two pieces, and the parietal bone of the right side. A trace of the metopic suture still apparent at its lower end.

The cranial base only represented by the temporal bone of the right side and fragments of other bones.

Part of the right half of the lower jaw.

The first cervical vertebra or atlas in fragments.

The first rib of the right side.

The second rib of the right side—incomplete.

The eleventh rib of the right side.

The clavicle of the right side.

The glenoid part of the left scapula.

The humeri of both sides.

The radius of the right side—upper part.

The radius of the left side.

The ulna of the right side in fragments.

The ulna of the left side.

Part of one ilium.

The femora of both sides.

The tibiae of both sides.

The fibulae of both sides.

Parts of the tarsi—the larger bones.

Parts of the metatarsi.

The epiphyses of the long bones of the limbs were well represented but in no case had fusion with the diaphyses occurred.

RECENT INVESTIGATIONS REGARDING THE

BONES OF WHICH THE EXACT IDENTIFICATION IS UNCERTAIN

Vertebral Column.

Fragments of various vertebrae including two lower cervical, two mid-thoracic, the last thoracic, and three lumbar of which one was the fifth: the lines of union of the three primary parts of the vertebrae still apparent: probably most, if not all of them, formed part of the skeleton of the king seeing that his skeleton and particularly certain identifiable parts of his vertebral column, viz. the atlas, axis, and first sacral vertebra are so much better preserved than the corresponding parts of Richard's skeleton.

Thoracic Skeleton.

Fragments of a number of ribs: two long ribs, almost complete, had a chordal measurement across their arches of 193 mm. and 179 mm. respectively: they were both of the left side: probably they were the seventh and eighth ribs and formed with the mid-thoracic vertebrae already mentioned part of the skeleton of the king.

Bones of the Upper and Lower Limbs.

Of the twenty bones constituting the metacarpi only one—a third—could be definitely identified. A number of fragmentary phalanges mainly those of the toes, but including two of the fingers.

ADDITIONAL OBSERVATIONS

Skull.

The small wings of the sphenoid of Edward's skull were united in the middle line forming a *jugum sphenoidale* which was incompletely fused with the underlying portion of the body of the sphenoid (presphenoid). The sphenoturbinate bones were fused with the sphenoid, and the sphenoidal sinuses were well developed.

Owing to the detachment of the upper facial skeleton it was possible to obtain a good view of the maxillary antra, the left being considerably larger than the right. The right inferior turbinate bone was in an almost perfect state of preservation and was still firmly articulated with the corresponding maxilla.

The squamo-zygomatic portion of the glenoid cavity of the temporal bones was unusually deep, particularly on the right side—a condition which may possibly be attributed to the dental disease from which he suffered, disease which must, I imagine, have entailed irregular movement at the temporo-mandibular joints.

The left half of the interior of Edward's cranium was stained a dirty brown colour suggesting that in the chest in which he was originally placed he lay with an inclination to the left—a theory which receives some confirmation from the fact that somewhat more of the left side of his skeleton than of his right is preserved.

It will be noticed that Edward's skeleton is much better preserved than Richard's: this statement applies particularly to the skull, the vertebral column, and the bones of the feet. In the case of Richard the right parts of the skull and trunk are better preserved than the left. The absence from both skeletons of the sterna, patellae, and scaphoid bones of the tarsus is probably attributable to their cancellous structure and in the case of the last two to their relatively small size. The general absence of carpi and metacarpi may be in part at any rate similarly explained.

CONDITION OF THE BONES

While as a general rule the bones were dry and of a light brown colour, being obviously largely if not entirely destitute of organic matter, the single metacarpal bone and to a less degree the two phalanges of the fingers were exceptional in being of an ivory-white colour suggesting that a certain



Fig. 1. Skiagram of the right part of the lower jaw of 'Richard, Duke of York', showing from left to right the second premolar, first premolar, and canine teeth



Fig. 2. 'Edward V.' Skiagram of the alveolar part of the left upper jaw in the region of the missing second premolar



Fig. 3. 'Edward V.' Skiagram of the alveolar part of the right upper jaw in the region of the missing second premolar



Fig. 4. Skiagram of the mandible of 'Edward V' in the region of the angle (right)



Fig. 5. Skiagram of the mandible of 'Edward V' in the region of the angle (left)

amount of organic matter was still present. Such a difference may be attributable to the three bones in question having been in some way protected from the more complete desiccation which the other bones had undergone. If, as I conjecture, the two bodies lay face to face with the hands folded between them the conditions necessary for the more perfect preservation of the three bones may have been present.

MEASUREMENTS

'EDWARD V'		'RICHARD DUKE OF YORK'	
<i>Cranium.</i>			
Ophryo-inial length	173 mm.		
Biparietal width	127 mm.		
Wormian bone at bregma	27 x 20 mm.		
Wormian bones symmetrical in shape, size, and position in lambdoid sutures, maximum diameter	34 mm.	Wormian bone broken, but fitting into lambdoid suture on the right side; approximately of the same shape and size as those in Edward's cranium.	
<i>Atlas.¹</i>			
Width of vertebrarterial groove	9 mm.		7 mm.
Transverse diameter of inferior facet	16 mm.		13 mm.
Antero-posterior diameter of inferior facet	20 mm.		18 mm.
<i>First Rib.</i>			
Chordal length across arch	58 mm.		55 mm.
<i>Eleventh Rib.</i>			
Chordal length across arch	153 mm.		146 mm.
<i>Clavicle.</i>			
Length without epiphysis	113 mm.		96 mm. +
<i>Humerus.</i>			
Length without epiphyses	242 mm.		222 mm.
<i>Ulna.</i>			
Length without epiphyses	195 mm.		182 mm.
<i>Femur.</i>			
Length from great trochanter to articular surface of lower epiphysis	383 mm.		345 mm.
<i>Tibia.</i>			
Length including epiphyses	306 mm.		274 mm.
<i>Astragalus and Calcaneum.</i>			
Vertical height with the two bones in their normal position	66 mm.		60 mm.

¹ Owing to fragmentation of Richard's atlas, only certain parts were available for comparison.

Particular importance attaches to the measurements of the bones of the lower limb since they afford valuable evidence as to stature. If to the above measurements we make an allowance for Edward of 14 mm. and for Richard of 12 mm. in respect of cartilages and of soft parts at the heel, we arrive at an estimate for the length of Edward's leg measured from the top of the great trochanter to the sole of the foot of 769 mm. and of Richard's of 691 mm. According to figures based on many measurements, given in Rudolph Martin's *Lehrbuch der Anthropologie*, the proportion which the length of the lower limb as measured bears to stature is at the age of 13, 52 per cent., at the age of 10, 50 per cent. Using these figures I estimate Edward's stature to have been approximately 4 ft. 10 in. and Richard's 4 ft. 6½ in. Aware of the possibility of individual and racial variation, I still think it probable that the margin of error is extremely small.

The skiagrams (pl. vi) were taken for me by Dr. George Northcroft, to whom I am greatly indebted.

I am also indebted to Mr. Henry George, a member of the staff of the Royal College of Surgeons, for the other photographs (pls. II-V); these were taken under great difficulties since it was not possible to remove the bones from the chapel.

W. W.

III

SUMMARY

We are now in a position to sum up very briefly the results of this investigation:

(1) On the historical side there is at least a reasonable probability that the traditional story of the murder, as told by More, is in its main outlines true. It has further been shown that the bones were in fact found in a position at the Tower which approximates to the place where the princes were supposed to have been buried.

(2) The bones which were found in the Tower in 1674, and now rest in the urn in Westminster Abbey, have been definitely proved to be those of two children.

(3) Professor Wright, as a result of his anatomical examination, has been able to trace evidence of consanguinity with features 'of no small significance' in the bones and jaws of these two children.¹

(4) Professor Wright has drawn attention to a red stain across the facial bones of the elder child which, he had no doubt, was a blood stain, and was probably caused by suffocation.² One of these children, therefore, probably died a violent death.³ The princes were traditionally said to have been smothered with a feather bed and pillows.⁴

(5) Professor Wright has been able to show that the age of the elder child was 'somewhere between the ages of twelve and thirteen'.⁵

¹ pp. 17-18.

² p. 18.

³ There was nothing to suggest how the younger child met his death.

⁴ p. 7.

⁵ pp. 15, 17.

There is no doubt that the age of King Edward V, at the presumed date of the murder, was twelve years and nine months old.¹

(6) Professor Wright has been able to show that the age of the younger child was 'about mid-way between nine and eleven'.²

Working independently on the historical evidence, I came to the conclusion that the hitherto disputed age of Richard, duke of York, at the presumed date of the murder, was 'within a few days of his tenth birthday'.³

It follows from the above that if these bones are really those of the princes, and Professor Wright concludes that not only is there nothing from a scientific point of view against it, but that the evidence is 'definitely more conclusive than could, considering everything, have reasonably been expected',⁴ then we can say with confidence that by no possibility could either, or both, have been still alive on the 22nd August 1485, the date of Henry VII's accession.

L. E. T.

¹ p. 7.

² p. 17.

³ p. 8.

⁴ p. 19.

APPENDIX

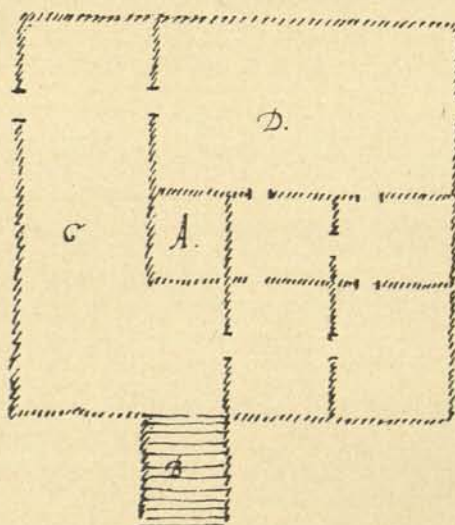
We may note two occasions prior to 1674 when bones were found in the Tower and were thought to be those of either one or both of the princes.

Sir George Buck (d. 1623), in his *History of the Life and Reign of Richard III*, first issued in 1646, mentions 'certaine bones like to the bones of a Child being found lately in a high desolate Turret [in the Tower of London], supposed to be the bones of one of these Princes; others are of opinion it was the carcase of an Ape kept in the Tower'. He adds that the turret was 'a vast and damned place for the hight, and hard accesse, no body in many yeares looking into it'.

The other occasion was far more interesting and curious. The only record of it appears to be a MS. note on the flyleaf of a copy of *The Historie of the Pitiful Life . . . of Edward V*, by Sir Thomas More published in 1641.¹ It is as follows:

'August ye 17th 1647. Mr Johnson a Counsellor sonne of Sr Robert Johnson affirmed to mee and others when in Company that when ye Lo. Grey of Wilton and Sr Walter Raleigh were prisoners in ye Tower, the wall of ye passage to ye Kings Lodgings there sounding hollow was taken downe and at ye place marked A was found a little roome about 7 or 8 fo. square, wherein there stood a Table and uppon it ye bones of two Children supposed of 6 or 8 yeeres of Age which by ye aforesayd noble and all present were credibly beeleeved to bee ye Carcasses of Edward ye 5th and his brother the then Duke of Yorke. This gent was also an eyewitnesse at ye opening of it, with Mr Palmer and Mr Henry Cogan, officers of ye minte and others with whom having since discoursed hereof they affirmed ye same and yt they saw the Skeletons. Jo. Webb.'

On the opposite page of the book is a neat little plan of the King's Lodgings:



- A. The 'little roome'.
- B. The Stayres leading out of Cole Harbour to ye Kings Lodgings.
- C. Passage to ye Kings Lodgings.
- D. Ye Guard Chamber.

¹ In the possession of Miss Gwladys E. Daniel, who has kindly allowed me to examine it and have the entry photographed (pl. 1, fig. 2).

II.—*On a Picture commemorative of the Gunpowder Plot, recently discovered at New College, Oxford.* By L. G. WICKHAM LEGG, Esq., M.A.

Read 18th January 1934

THE picture which is the subject of this paper is a canvas measuring 3 ft. 4½ in. in height and 2 ft. 8½ in. in width, now enclosed within a plain narrow gilt frame, which used until recently to hang behind the green baize door of the Bursary at New College, Oxford, and now is hung in the room there known as the Chequer. It was so completely blackened by time that some sixty years ago Warden Sewell attributed it to Richard Haydocke; but, as we shall see, Haydocke was the donor rather than the artist. Recently, even the words 'Ric. Haydocke' upon which the Warden had based his inference had become invisible, and indeed the only judgement that could safely be passed upon the canvas was that it was a painting. Some frequenters of the Bursary never even noticed its existence; but the more observant would, after one glance, abandon the attempt to solve its riddle. Nor would any attention have been paid to it, had it not been that, on the Bursary being redecorated, Mr. Albert Rutherston suggested that the picture might be cleaned, and so it has come about that the skill of Mr. B. Comfort of Woodstock has revealed a curious commemoration of the Gunpowder Plot, painted in 1630, the semi-jubilee of the conspiracy, by the hands, as would seem probable, of John Percivall of Salisbury.

Apart from the artistic merits of the picture, it will be seen that the general design is that of a triumphal arch through which Justice is passing. The arch is decorated with four Corinthian pilasters, with niches and metopes above, while upon the top are tall pyramids mounted on balls, which will remind lovers of books and of silver plate of a favourite design of those days. In the niches, and indeed all over the arch, there are portrayed persons and scenes connected with the conspiracy, to which are attached explanatory texts, betraying some ingenuity both in selection and arrangement.

The picture is divided into three horizontal sections. In the lowest, that below the cornice of the arch, we see the triumph of Justice over the wicked; above that is the Royal Family whose destruction has been averted; while above the arch we see the Almighty whose providence has preserved the Royal Family and brought the conspirators to justice. We will now examine the picture in detail.

In the lowest of the three sections, displaying the triumph of Justice, there appears under the vaulted arch, upon which are placed the signs of the zodiac from Cancer to Capricornus, with Libra blazing at the top in special and appropriate effulgence, the figure of Justice, crowned and robed in scarlet, with a sword in her right hand and an olive branch in her left, mounted upon a chariot of gold, drawn by a bull and a lion. Under the wheels of the chariot (which display upon their tires the words *Pone illos sicut rotam*¹) are crushed the bleeding limbs of the quartered conspirators, who *Disperierunt et facti sunt ut stercus terrae*²; while the qualities of justice are proclaimed in the beasts that draw her chariot: *Ad iram tardus*³ is the bull; *Mihi vindicta*⁴ is the claim of the lion fully equipped with teeth and claws. And, on each side of the arch, the impartiality of Justice is proclaimed: *Neque ad dextram: neque ad sinistram*.

Each pier supporting the arch is adorned with a niche surmounted by a metope devoted to the leading features of the conspiracy; namely, the destruction of the Parliament and the abduction of the Lady Elizabeth in order to proclaim her queen. So on the left, underneath a metope of the Parliament, we have a dark and cavernous scene portrayed, in which are barely visible a lantern dimly burning and some human figures. The words GVIDO FAVX below, and the watchful eye of Providence, which is a common, indeed a usual *motif* in engravings connected with the plot, show us beyond the shadow of doubt that the niche represents the cellars of the Parliament house. Our guess would be confirmed by the words on the scroll attached to the eye of Providence: *pulvere sine dubio tormentario*, a translation of the words used by the king when shown the letter to Lord Monteaule. Here, then, being the cellars, it is natural that the metope should represent what was above the cellars, namely the Parliament, and consequently we see a picture of the king in Parliament, with the lords, judges, and commons before him and the great officers of state behind the throne. The treatment is entirely conventional, and does not call for further remark.

This contrast between dealings transacted in obscurity and events in daylight is repeated on the other pier of the arch. Here the niche, round the arch of which are written the words *super populum malignaverunt consilium*,⁵ shows us the conspirators seated at a table on which is placed a candle (*fiat mensa eorum in laqueum ipsis*⁶), and above hangs, like the sword of Damocles, the

¹ Ps. lxxxiii. 14. This is the prayer-book numbering. The designer who gives the references generally uses this, but occasionally lapses into that of the Vulgate.

² Ps. lxxxii. 11 (Vulgate numbering).

³ Iac. i. 19.

⁴ The reference given is 'Ro. 13. 19,' an error; it should be xii. 19.

⁵ Ps. lxxxiii. 4.

⁶ Ps. lxix. 23 (the Vulgate text is *Fiat mensa eorum coram ipsis in laqueum*).

letter to Lord Monteagle, with a red seal. But the conspirators' fate is sealed; for on the right-hand side of the niche an angel, unseen by them, points the finger of scorn: *Dominus subsannabit eos*.¹ In the metope above is a hunting scene. There are some hounds, a riderless horse is apparently coming out of a stable, two human figures are dimly visible in the foreground; and there is a large building with other landscape features in the background. It will be remembered that it was arranged that on the plot being brought to a successful issue in London, the conspirators were to come to a meet at Dunchurch in Warwickshire and then carry off the Lady Elizabeth from Combe Abbey and proclaim her queen; but the conspirators brought news not of success, but of utter failure. Without rashness we may assume that the metope represents the meet, and the word *Venantium* at the top right-hand corner supports the assumption.

The podia of the pilasters attached to the arch are also decorated with scenes apposite to the story of the plot. In the first on the left a messenger delivers a paper with a red seal to a gentleman in a scarlet cloak. The scene is entitled *D[omino] Monteglo litterae*, while, as though to express the donor's approval of the warning given in the letter, a text is added: *Beatus vir qui non abiit in consilio impiorum*.² The second podium shows us a more alarming scene. A glowing brazier sends its flames about in different directions, and the hats of the attendants are being blown from their heads. This is *Praeparatio pulueris*, but the attendants seem to be in more proximate peril than ever was the Parliament from the powder-casks of Guy Fawkes. *In malitia eorum disperdet eos*³ comments the designer, and it may be that here we have a reference to some forgotten incident in the preparation of the powder for the conspirators. The third podium illustrates the temper of the time towards the Jesuits, who were not only exposed to the prejudice of the vulgar, but were especially discredited in this matter of the Gunpowder Plot by the exposure of their doctrine of equivocation. Deceit is therefore the note of the picture here. A clerical figure with a large crucifix in his right hand, standing beside a table upon which rests the crown, strikes with his left below the table with some kind of weapon. This is called *Benedictio Jesuitica*, and, again with reference to the doctrine of equivocation, the text chosen is *Ex ipso ore procedit benedictio et maledictio*,⁴ while the donor's feelings move him to verse: *Subdola dextra beat: turbat Diademata leua*. Lastly, in the fourth podium, on the extreme right, a figure in white or grey with an enormous cowl, and with a rosary hanging from its girdle, is engaged in pounding a mixture with pestle and mortar. *Inventum monachi* is the caption explanatory of the picture; but no text from sacred writ can meet the scene of infamy in words that represent the donor's

¹ Ps. ii. 4.² Ps. i. 1.³ Ps. xciv. 23.⁴ Iac. iii. 10.

indignation. No text is here appended; only the pagan metre of a hexameter can express the emotion felt at the efforts of the monk *Solus vt excelsas per se subuerteret arces*.

So much, then, for the destruction of the wicked. For the exaltation of the righteous we must look to the upper part of the monument. Above the dividing cornice with its inscription *MAGNIFICANS SALVTES REGIS EIVS ET SEMINIS EIVS IN SÆCVLVM*,¹ we come to a calmer atmosphere. On the cornice, the Royal Crown, superimposed over the sceptre and sword in saltire, and flanked by the words *TVVM EST | REGNVN*, forms the central point of the picture as a whole. Above it there rests, on the cornice, a large tablet, of the same width as the arch below through which Justice is passing. The golden inscription which once adorned the tablet is unfortunately all but rubbed away, and is illegible save for the large *IACOBI MARMOR* of the first line; the words *OB PAPISTARVM CONIVRATIONEM* in the body of the text, and one of the last words: *SACRVM*. To the left of the tablet, above the pilaster, is the kneeling figure of the king, dressed in parliament robes, but uncrowned, carrying a palm, to indicate possibly that when the picture was painted, the crown had demised. He holds the letter to Monteagle showing the words *Plagam terribilem accipiet hoc Parliamentum*; below is an appropriate text: *DEVS IACOBI refugium nostrum*.² On the other side of the tablet and facing the king, kneels the queen, Anne of Denmark, also with a palm, and commemorated by a verse from St. Luke: *IEIVNIIS et orationibus ANNA seruiit Deo*.³ On the extreme left are two princes in parliament robes, obviously Henry, prince of Wales (though he carries no palm) and Charles, duke of York and Albany, later King Charles I. The text assigned to them is *PRINCIPES et omnes iudices terrae et iuvenes et Virgines, senes cum iunioribus laudent nomen Domini*⁴; but the sentence is broken up so that *Principes et omnes* come immediately under the princes above the cornice; *iudices terrae* are written on the steps of the throne in the Parliament metope below, and the remainder appear at the bottom of the metope below the members of the House of Commons. This curious running of a whole text from the figures of the princes above the cornice to the metope below may conceivably be the designer's way of indicating that the special peril to which the princes were alike exposed was shared with the Parliament; while to show how the machinations of the traitors have been defeated, a triumphant sentence appears above King Charles' head: *STABIT Donec totum impleat orbem*, a loyal sentiment, but, as it proved, peculiarly infelicitous in respect of King Charles and his lawful descendants.

¹ Ps. xviii. 51.

² Ps. xlv. 11. It may be noted that the Vulgate text is *Susceptor noster Deus Iacob*.

³ Luc. ii. 37 (the Vulgate reads *obsecrationibus*).

⁴ Ps. cxlviii. 11, 12.



Picture, painted to the order of Richard Haydocke, perhaps by John Percivall of Salisbury, in commemoration of the twenty-fifth anniversary of the Gunpowder Plot, now at New College, Oxford

At the extreme right of the cornice is the figure, likewise kneeling, of the Princess Elizabeth in scarlet, and wearing in her hair three white ostrich feathers like a lady attending a court at Buckingham Palace to-day. Below her is the text *IPSE liberabit ME de laqueo Venantium*,¹ an allusion clearly to her danger from the meet at Dunchurch represented in the metope below, to the top right-hand corner of which, we may note, the word *venantium* is closely placed. Above her head we read: *TE STANTE VIREBIT VITIS Palatina*, words which, at the time when the picture was painted, must have seemed to be a very defiance of fate, which had driven the queen of Bohemia a fugitive from her home, and had just bereaved her of her eldest son. Yet, when they are compared with the words applied to King Charles at the other end, who can deny that in the end they prove almost prophetically appropriate to the ancestress of the House of Hanover?

That the royal figures are all kneeling is due to the fact that they are represented as being in the presence of the Almighty, who appears at the very top of the canvas, above the monument. Over his head floats a resplendent crown, whence issue two narrow rays of light in such manner as to enclose him in an equilateral triangle with the king and queen at the lower angles. Outside this symbol of the Holy Trinity there appears on either side a celestial choir, with lutes and other musical instruments, singing in *Cantus*, *Contra*, *Tenor* and *Bassus*: *Magnificat anima mea Dominum et exultavit spiritus meus in Deo salutari meo*, and, *Domine in virtute tua laetabitur rex*.² Musical notes are made above these words in the two choir-books carried by *putti* at either corner, but I am assured on good authority that no melody can be made out.

The Almighty is represented in what, it must be confessed, is the most unconventional guise of a bloated young Saxon with long yellow locks. The whole figure is in every way deplorable. On his breastplate are the sun and moon and more than seven stars; in his right hand a sceptre, in the left a very clumsy orb; against this same arm rest the tables of the Law. On his knees is placed a book with seven seals; at his feet, which rest upon the great tablet, we see, half encircled by the text [*non dormiet*] *qui custodit [Israel]*,³ a bird, which may well be taken to be a dove, or an eagle, or a cock; but the text suggests it is the last.

The rays on the right hand of the Almighty lead down to the figure of the king who holds the letter to Lord Monteagle, and is represented uttering the prayer of Hezekiah: *Domine Deus noster, salua nos de manu eius ut cognoscant omnia regna terrae quia tu es Dominus solus*,⁴ in reply to which on the rays comes down the divine promise: *Protegam civitatem istam Vt saluem eam propter*

¹ Ps. xci. 3.

² Ps. xxi. 1.

³ Ps. cxxi. 4. The words in brackets are now illegible.

⁴ Isa. xxxvii. 20.

*me et David servum meum.*¹ Similarly on the queen's side, but here we have almost a dialogue; for whereas she utters the petition of Queen Esther (*Si inveni gratiam in oculis tuis, ô Rex, et si tibi placet, dona animam meam pro quâ rogo et populum meum pro quo obsecro*²) and receives the reply in the words of Ahasuerus (*Quis est iste et cuius potentiae ut haec audeat facere?*³), the queen, unlike the king, who is apparently unable to do more than hold up the Monteagle letter, has the last word: *Hostis et inimicus noster pessimus iste est Haman.*⁴

It is now time to turn to the history of this painting. Who was the painter, who the donor, and how did it come to New College? That it was executed in 1630, the semi-jubilee of the conspiracy, may be inferred from the date that surrounds the text, *magnitudinis eius non est FINIS*,⁵ with which are closed the fifty-four hexameters that are written at the bottom of the canvas.

Who then was the painter? There is a clue to this problem in the letters I P. which may be seen in the left-hand margin of the picture. As we shall see later, there was reason to search first at Salisbury, and by the kind help of Mrs. Richardson of Donhead St. Andrew, whose knowledge of all matters relating to Salisbury is well known, I venture on the guess that the painter was John Percivall, who was employed in painting portraits of Charles I, Henrietta Maria, and Lord Pembroke, as well as the boxes to contain the corporation plate.⁶

Secondly, in answer to the question who was the donor, the picture tells its story far more clearly; for on each of the outer pilasters is a large tablet. That on the left proclaims the motive of the donor in causing the picture to be painted. *SCRIBANTVR HAEC | IN GENERATIONE | ALTERA ET POPVLVS QVI CREABITVR | LAVDABIT DOMINVM.*⁷ The inscription on the left-handed tablet, however, is not so lucid; it runs:

HIC QVIA NVTRITVS | NVTRICEM AGNOSCIT | OPIMAM
SIC QVIA SERVATVS | NVNTIAT ACTA DEI
RIC. HAYDOCKE.

Thus it seems clear that the donor is Richard Haydocke who matriculated as a Junior Fellow of New College on 15 May 1588, and proceeded to a degree in medicine. Save for a journey abroad, he seems to have resided in college till about 1604, and in the following year Benjamin Stone was admitted fellow in his place. This is in no way inconsistent with the hexameter of the elegiac

¹ Isa. xxxvii. 35.

² Esth. vii. 3.

³ *Ibid.* 5.

⁴ *Ibid.* 6.

⁵ Ps. cxlv. 3.

⁶ Charles Haskins, *The Salisbury Corporation Plate*, Salisbury, 1890, p. 51. 'Mr. Percivall for the pictures of the King, Queene & Erle of Pembroke £6. o. o.; p. 207, a charge made by J. Percivall appears in 1643, 'for painting and gilding the frame for the mases, 32s. 6d.'.

⁷ Ps. cii. 19.

couplet on the tablet; but what is the exact meaning of the pentameter? *Sic quia servatus nuntiat acta Dei. Servatus* from what? How specially was Haydocke *servatus*? What connexion, if any, had his life with the Powder treason? or, again, do the words refer merely to the deliverance of Church and State from the conspiracy, or do they refer to his length of days? for in 1630 he must have been about sixty, a ripe age for that time. I venture to submit that the words refer to something much more extraordinary. Haydocke appears in the *Dictionary of National Biography* for two reasons: the one that he published a book; the other, far less creditable to him, that he practised a gross fraud and deception upon the public. The book was a translation of Lomazzo's treatise on painting,¹ which causes one to ask what opinion of John Percivall's skill was formed by this amateur in art. Are we to think that he admired Percivall as an artist, or was Percivall the best painter to be found at Salisbury in 1630? However this may be, the translation of Lomazzo was not likely to bring Haydocke fame, or notoriety. This came to Haydocke in full measure from his preaching when asleep, as it was averred to be. This practice of his created so much stir that the council sent for him to court, and I am indebted to Mr. M. S. Giuseppi of the Public Record Office, the editor of the Hatfield Papers under the Historical Manuscripts Commission, for a copy of the reply of John Gordon, dean of Salisbury, and a prebendary, Thomas Hyde, to Cecil on this occasion.

'This bearer, Mr. Haddock, a physician of his profession, did come lately from Oxford to dwell in the Close of our Cathedral Church of Sarum, and hearing of his preaching in his sleep we made us to be advertised when he was to begin his sermon. And so on Wednesday last being warned, we did enter into his chamber after he had begun his preaching, which was towards three o'clock in the morning, and did continue an hour and a half. Our small judgement thereof is, that if he could preach when he is awaked, as he did in our hearing in his sleep as seemed to

¹ *A tracte containing the artes of curious paintinge carvinge and buildinge written first in Italian by Io: Paul Lomtus painter of Milan and Englished by R. H. student in physik, Oxford, 1598.* The writer of a popular but not over accurate account of Haydocke's preaching, in *Chambers's Journal* (Feb. 17, 1872, no. 425, p. 99), calls it a 'heavy folio': on the contrary it is a small folio and rather thin: he also states that Haydocke put his own portrait on the title-page; whereas it is clearly stated that the portrait is that of Lomazzo.

In the late Dr. J. R. Magrath's *History of the Queen's College, Oxford*, 1921, vol. ii, pp. 206-40, there is a description of two memorial brasses in the college chapel, designed by Haydocke, to two successive Provosts, Henry Robinson, bishop of Carlisle, and Henry Airay. Attention is there also called to the brass at Tingewicke (a New College benefice) to Erasmus Williams, illustrated in G. Lipscombe's *History of Buckinghamshire*, vol. iii, p. 124; and Dr. H. E. Salter, to whom I owe this reference, pointed out to Dr. Magrath the brass in memory of Dr. Thomas Hopper in the ante-chapel at New College. It is not very clear why Dr. Salter's correct description of the figure at the top of this brass was changed by Dr. Magrath from a pentagram to a mullet.

us, that he were worthy to be preferred to the place of a good preacher. His language was much better in his sleeping preaching than it is in his discourse when he is awaked; his method very formal, and in the expounding of his text his preaching very full of learned discourses, his metaphors, allegories and similitudes very fit for his text; the notes gathered out of his text very well appropriated to the matter, and the applications of the doctrine conveniently performed in allegations of Scriptures and sentences of the poets and of the fathers very apt for his purpose. In the end he made a Prosopopeia to the King's Majesty, wherein he did represent the machinations of Satan by the papists of this Kingdom to overthrow religion and erect up again idolatry and popery, with an exhortation to his Majesty to beware of such men and to take order with them;¹ and did end with a godly prayer. We did approach the candle to him, and did perceive that his eyes did not move at all. His hands and his arms remained closed within his sheets, without any moving; his lips and tongue only did move, as did his belly by the respiration of his lungs; at the end of his prayer and his amen did savour a sleeping man's speech, and within short space after he did much groan as a man wearied with sickness, which groaning did continue a space. Our intention was to hear him more amply and then to bring him to the King's Majesty, as he can witness himself; and seeing that he is now sent for by the Lords of the Council we thought it expedient to make you privy of these premises for a beginning of an instruction of the matter, praying you to take our endeavour in good part.'²

Haydocke accordingly went to court and was examined. But by a subtlety of flattery which cannot be sufficiently admired, he contrived that it was by the acumen of the Royal philosopher that the imposture was revealed. Search was ordered of his lodgings, but nothing was found 'of divinity but this little note enclosed', which was apparently a text.³ Haydocke, on detection, confessed the fraud in writing,⁴ and explained that he had been led to the practice of preaching with his eyes shut 'by way of private experiment and practise, first in oratory, Philosophy and Physicke for a bettering of my invention and speech, and afterwards being heard by others, whoe therefore iudged me asleepe because they knew I performed not my vsuall exercises answerable vnto these', and so he had been led on into this deception. He had, however, already received the king's pardon when he wrote the confession, so that when he was expressing his gratitude to the king, he gives praise to God 'whoe hath ministred a way (though through desperat danger) to make me both in eye

¹ John Stow, *Annals*, Londini, 1615, p. 865, col. 2, confirms the story of the Protestant nature of his discourse. He used to 'envay against the Pope, the crosse in Baptisme, and against the last Canons of the Church of England'.

² *Hatfield MSS.* 110/79; dated Sarum, April 13, 1605.

³ *Ibid.* 110/130. Thomas Hyde and other prebendaries of Salisbury to Cranborne; Sarum, May 3, 1605. Cf. also the account in *Yonge's Diary* (Camden Society, 1st series, vol. xli).

⁴ See below, Appendix II, p. 37.

and ear witness of God's great goodness and riches of all heavenly and earthly wisdom in your Majestie's royall person'.¹ Clearly, therefore, Haydocke thought he had been in great peril, and indeed, however harmless may have been the effects of playing these tricks on the bumpkins of Oxfordshire or on his learned but credulous colleagues at Oxford and Salisbury, it was a very different matter when it came to trying them on the king and the council, who might fairly be expected to resent such a prank, and to have their suspicions aroused. An examination before the council in those days was a prospect to appal the bravest, for torture was a common method of extracting important evidence. Haydocke, therefore, had every reason to be more than thankful that James, greatly to his credit, had humour enough to pardon the offender, and was even sufficiently impressed by his oratorical powers to offer him a living provided he took holy orders. So, personally, I have little doubt that the words *Sic quia servatus* allude, not merely to the public crisis of 1605, but to the fright which Haydocke had when he was summoned to court and escaped scot-free.

Haydocke, as has been already mentioned, had gone to Salisbury from Oxford, and began to practise medicine there in 1604. Lord Dorset, writing to Cecil before the royal investigation, describes him as living in the Close at the house of one Mr. Blacker, 'where he practiseth phisik and is in good request'.² Thither he returned, apparently having declined the king's offer of a living, and thence, if Anthony Wood is to be trusted, he moved to London and died there shortly before the outbreak of the Great Rebellion.

How the picture came to New College I can but conjecture. It may have been either a gift, or a purchase, or a legacy, but the presumption is strongly in favour of the first of those options. *Nutricem agnoscit opimam* suggests gratitude and therefore a gift: less probable is it that it was a legacy, and we may observe that no will of Richard Haydocke can be traced at Somerset House between 1630 and 1660. Least probable of all, surely, is the theory that the College purchased the picture. We may therefore fancy that Haydocke, looking back on his past life, remembering what he owed to the College, satisfied by the way in which public events in 1605 had confirmed all his vaticinations about the popish danger, astonished at the narrowness of his own escape from prison and torture, pondered how his feelings thereon could best be expressed, and adopted a method which had the singular and undoubted advantage of at once satisfying his conscience and indulging his ruling passion.

¹ *P. R. O., S. P. 14/13*, no. 80*.

² *P. R. O., S. P. 14/13*, no. 79.

APPENDIX I

Verses at the Bottom of the Picture

Quominus obscuro mergat sub flumine Lethes
 Tempus edax rerum miracula tanta salutis,
 Quae sunt marmoreis merito inscribenda tabellis
 Lubrica dum tacito volvuntur tempora gressu,
 Condidit hunc arcum pietas, auxitque columnis
 Ut laus plena Dei titulis celebretur in isto.

Vox audita licet molles permulceat aures,
 Unde ortum accepit liquidas tenuatur in auras,
 Dum quae sunt oculis subiecta fidelibus haerent
 Firmiter acsi vel scribantur in aere perenni.
 Ergo oculos figant spectacula picta Salutis
 Immemor ut fiat [nostr]orum nemo nepotum.

Turba gravis Paci Fauxo nebulone ministro
 Consilio fisa externo nimiumque cruento,
 Totius exitium molitur fraude Senatus;
 Sacra Domus, populo condendis Legibus aequis,
 Supposito ignivomo laceranda est pulvere, dum Rex
 Prelati ac Proceres cum lecta plebe sedebunt.

Quo mage perficiant hos proditionis alumni
 Tartarea armati sese includere caverna;
 Mystica signa vorant, tactoque volumine sacro
 Sacrifico haud sacro suadente, silentia iurant.
 Votum confirmat Sancti indulgentia Patris,
 Cuius erat coecus feralis Nuncius ales.

Monteglo Domino monitoria epistola missa
 Et perlecta tamen Sapientes vafra fefellit,
 Donec solvisset nodum Rex, Oedipus alter:
 Terribilis plaga haec sit pulverulenta necesse est,
 Sic subito pluresque simul primique peribunt
 Ni Domino placeat tantum fraenare furorem.

Lecta manus iuvenum campum confluit in ipsum,
 Tergaque pennipedum raptim conscendit equorum;
 Venatum veniunt specie, sectantur at isti
 Nimrodes Regum natam de sanguine cervam.
 Retia tendebant saevis animalibus apta,
 Verum irretiri propriis se retibus aequum est.

Ante aras pandit scelerata minantia scripta
 Rex Hezechiae similis precibusque Iehovam
 Compellet supplex ut pandant prodicionem
 Hanc clandestinam ; retulit responsa benigna
 Explosam esse Deo. Extemplo cum coniuge sacra
 Et natis solvit grates et publica vota.

Praestitit hoc ordo munus conformis uterque
 Cum plebe innumera servata ex faucibus Orci.
 Posthac Angligeni celebrabunt annua festa
 Donec flamma vorax totum consumpserit orbem.
 Desuper observat Bonitas Divina rotatum
 Iusticiae currum ductu Bovis atque Leonis.

Aequa sedet, dextram declinans atque sinistram,
 Non austera nimis, nimis aut conspecta remissa
 Ense reos perdit. Miseros permulcet oliva.
 Sic quos perfida mens, fraus saeva, superbia spesque
 Vana triumphantes tulit in penetralia Ditis
 Ponderibus quassat rapidarum Astraea rotarum.

For assistance in deciphering these verses I have to express my obligations to Professor J. L. Myres, Mr. H. L. Henderson, and Mr. E. C. Yorke.

APPENDIX II

Haydocke's Confession

[P.R.O., S.P. 14/13, no. 80*]

To the Kinges most excellent Matie.

Most gratiouse Soueraigne. Whether I should rather complaine of myne unhappinesse in falling into such an inextricable labyrinth of vnexpected trouble or prayse god y^t hereby I have had y^e happy opportunitie of accesse vnto soe gracious a deliuerer out of the same, it were harde for any man to iudge that had not had soe full experience of y^e latter as myself at this instant haue. The full measure wherof cannot be received into your maties most devoted seruants harte ; vntill it be first wholly emptied of y^e full trewth of that matter w^{ch} hath become the cause of both. Wherefore in all trewe loyall thankfulness vnto y^r gracious matie and for the better cleering of all future events & dangers that may iustly be forecast vnto y^e state any way, I doe here in the naked simplicitie of a most thankfull & penitent soule ingeniously confesse and acknowledge, that this vse of my nocturnall discourse, seeming to be in sound and deep sleepe, when indeed I was waking, & had perfecter sense of y^t I conceived & spake then when by day I attempted

III.—*The Roof-bosses in Canterbury Cathedral.*

By C. J. P. CAVE, Esq., M.A., F.S.A.

Read 16th November 1933

PART I. FOLIAGE AND FIGURE BOSSES

THE heraldry of the bosses in the cloisters at Canterbury has been very fully dealt with by our Fellow Mr. Ralph Griffin in *Archaeologia*, lxvi, 447 ff.; under his direction photographs were taken of every severe and of a great number of the separate bosses, both the heraldic and the non-heraldic. About 120 out of some 800 were reproduced in *Archaeologia* and a complete set of the prints is in our library. The heraldic bosses in the Chichele porch were described by the same author in *Archaeologia*, lxxi, 125, where photographs are given of the twenty-nine shields of arms that appear on the vaulting.

The roof-bosses in the cathedral itself have not been exhaustively dealt with, though Willement in his *Heraldic Notices of Canterbury Cathedral* describes the armorial ones, but with some lacunae. As for the rest, those in the quire and presbytery are difficult to see from want of light, and those in the nave and western transepts are very small, so that neither set can be easily studied without a spot light and a telephoto lens.

The bosses may be divided into several classes which occur in :

1. The treasury and its undercroft and the undercroft of the water-tower, twelfth century (middle).
2. The quire and presbytery, including their aisles, and the eastern transepts, twelfth century (late).
3. The eastern part of the crypt, twelfth century (late).
4. The Black Prince's chantry chapel, fourteenth century.
5. The nave and its aisles, the western transepts, and the chapels of St. Michael and of All Saints, fifteenth century.

The bosses in the western part of the cathedral have for convenience been divided into heraldic and non-heraldic bosses.

I. THE TREASURY AND THE WATER-TOWER

These buildings are in the Norman style and their bosses are the earliest in the cathedral. The boss in the centre of the treasury (pl. VIII, fig. 1) consists of four grotesque heads with their chins nearly meeting in the centre ;

round these is a cable moulding, and outside this a circle composed of alternate semicircles and triangles, on each of which is an ornament that may be meant for conventional foliage. A somewhat similar cable moulding occurs on one of the Norman bosses in the chapter house in Bristol Cathedral.

In the undercroft of the treasury are four extremely crude bosses representing human heads facing one another; one is too much damaged to be considered; one of the others shows four heads (pl. VIII, fig. 2), the other two a pair of heads. The whole design is crude in the extreme; large eyes appear below the indication of hair, with no forehead; the noses are large and square, and the faces have a common mouth in the centre, with teeth all the way round. This representation of mouths was not appreciated by some later artist, who, in two of the bosses, has inserted indications of other mouths and teeth; these additions are in the nature of graffiti. Rings have been attached to the bosses from which no doubt lights were hung; some of the rings still remain.

Willis¹ dates the treasury some time after 1130, when the cathedral was dedicated on its completion after the fire of 1067.

In the undercroft of the water-tower are two very small carvings on the intersection of the vaulting ribs. One consists of eight 'petals' radiating from a small circle in the centre; between each petal is a small point like the barb of a rose, and the whole composition may be meant for a flower. The other boss has eight pointed 'petals' radiating from the centre; surrounding them is a flat disc in which there is a number of small roundels. In both cases the diameter of the bosses is hardly more than the width of the vaulting ribs on whose intersections they occur. These very small carvings on late Norman vaulting occur in various buildings.² Willis³ dates the water-tower about 1160.

2. THE PRESBYTERY, QUIRE, AND EASTERN TRANSEPTS

The roof-bosses in the eastern part of the cathedral, which was built after the fire of 1174, form a series interesting not only in themselves, but also for their influence on the subsequent history of the carving of roof-bosses. Almost all are foliage bosses: all have large holes in their centres as part of their original design, and all are exceedingly well carved, evidently by craftsmen who were well used to their work. They are superior to much work that

¹ 'Conventual Buildings of the Monastery of Christ Church in Canterbury,' *Archaeologia Cantiana*, vii, 75.

² Examples may be found in the entrance to the chapter-house at Bristol Cathedral, in the south quire aisle at Christ Church, Oxford, in the north nave aisle at Peterborough, and in the crypt at Gloucester.

³ *Archaeologia Cantiana*, vii, 51.

came after them, and are only surpassed when the Early English style had reached its zenith some sixty years later. Apart from some very small ornaments on the intersection of vaulting ribs, such as those mentioned above, and some that occur in very early Gothic buildings, these bosses in the quire of Canterbury must be the earliest Gothic roof-bosses in the country. It is perhaps reasonable to look to Sens for the germs of work at Canterbury. That cathedral was practically completed by the year 1164.¹ The roof-bosses are quite unimportant, but one or two of them have a slight resemblance to some of the Canterbury examples. The Sens bosses are all small conventional foliage carvings, with holes through the centres, and are all contained within the limits of the vaulting ribs; in fact they are little more than an ornamental edging to the holes that are pierced through the centres of the keystones through which cords were passed for the suspension of lamps. The earliest of the bosses at Canterbury are presumably those in the three western bays of the quire; these, like their precursors at Sens, are small and do not extend beyond the intersections of the vaulting ribs, but they are more elaborate than those at Sens and are much more of an ornamental feature. They are rather different from the rest, being comparatively small, and the very stiff foliage with which they are carved is roughly comprised in a circle. The western boss (pl. VIII, fig. 3) has a central hole with a narrow border of leaves running round it, and outside this are six objects something like anchors without shanks, each arm ending in a little lobed circle, reminding one of the leaf of the pennywort; the whole object seems to be meant for the seed of some plant, but what it might be is not at all apparent. The next boss has seven groups of five-lobed petals as though bent over forwards from the rim of the boss; the third (pl. VIII, fig. 4) has spirally arranged stems ending in vine leaves and bunches of grapes. These three bosses date from 1177, as we know from the account of the building of the quire by Gervase.²

The bosses in the quire aisles have some resemblance to those on the high vault, but they are a little more elaborate and extend rather farther across the vaulting ribs. They are all circular and, with the exception of the ribbing, the designs might have been executed in the workshop. This possibility is mentioned because those to the west of the eastern transepts were erected in 1178, and those east of them in 1182, after William of Sens had ceased to be in charge of the work; but I can detect no particular difference between the bosses of the earlier date and the later.

I have elsewhere³ given reasons for supposing that roof-bosses were carved

¹ *La Cathédrale de Sens*, Lucien Begule, p. 6.

² See Willis, *Architectural History of Canterbury Cathedral*, pp. 32 ff.

³ *Archaeologia*, lxxxiii, 48.

after they had been placed in position. The vaulting ribs come up to the edges of the keystone, which is carved so that the ribs appear to extend across the boss; if this were carved before being lowered into place it would be almost impossible to ensure a correct fit between the ribs and their prolongation over the boss. An elaborate design, such as the Lamb and angels of the central boss of the quire, must, one would think, have been carved after the keystone was in place, otherwise it might have been found to be askew when finally fixed. But central ornamentations such as those in the bosses of the quire aisles at Canterbury might easily have been carved in the workshop, leaving the rib work to be carved after, for it would not matter how they were orientated; being circular the design could never be askew. I think it is reasonable to suppose that the bosses for the aisles were got ready in the workshop by the workmen of William of Sens, leaving only the continuation of the vaulting ribs to be carved later, and that those which had been prepared for the eastern bays were not put up till 1182, after William the Englishman had taken charge of the work. This at any rate would account for the uniform style of all the bosses in the aisles.

The design of these bosses may be divided into two groups in one (pl. VIII, figs. 5 and 6) of which the stiff foliage radiates outward from the centre, in the other it coils round spirally (pl. VIII, figs. 7 and 8), but the two may sometimes be combined together. The individual details vary; one of the most numerous forms is a five-lobed, or rarely three-lobed spreading petal or leaf with scalloped edges (pl. VIII, fig. 9), the grooving being concave; these are usually radiating outwards from the central hole, and have some other forms of foliage outside them. There are sometimes two or more rows of this straight foliage; sometimes it is found round the outer edge of the boss with the scalloped edge pointing inwards. The next form of foliage is a more naturally shaped leaf (pl. VIII, figs. 7 and 8) with somewhat lobed edges and with leaf stalks; they are mostly arranged spirally round the boss. In some examples these are accompanied with fruit which look like blackberries, but which are probably intended to represent bunches of grapes. Some of these leaves have the midrib represented, sometimes by a groove down the leaf, sometimes by a raised rib. Sometimes instead of being arranged spirally, two neighbouring leaves bend towards each other, so that their tips touch, or nearly touch, at the edge of the boss; or it may be that a leaf bends towards its next neighbour but one, leaving a leaf between (pl. IX, fig. 2). This form is interesting as the design is found in other places (e.g. Chichester), and the leaves tend to become conventionalized. The leaves on the Canterbury bosses are not at all like Early English trefoil foliage of a later date; they have a more natural look though no definite plants are indicated. Two bosses in the aisles have birds represented; the most

westerly boss but one on the north side has two birds that may be meant for ducks (pl. ix, fig. 3), with grotesque heads and truncated bills, and on the most westerly boss on the south side are two dragons, one of which is eating fruit

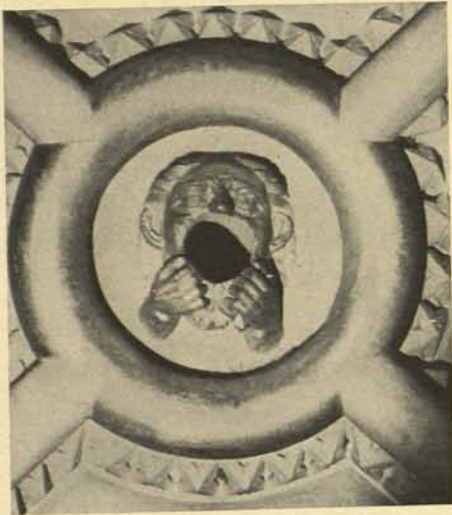


Fig. 1. Boss in south aisle.

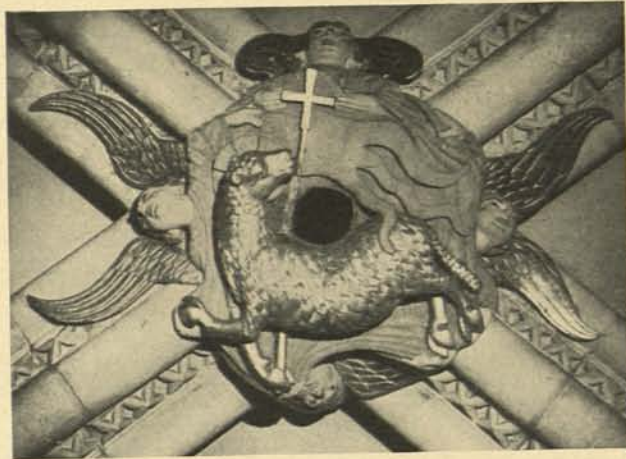


Fig. 2. Boss at eastern crossing.

(pl. ix, fig. 4). The last boss but one in the south aisle is very curious; it consists of a plain circular moulding surrounded by dog-tooth ornament, and in the centre is a bearded head with wide open mouth and hands holding open the lower jaw (fig. 1). The dog-tooth ornament marks the boss as of the same date as the rest of the vaulting, though the 'toothache' head reminds one more of a fifteenth-century figure; but apart from this there is no reason to suppose that this boss, like the others, is not late twelfth century.

The bosses on the high vault of the eastern crossing and on the roof to the east of it must now be described. The boss at the crossing is one of the most remarkable in the country (fig. 2). In the centre is the Lamb with a cross. The Lamb has a cross-bearing nimbus showing that it is intended for the Lamb of God. In one of the fore feet is held the base of the cross; the stem passes behind the body to the top of the boss, where it ends in a small plain cross below which is a broad three-pennoned banner. Round the boss in the angles are demi-figures of angels with their wings extended and their hands holding the sides of the boss. The whole design is typically French; the Lamb with the banner is very rare in England, but very common in France; the same applies to angle figures which are found in France in many early Gothic roofs; there are many examples in Notre Dame in Paris, in the Sainte Chapelle, in the cathedral at St. Denis, and in many other churches. But though somewhat similar detail appears in bosses in France, I do not know of any boss in that country which is nearly as fine as this example.

46 THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL

The next boss eastward (pl. ix, fig. 1) as well as the two bosses in each transept are of the same kind of design as the bosses in the aisles, but perhaps rather more elaborate. The three eastern bosses (pl. ix, figs. 5 and 6) of the high vault are in quite a different style from all the rest in the quire and presbytery. They were erected five years later and almost certainly represent work done by new carvers under William the Englishman. They are of a much freer design, the leaves are more deeply lobed, the midribs are well marked, and the leaves approximate to the Early English trefoil. The boss in the corona (pl. ix, fig. 8) is of the type where two leaves bend towards each other, and have their tips touching at the edge of the boss; between them is another leaf half hidden by the arching tips.

In the two eastern bays of the presbytery there is a small billet ornament between the vaulting ribs instead of the dog-tooth which occurs everywhere else; the corona has the dog-tooth.

3. THE EASTERN PART OF THE CRYPT

We now come to the eastern part of the crypt, the undoubted work of William the Englishman and his craftsmen. The boss under the corona is extremely like its counterpart above, but the other bosses are in quite a different style. We still get lobed leaves, many with midribs, and some radiate from the centre (pl. ix, fig. 7), while some are in a spiral (pl. ix, fig. 9), and the bosses all have large holes in their centres. But the carving is much plainer and flatter. But though lacking in the finish and delicacy of the bosses in the upper building, those of the crypt bear unmistakable evidence of having been inspired by the former in their design.

It must, however, be remembered that these bosses date from 1180, whereas the bosses in the eastern parts of the aisles are two years later. Nevertheless, while the bosses of 1178 and those of 1182 do not show any difference in style, those of 1180 in the crypt seem to me to show a different workmanship. It is, of course, quite possible that they were carved some time after the keystones were placed in position; the vaulting of the crypt is much lower than that of the aisles, and it would not require any elaborate scaffolding for workmen to carve these perhaps a few years after the completion of the building.

There is little doubt in my mind that the early bosses at Chichester were carved by the same workmen who carved those in the crypt at Canterbury.¹ At Chichester there was a serious fire in 1186, and it seems only natural to suppose that the workmen who had completed their work at Canterbury should have come on to Chichester. Some of the bosses at Boxgrove Priory, at

¹ 'The Roof Bosses in Chichester Cathedral,' *Sussex Archaeological Collections*, lxxi, 1 et seq.



Fig. 1



Fig. 2

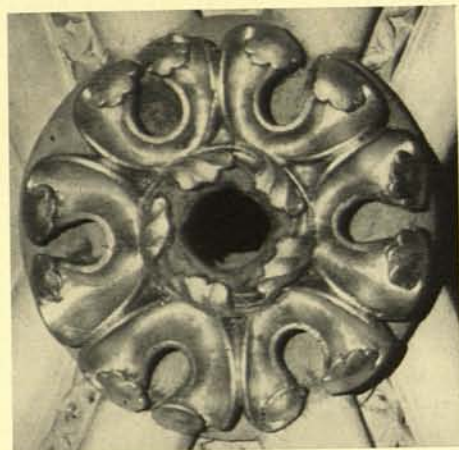


Fig. 3

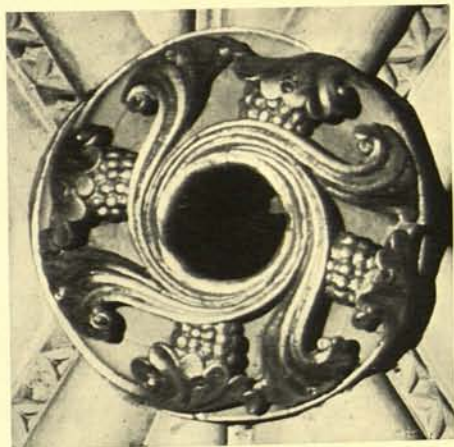


Fig. 4

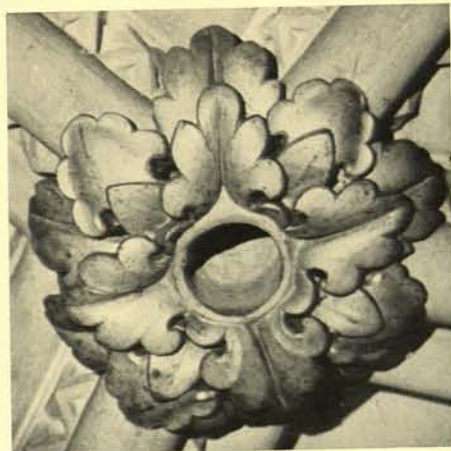


Fig. 5



Fig. 6



Fig. 7



Fig. 8

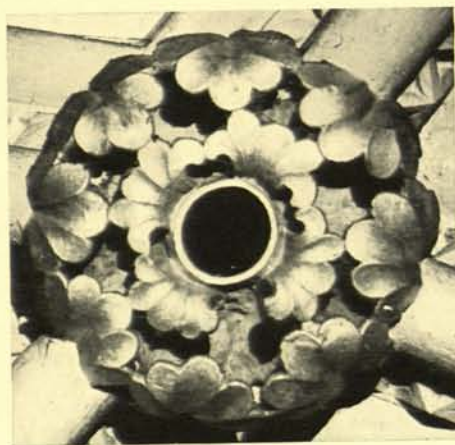


Fig. 9



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

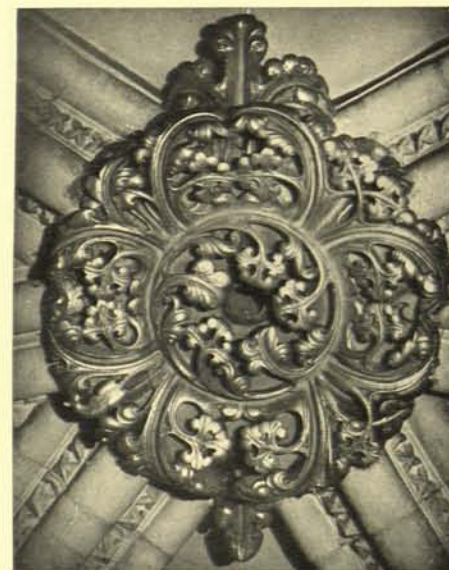


Fig. 6



Fig. 7



Fig. 8



Fig. 9

St. Mary's, Guildford, and at least one of those in the Chapel of the Hospital of St. John and St. Nicholas (now the chancel of the Garrison Church) at Portsmouth seem to bear the same impress. On the other hand, the bosses in Southwark Cathedral and in New Shoreham are in quite a different style, and seem to me to show no Canterbury influence.

In Crondall church, Hampshire, there are two very remarkable bosses which have all the appearance of having been carved by the earlier carvers at Canterbury. One of these is a lamb with a banner; the cross has been broken off but the stem is held in one of the fore feet of the lamb; the other boss consists of foliage and it has very strong similarities to some of the early bosses at Canterbury; these are the only bosses I have found so far which seem to have been derived directly from the style of William of Sens.

To sum up, the bosses in the quire, presbytery, and eastern crypt seem to belong to four classes: (1) the three bosses at the west end of the high vault which date from 1177; (2) the bosses in the aisles and ambulatory, those in the transepts, and the first boss east of the crossing on the high vault; these date from 1176 to 1178, the one east of the crossing from 1179, and those in the four eastern bays of the ambulatory from 1182; but no difference in style can be detected between those of the different dates, and either the same workmen carved both sets *in situ*, or the central designs were carved in the workshop and were lying ready to be put up as soon as the vaulting was finished; (3) the three bosses at the east end of the high vault are quite different in style from the rest; this part of the vaulting was erected in 1184; (4) the bosses in the eastern part of the crypt, though in design they seem to have been inspired by the bosses in the upper part of the church, yet are in an entirely different style of carving; this part of the church was finished in 1180.

4. THE BLACK PRINCE'S CHANTRY CHAPEL

We now come to the fourteenth-century (1363) vaulting in the Black Prince's Chantry Chapel in the crypt. We here find a completely different treatment of the bosses, as is to be expected, the carving being typically fourteenth century in style. Two of the bosses bear coats of arms; one, for Edward III, consists of the Royal arms, with France ancient; the shield is surrounded by conventional clouds and is supported by an angel on each side; the other, for the Black Prince, bears the same arms differenced by a label of three points; round the shield are leaves of a conventional kind, and above is the head of an angel who is supporting the shield. At the west end of the chantry chapel, near the door, is the head of a woman in a reticulated head-dress, traditionally said to represent the Fair Maid of Kent. There are two other women's heads, one in a veil head-dress, the other in a close-fitting

48 THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL

head-dress with the ends fastened under the chin. Close to each of these two heads is a flower with a round centre and seven broad petals, probably meant for roses. At the east end over the position of the north altar is a curious figure of a man with long hair and beard; the man is naked save for the end of some garment draped over his knees and a small piece falling over his left shoulder; he is sitting on the flank of some beast whose head appears under his right arm, while his left arm rests on the beast's hind quarters, his feet are bare and one of them rests on one of the beast's fore feet; above the figure are long leaves. This may perhaps be meant for Samson and the lion, but it is not the usual representation.¹ Another boss shows the pelican in its piety; the bird is standing outside its nest which looks like a basket, and is pecking its breast, while in the nest can be seen the heads of five young. The pelican and the nest are on an oak branch with very natural oak leaves and acorns. There are two bosses representing fights between a dragon and a lion, and two bosses of lions' heads with protruding tongues. There are two lions' heads made up almost entirely of leaves, and one similar human head. There is also a little naturalistic foliage. Some of these bosses have been looked on as emblematic of the French war in which the Black Prince was engaged, the lion and the dragon, for instance, as the struggle between England and France. This may be so, but it cannot be more than supposition.

5. THE WESTERN HALF OF THE CATHEDRAL

St. Michael's Chapel

Besides the heraldic bosses mentioned below there is a large number of five-petalled roses on the vaulting; these are all very well executed; on some of them stems and leaves are represented.

All Saints' Chapel

There are three bosses here, all representing the heads of monks in cowls, each with an inscription on a scroll. The eastern head faces west and has the inscription: Thomas Chillenden Prior. The next head also faces west and has the inscription: Johns Wodnisbergh Prior. The third or most western head faces east and has the inscription: Willms Molasch discipulus. Our Fellow Mr. W. Douglas Caröe read these inscriptions from scaffolding; he is of opinion that the chapels of St. Michael and of All Saints were begun by

¹ Woodruff and Danks, *Memorials of Canterbury Cathedral*, p. 156, suggest that the beast is an ass, that this was meant to typify Samson's slaying the Philistines with the jaw-bone of that animal, and that it was a veiled allusion to the battle of Poitiers, but I can see no resemblance to an ass in the animal on the boss.

Chillenden (Prior 1391 to 1411), continued by Wodnisbergh (Prior 1411 to 1427), and finished by Molasch (Prior 1428 to 1437).¹

The South Transept

The bosses worth noting in this transept are a very fine woman's head with a head-dress, the ends of which come down under the chin, and a naturalistic branch of vine with leaves, bunches of grapes, and tendrils. Such very good naturalistic foliage is not common at this period. There is another example of foliage consisting of rather wavy leaves, of no particular species, characteristic of the Perpendicular period.

The North Transept

In this transept there is little to note except the heraldic bosses described below. There are, however, two heads: one is a woman's with a horned head-dress, the cauls quite unornamented; foliage comes out from under the chin. The other head is a grotesque; the face has a contemptuous grin and the hair is brushed sideways.

The Nave

It is hardly practicable to describe each boss in the nave; on the high vault there are twenty-six bosses in each severy. Amongst these there is a number of foliage bosses; some of these represent conventional and some naturalistic foliage; some of the latter are meant for vines, some for oak, and some are difficult to allocate to any real plant. None of the naturalistic foliage bosses is, however, as good as the one in the south transept. There is a number of roses with two whorls of petals, five to each whorl, and there are some flat four- and five-lobed leaves which may be meant for clover.

There is a great number of grotesque heads of beasts with the vaulting ribs represented as springing from their mouths; they are shown with wide open mouths, and in some of them the teeth of the upper jaw are very prominent. Other beasts' heads have protruding tongues, and one has leaves growing from the mouth.

Of human heads there are a very great many; the majority are grotesque, and some have the vaulting ribs growing into the face, which has a consequent expression of great pain. Some of the heads are not grotesque, and there is one head of a man which is extremely good looking; he has a headband ornamented with roses, the sign of a mourner.

The nave aisles present much the same type of boss as those on the high

¹ *Third Annual Report of the Friends of Canterbury Cathedral*, p. 28 et seq., where these three bosses are illustrated.

vault. There are many human faces, some with stems proceeding from the mouth. Over the window of the fourth bay of the north aisle is the very charming head of a woman in a reticulated caul with a pleated veil just over the forehead. There are examples of beasts' heads, two, three, or four with protruding tongues which meet in the middle of the boss, or with the upper jaws meeting in the centre, no lower jaw being represented, so that the combined mouths form a hole in the centre of the boss like the archaic examples in the undercroft of the Treasury. On the rib between the fourth and fifth bays of the north aisle there is a boss consisting on one side of the rib of a single human head with a moustache and a very small indication of a beard, and on the other side of the rib of a double human head with only three eyes shared between the two faces; one face is clean shaven, the other has a moustache and a double beard.

PART II. HERALDIC BOSSSES IN THE WESTERN HALF OF THE CATHEDRAL

It is convenient to consider the heraldic bosses in the western part of the cathedral separately from the other bosses. Heraldic bosses are found in the nave, mainly in the western severy, and over the clerestory windows, except in the eastern bay; in the aisles of the nave, chiefly over the windows and over the arches; there are a few in the south transept and many in the north transept; there are four under the great tower, and three in the chapel of St. Michael.

Unfortunately the bosses cannot be entirely depended on for heraldic details. All were repainted under George Austin, surveyor and architect to the dean and chapter, about 1825, and tradition says that most of the actual painting was done by Mrs. Austin. In cases where the shields are carved repainting will not alter the design, but many of the bosses, especially those in the north transept, were never carved, but merely had the coats of arms painted on the shields. Repainting might alter the design, and though an examination of the arms seems to show that on the whole the repainting was very carefully done, yet there are some doubtful cases; some of the charges too look more like drawings of the nineteenth century than of the fifteenth.

The bosses in the quire, the quire aisles and transepts, both eastern and western, were again touched up with paint in 1897 and regilded, where they had been gilded before, by Mr. Samuel Caldwell, great nephew to George Austin, and now glazier to the dean and chapter. He tells me that he merely touched up the colours as he found them. Both colour and gilding had suffered badly from the gas used in the cathedral; the gas, not by any means

of the highest grade, was made in private works belonging to the dean and chapter, which were placed close to the west front.¹ Mr. Caldwell tells me also that he did not do any work on bosses in the nave.

Willement published his *Heraldic Notices of Canterbury Cathedral* in 1827, and therefore he must have made his notes at about the same time as the repainting was being done. Probably the painting continued after Willement had made his notes, for he mentions only seven shields 'that have been recently painted',² that is with modern arms; there are now a good many more early nineteenth-century coats than are mentioned by Willement.

Willement has missed a number of bosses besides those which may have been repainted since his day; these will be noticed below. On the other hand his scrutiny of the bosses was fairly close; for instance, he notices the cantons on the labels of nos. 75 and 78, which are very difficult to see, even with a spotlight and strong field-glasses; on the other hand he makes a number of slips in regard to various points which will be noted below.

The arms on the different bosses may be some indication when the various parts of the vaulting were finished, but the indications are rather conflicting and uncertain. The Royal arms with France ancient occur in the western severy and the south aisle of the nave, and point to a date prior to 1405. This is confirmed by the occurrence of the arms of Archbishops Sudbury (1375-81) and Courtenay (1381-96) in the same part of the cathedral; the arms of Arundel (1396-1414) also occur in the nave. There is also an example of the Royal arms with France ancient and a plain label of three points; this would point to a time not earlier than 1399, when Henry IV had come to the throne and there was a prince of Wales in the person of the future Henry V. It must, however, be noticed that besides the arms with France ancient, one example (no. 4) of France modern appears in this part of the cathedral, but it is quite possible that this shield has been tampered with.³

It is, of course, known that Sudbury pulled down the Norman nave about 1378 and was prevented by his death from rebuilding.⁴ He is credited with having built two aisles, 'duas alas', in the posterior, that is in the western part of the church. Willis takes this to mean 'the aisles of the nave which were probably begun before the death of Sudbury, and perhaps carried on afterwards from his funds'. Some have taken 'alas' to mean the transepts, but I think this is unlikely if the roof-bosses are any criterion of the age of the building. The principal part of the rebuilding of the nave was done under

¹ Woodruff and Danks, *Memorials of Canterbury Cathedral*, p. 366.

² Willement, *loc. cit.*, p. 28.

³ See detailed list, pp. 53 et seq.

⁴ Willis, *Architectural History of Canterbury Cathedral*, pp. 120 et seq.

Chillenden, prior from 1391 to 1411, and funds were given by the Archbishops Courtenay and Arundel. The nave was probably finished fairly early in the century, but I do not think that this work could have included the completion of the south or the north transept.

In the south transept we find examples of the Royal arms with France modern, and we also find the arms of Arundel and of Chichele, who was archbishop from 1414 to 1443.

When we come to the north transept there is some difficulty. Over the tower arch are the arms of Edward the Confessor, which would have hardly been added as late as Yorkist times, but most of the other arms in this transept are distinctly Yorkist. It is true that most of the shields are not carved, and that they might easily have been painted long after the vaulting was finished, just as they were repainted about 1825; but we have the rebus of Goldstone, prior from 1449 to 1468, and of Oxney, prior from 1468 to 1471, both of which are carved. The carving of roof-bosses was probably done as a rule after the vaulting was erected, and it might possibly be done long after, but it is reasonable to suppose that roofs were carved and ornamented soon after their erection, while scaffolding and tackle were easily available. I think that the evidence of the roof-bosses makes it probable that this transept was finished five or six years after the priorate of John Oxney, for we find the arms of Rochester impaling those of Russell, who was appointed bishop of Rochester in 1476.

Perhaps the arches of the crossing were finished in Chillenden's time, which would account for the Confessor's arms on the arch; but this example looks later than the one at the west end of the nave.

In the following detailed list of the heraldic bosses I have begun, as Willement did, with those at the west end of the nave. I have then taken in order those over the windows and on the high vaulting of the nave, in the north aisle, south aisle, the south transept, the north transept, the central tower, and the chapel of St. Michael. I found that it was impracticable to follow Willement's numbering; I have therefore adopted a numbering of my own, but I have inserted Willement's numbers in brackets preceded by the letter W.

There is only one coat mentioned by Willement that I cannot find. The arms of St. Edmund (as no. 5) do not occur in the south aisle, as Willement states under his no. 19; I think he mistook the winnowing fans in no. 63 for crowns.

As regards the modern arms, some are mentioned by Willement, but there are several which he either missed or, as is more likely, which had not been painted when he made his survey. Most of the modern coats may be attri-

buted to canons who were holding their stalls from 1825 to 1827. If no. 30 is one of the coats painted by Austin, and if no. 46 is the coat of Walter Brown, we can account for the arms of the canons of all the then existing twelve stalls as occupied from 1825 to 1827, including two occupants of no. 12 stall, Surtees 1803 to 1827, and Russell who was appointed in the latter year, and two of no. 2 stall, Hugh Percy 1816 to 1825, and William Frederic Bayley 1827 to 1845, but the arms of Charles Richard Sumner, who occupied the second stall from 1825 to 1827, do not seem to occur.

LIST OF THE HERALDIC BOSSES IN THE WESTERN HALF OF THE CATHEDRAL
Nave, Western Severy and High Vault

- 1 (W 1). Arms of the Confessor. Over eastern arch of west bay.
- 2 (W 2). Quarterly France ancient and England; there is a large hole in the third quarter of this shield. Over the west window.
- 3 (W 3). Quarterly France ancient and England, a label of three points silver according to Willement; it now looks like gold. Over the arch on the north side of the west bay. A hole in the fourth quarter seems to have been filled up and restored. Ascribed by Willement to the Black Prince; it is more likely to be for Henry of Monmouth, afterwards Henry V.
- 4 Quarterly France modern and England, a label of five points perhaps gules. Over the arch on the south side of the west bay. This is the only shield in the nave with France modern, and it is not mentioned by Willement; he could hardly have missed it if it had been in this position in his time. The shield shows signs of having been tampered with, and being so suspect one can hardly base any conclusions on it.
- 5 (W 4). Azure three crowns gold, two and one; probably for St. Edmund.¹
- 6 (W 5). Gold a lion rampant azure, a label of three points gules; Willement attributes this to Henry Percy, 'Hotspur'.
- 7 (W 6). Gold a chevron gules; probably for Sir Humphrey Stafford who succeeded as Lord Stafford in 1403.²
- 8 (W 7). Gold a lion rampant azure charged on the shoulder with a fleur-de-lis of the field; for Percy according to Willement; perhaps for 'Hotspur's' brother, Sir Ralph Percy, third son of Henry earl of Northumberland, who was slain in the Holy Land in 1399; in the Percy family a fleur-de-lis was used as a difference for the third son.³
- 9 (W 8). Quarterly France ancient and England, a label of five points silver, the three dexter points each charged with three torteaux, the two sinister each with three castles gold. Over the arch at the west end of the eighth bay. Willement missed

¹ *Archaeologia*, lxxvi, 169.

² Ralph Griffin, F.S.A., 'The Heraldry of the Chicheley Porch', in *Archaeologia*, lxxi, 129.

³ Our Fellow Mr. Ralph Griffin has given me these particulars.

54 THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL

the castles; he ascribed the coat to Edmund duke of York; it is more likely to be that of his son Edward.¹

Bosses over the Windows of the Clerestory

North Side

- Bay 2. 10 (W 16). Gules a cross botony gold, for John Bokyngham, bishop of Lincoln.
- Bay 3. 11 (W 14). The arms of the see of Canterbury impaling quarterly one and four gules a lion rampant gold, Fitzalan, two and three chequy gold and azure, Warren, all within a border engrailed gold, the arms of Archbishop Arundel. Willement gives the lion and border as silver, both are now gold; the lion should be so, but the border is given by Woodward as silver.²
- Bay 4. 12 (W 3 modern). Silver a bend between six martlets sable, for William Wellfit, canon, 1785-1833.
- Bay 5. 13 (W 12). The arms of FitzAlan quartering Warren but with no border. Willement gives the lion as silver but it is gold; he attributes the arms to Richard, earl of Arundel, the father of the archbishop.
- Bay 6. 14 (W 10). Gules a fess between six crosslets silver; Willement gives the fess and crosslets gold and attributes the coat to Thomas Beauchamp, earl of Warwick. Griffin³ thinks that the similar coat, no. 159, in the cloisters is for Peverel of Castle Ashby, gules a fess silver between six crosslets gold; the tinctures of fess and crosslets are now silver as stated, and it is difficult to assign it.
- Bay 7. 15 (W 5 modern). Quarterly gules and silver on the second and third quarters a fret gules, over all a fess ermine, for Charles Norris, canon, 1799-1834.
- Bay 8. 16 (W 7 modern). The Nelson coat of arms for Earl Nelson, canon, 1803-38.

South Side

- Bay 2. 17 (W 2 modern). Gules a saltire—charged with another silver; Willement gives it as a saltire gold charged with another vert, for Gerrard Andrews, dean, 1809-25. The tincture of the lower saltire cannot now be made out.
- Bay 3. 18 (W 15). The see of Canterbury impaling gold three torteaux two and one, a label of three points azure, on each a mitre argent, for Courtenay.
- Bay 4. 19 (W 13). Silver on a cross azure, the letter M crowned gold; Willement attributes this to Archbishop Sudbury,⁴ as arms assumed in his official capacity.
- Bay 5. 20 (W 4 modern). Ermine on a chevron sable between three Moors' heads couped proper two swords silver, their points meeting in the centre point, hilted and pomelled gold,⁵ for George Moore, canon, 1795-1845.

¹ See H. C. Andrews, F.S.A., in *Notes and Queries*, clxiv, 172.

² *Ecclesiastical Heraldry*, p. 461. See also Ralph Griffin, F.S.A., 'The Heraldry of the Cloisters of the Cathedral Church of Christ at Canterbury', *Archaeologia*, lxvi, 465.

³ *Archaeologia*, lxvi, 487.

⁴ Willement, *loc. cit.*, pp. 17, 19; see also R. Scarlet's MSS. Harl. 1366, quoted by Willement, p. 156.

⁵ Willement gives the swords as in saltire.

THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL 55

- Bay 6. 21 (W 11). Gules three ostrich feathers erect, each quill fixed in a scroll gold; Willement ascribes this to the Black Prince; it is more likely that it is for Henry of Monmouth, afterwards Henry V.
- Bay 7. 22 (W 6 modern). Ermine on a canton gules an escutcheon voided gold, for Matthew Surtees, canon, 1803-27. I take the blazon from Willement; the shield is very difficult to make out even with a spot light.
- Bay 8. 23 (W 9). Sable a griffin segreant silver; Willement attributes the arms to Colkin of the county of Kent.¹

Nave, over the Tower Arch

- 24 (W 1 modern). The see of Canterbury impaling quarterly 1 and 4 silver a canton sable, Sutton; 2 and 3 gold two bars azure, a chief quarterly 1 and iv azure two fleur-de-lis gold, ii and iii gules a lion passant guardant gold, Manners, for Charles Manners Sutton, archbishop, 1805-28.

Nave on the High Vault

- 25 (17). The arms of the Priory, azure on a cross silver, the letter X surmounted by the letter i sable, in bay 1.
26. The same arms in the same bay: Willement mentions these arms as occurring only once in the vaulting of the nave.
27. The arms of the see of Canterbury, in bay 7; not mentioned by Willement.

*The Nave Aisles*²

The North Aisle

- Bay 1. 28 (W 63 ?). At the east end. Silver three choughs proper, on a chief gules a lion passant guardant gold for the city of Canterbury. This is probably the boss put by Willement by error in the North Transept.
- 29 i (W 31). The arms of Arundel; since there is no border this may be for the father of the archbishop.
- 30 ii (W 28). Gold a lion rampant azure, quartering gules three lucies hauriant. Willement gives the quarterings reversed. The drawing of the arms looks modern; they may be for Hon. Hugh Percy, canon, 1816-25, dean, 1825-7.
- Bay 2. 31 i. Silver a lion rampant gules on a chief sable three escallops silver. Not mentioned by Willement; probably for John Russell, canon, 1827.
- 32 ii (W 24). The see of Canterbury.
- Bay 3. 33 i (W 30) and 34 ii. Sable a dog sejant within a border engrailed silver. Probably for Sudbury, as Willement says; he only gives it as occurring once in this aisle.
- Bay 4. 35 i (W 29). Quarterly silver and gules in the second and third quarters a fret gold, over all a bendlet sable, the whole within a border, now pale grey, perhaps meant for azure, charged with six mitres silver. Willement gives the border as

¹ See also *Archaeologia*, lxvi, 511.

² The bosses marked i in the aisles are those over the arches between the aisles and the nave; those marked ii are over the windows.

56 THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL

azure; he gives the number of mitres as ten; he attributes the coat to Hugh le Despencer, bishop of Norwich, 1370-1406.¹ The boss over the window in this bay is not heraldic.

Bay 5. 36. Percy quartering Lucy; not mentioned by Willement. The boss over the window in this bay is not heraldic.

Bay 6. 37 i (W 27) and 38 ii. Gules a fess between six crosslets gold; the charges are the same as those on no. 14, but they are gold instead of silver, which would make these the Beauchamp arms.

Bay 7. 39 i and 40 ii. The arms of Bokyngham as in no. 10. Willement does not mention these.

Bay 8. 41 i (W 26). Gules a cross engrailed silver between twelve crosslets fitchy gold. Willement does not give the cross as engrailed. This coat is probably for Brookhill of Calehill.² The shield is held by a figure, possibly an angel, whose head and hands are alone visible; this is the only example of this treatment of a shield occurring among the bosses in the western part of the cathedral.

42 ii (W 25). Ermine a bend gules for Frenyngham or Farningham.

The South Aisle

Bay 1. 43 (east end) and 45 ii (W 18). The Priory.

44 i. The coat of Moore as no. 20 differenced with a mullet sable in chief. Not mentioned by Willement; it may be for Robert Moore, canon, 1804.

Bay 2. 46 i. Silver on a chevron between three mullets sable a crescent of the field. Not mentioned by Willement, probably modern.

47 ii (W 23). The coat of Archbishop Sudbury as nos. 30 and 31.

Bay 3. 48 i. Quarterly 1 and 4 again quarterly gold and azure over all three bendlets gules, 2 and 3 azure a lion passant guardant gold, a chief ermine. Not mentioned by Willement, probably for Michael Marlow, canon, 1808-28.

49 ii (W 21). The see of Canterbury.

Bay 4. 50 i. Ermine a rose gules barbed vert, in chief a crescent gold. Not mentioned by Willement; probably for John Boscawen, canon, 1822-51.

51 ii. The coat of Archbishop Sudbury as nos. 30 and 31; only mentioned by Willement as occurring once in this aisle.

Bay 5. 52 i. Quarterly 1 and 4 per cross indented erminois and gules, in dexter chief a lion passant gules; 2 and 3 ermine three bows sable. Not mentioned by Willement, probably for James Croft, canon, 1822, archdeacon, 1825.

53 ii (W 21). The see of Canterbury.

Bay 6. 54 i. The arms of Lord Exmouth. Not mentioned by Willement; no doubt for George Pellew, canon, 1822-8, and afterwards dean of Norwich.³

55 ii (W 22). France ancient and England quarterly.

¹ See *Archaeologia*, lxvi, 489.

² See *Archaeologia*, lxvi, 476.

³ It is curious that examples of coats of arms with augmentations given to two famous admirals, Nelson and Exmouth, and probably the two very worst heraldic devices ever designed, should both appear in the cathedral in consequence of members of each admiral's family being a canon of Canterbury.

Bay 7. 56 i. Gules a chevron engrailed between three martlets silver, in chief a crescent silver. Not mentioned by Willement; perhaps for William Frederick Bayly, canon, 1827-45.

57 ii (W 18). The Priory.

The central boss of this bay consists of four shields with their bases to the centre.

58. On the east side Courtenay with a mitre on each point of the label.

59. On the south side the see of Canterbury.

60. On the west side the Priory.

61. On the north side no. 59 impaling 58.

Bay 8. 62 i (W 20). Gold two chevrons and a quarter gules for Criol or Keriell.¹

63 ii. Azure three winnowing fans gold for Septvans. Willement in his no. 19 probably mistook these charges for three crowns.

Bay 9. In the centre of this bay of the aisle are five shields of arms, one in the centre and four arranged round it. They are not mentioned by Willement and are probably all modern. They are very crudely painted, apparently without much knowledge of heraldry.

64. In the centre the Priory.

65 a. On the east side the see of Canterbury impaling silver semee of crosses patee fitchy sable two chevrons gules. This would appear to be meant for the coat of John Sumner, archbishop, 1848-62, whose proper coat is ermine two chevrons gules.

65 b. On the north side, gold on a cross azure five pheons of the field, probably for Archdeacon Harrison.

65 c. On the west side quarterly 1 and 4 azure a bend between six crosslets patee fitchy gold, 2 and 3 lozengy gold and gules.

65 d. On the south side the coat is evidently meant to be the same as no. 49, for Croft, but the divisions (per cross indented) are badly drawn in the first coat, whose first quarter is shown as gold instead of ermine, and the field of the second coat is shown as semee of arrows instead of ermine.

The South Transept

66 (W 34). France modern quartering England, a label of three points silver each charged with three torteaux. Over the south-west window. Willement does not notice the label, which shows that the shield is for the duke of York.

67 (W 32). France modern quartering England; there is a large hole in the fourth quarter of this shield. Over the south window.

68 (W 35). Azure five fusils conjoined in fess gold, Percy ancient. Over the tower arch.

69 (W 37). Gules three lions passant guardant gold, over all a label of three points silver, for Brotherton. Over the north-west window. Griffin notes² that no. 161 in the cloisters has a label of three points 'possibly by mistake of the sculptor, for a label of five occurs on every other shield'.

70 (W 33). The see of Canterbury impaling Arundel; both the lion and the border are gold.

¹ See *Archaeologia*, lxvi, 473.

² *Ibid.*, 488.

58 THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL

- 71 (W 36). The see of Canterbury impaling gold a chevron between three cinquefoils gules, for Archbishop Chichele.

The North Transept

- 72 (W 52). France modern quartering England. On the central rib in the centre of the transept between the two bays.

Bay 1

- 73 (W 57). The arms of Edward the Confessor.
- 74 (W 58). France modern quartering England, impaling gules a saltire silver, for Nevill. Willement is mistaken in giving a label. He ascribes the coat to Richard duke of York who married Cecily Nevill.
- 75 (W 53). The Royal arms (France modern) impaling quarterly of six ; 1, argent a lion rampant, queue forchee gules, for Luxemburg ; Willement gives the lion as crowned, though it is not so now ; 2, quarterly 1 and 4 gules a star silver, 2 and 3 azure semee de lis gold, for de Baux ; 3, a lion rampant gules for Ciprus ; Willement gives the field as barry of ten argent and azure ; 4, gules two bendlets (not three as given by Willement) silver, a chief per fess silver charged with a rose gules, and gold, for Ursins ; the coat is thus blazoned by Willement, but it does not seem satisfactory, and the two divisions of the upper part of the coat are both now silver ; 5, gules three palets vair, a chief gold ; Willement gives a label of five points which is not visible now ; the palets are shown as silver with a dark broken line down the centre of each, for St. Pol ; 6, silver a fess and a canton gules, for Woodville. The whole coat is for Edward IV and his queen.
- 76 (W 54). France modern quartering England, over all a label of three points silver, each point being charged with a canton gules, for George duke of Clarence, brother to Edward IV.
- 77 (W 55). Quarterly 1, gules a fess silver between six crosslets gold Beauchamp, impaling chequy gold and azure a chevron ermine, Newburgh ; 2, silver three fusils conjoined in fess gules, Montacute, impaling gold an eagle displayed vert, Monthermer ; 3, gules a saltire silver and a label of three points gold, Nevill ; 4, gold three chevrons gules, Clare, impaling quarterly azure and gules fretty gold, in the first and fourth quarters a bend silver, Despenser. Willement gives the fess as gold in the Beauchamp coat, as it should be, and ascribes the whole coat to the 'King Maker'.
- 78 (W 56). Silver on a fess between three annulets sable as many mullets of the field, Sir John Fogge, comptroller of the household to Edward IV.
- 79 (W 61). France modern quartering England, over all a label of three points ermine, each point being charged with a canton gules, for Richard duke of Gloucester, afterwards Richard III. The ermine spots have been made into gouttes probably by Arnold.
- 80 (W 60). Quarterly of four grand quarters, I and IV again quarterly 1 and 4 Montacute quartering Monthermer ; 2 and 3 Nevill ; II again quarterly ; 1, silver on a canton gules a rose gold, Bradstone ; 2, gules a cross engrailed silver, Ingoldsthorpe ;

3, azure a fess between three leopards' heads gold, Delapole; 4, silver on a fess dancetee sable three bezants, Burgh; III, Percy quartering Lucy. The label in the Nevill coat is given by Willement as gobonee silver and azure, it is now of a dark colour. The whole coat is for George Nevill, duke of Bedford, who died in 1483.

- 81 (W 59). Azure a cross argent; Willement ascribes this to the Priory, but no letters can now be seen on the cross; they may have been painted out. Without the letters the coat would be that of the abbey of St. Augustine, which it is unlikely would be found here.

Bay 2

The central boss consists of four shields with their bases to the centre with arms of Cardinal Bouchier (archbishop 1454 to 1486) and certain allied families:

- 82 (W 47). On the south side; quarterly 1 and 4 silver a cross engrailed gules between four water budgets sable, Bouchier, 2 and 3 gules billetee gold and a fess silver, Lovayne of Little Easton, Essex.¹
- 83 (W 49). On the north side; quarterly 1 and 4 Bouchier with a label of three points azure in the first but not in the fourth quarter, 2 and 3 quarterly per fess indented argent and gules Fitzwarine.
- 84 (W 50). On the west side; quarterly 1 and 4 Bouchier quartering Lovayne, over all in the first but not in the fourth quarter a label of three points azure; 2 and 3 Fitzwarine. Willement omits the Lovayne coat.
- 85 (W 51). On the east side; quarterly 1 and 4 Bouchier with a label azure in the first quarter only; 2 and 3 quarterly gold and vert Berners. Willement states that each of the three points of the label is 'charged with as many lions passant or'. There are now no signs of charges on the labels; the Cardinal's brothers bore Lord Berners a label of England, Earl Fitz Warine a label of France, the earl of Essex bore his paternal arms undifferenced.²
- 86 (W 48). The arms of the see of Canterbury impaling quarterly Bouchier and Lovayne; over the shield is a cardinal's hat with sixteen tassels, eight on each side, for Cardinal Bouchier.
- 87 (W 62). The arms of the see of Canterbury impaling gules three kemp sheaves within a border engrailed gold, for Archbishop Kemp; over the shield is a cardinal's hat with sixteen tassels.
- 88 (W 45). France modern quartering England all within a border silver, impaling gules a saltire silver, for Humphrey Stafford duke of Buckingham and his wife Ann Nevill, aunt to Edward IV.
- 89 (W 46). Gules two keys, their rings conjoined, in bend sinister, gold, over them in bend a sword silver, hilted and pommelled gold, for the see of Winchester, impaling the Beaufort arms, for Cardinal Beaufort. Willement gives the keys in bend, the sword in bend sinister, and the sword as intersecting the keys. He also gives a cardinal's hat over the shield; it is in fact on the other side of the vaulting rib, and has six tassels.
- 90 (W 44). Quarterly 1 and 4 gold a cross engrailed gules, Haute, 2 and 3 per pale azure

¹ *The Complete Peerage*, v, 176.

² Woodward and Burnett, *Heraldry*, ii, 417.

60 THE ROOF-BOSSSES IN CANTERBURY CATHEDRAL

and gules a lion rampant ermine; the lion should be crowned and have a double tail, the coat being for Cawne.

91. Silver two chevrons azure. Willement does not notice this coat, which is for Richard Bagot, dean, 1827-45.
- 92 (W 42). An eagle with wings expanded gold, the emblem of St. John, standing on a couchant ox, coloured dark red, horns and hoofs gold, charged on the flank with the letters NE in gold. This rebus, which is not on a shield, is for Prior John Oxney.
- 93 (W 43). The arms of the see of Canterbury impaling gold on a chevron gules a mitre gold, a border engrailed silver, for Archbishop Stafford. Willement gives the border as sable, as it was in the Archbishop's Hall according to Scarlet.
- 94 (W 41). Silver on a saltire gules an escallop gold, for the see of Rochester, impaling gules three roses gold for John Russell, bishop of Rochester, 1476-80.
95. Silver three Catherine-wheels sable within a border engrailed gules, for Scott of Scott's Hall. Not mentioned by Willement.
96. Fitzalan quartering Warren. Not mentioned by Willement.
- 97 (W 40). Quarterly 1 and 4 gold a maunche gules, Hastings, 2 and 3 quarterly 1 and 4 gules a bend silver, Foliot, 2 and 3 gold. Gules a bend silver is Foliot often quartered with Hastings. Some charge has probably vanished from the gold quarter which must remain unexplained. Willement makes the silver bend over all, which is not the case.
- 98 (W 39). Three gold stones conjoined surmounted by a mitre; this is the rebus of Prior Goldstone I; Willement describes the stones as on a shield, but this is not so.
- 99 (W 38). Silver a cross gules for St. George.
100. Percy quartering Lucy. Willement does not notice this boss.

The Central Tower

- 101 (W 64). In the centre the arms of the Priory.
- 102 (W 65). On the south-east; France modern quartering England, for King Henry VII.
- 103 (W 66). On the north-east; the arms of the see of Canterbury impaling quarterly gules and erminois on the first and fourth quarters a goat's head erased silver armed gold, for Archbishop Morton. Willement gives the coat as gold and ermine.
- 104 (W 67). On the south-west; the arms of the see of Canterbury impaling gules a fess gold in chief a goat's head erased silver armed gold and in base three escallops silver, for Archbishop Wareham.

The boss to the north-west is not a shield of arms; it bears a mitre surrounded by scroll work.

The Chapel of St. Michael

In the centre of this chapel is the monument of Margaret Holand, daughter of Thomas Holand, earl of Kent, and grand-daughter of the Fair Maid of Kent; with her effigy are those of her two husbands John Beaufort, earl of Somerset, son of John of Gaunt, who died in 1410, and Thomas, duke of Clarence, second son of Henry IV, who died in 1421. Margaret Holand died in 1437. The monument and the vaulting of the chapel were probably completed some time after the death of the

duke of Clarence and before that of his widow. On the lierne vault are a number of bosses, mostly five petalled roses with stems and leaves. On the central rib are three shields of arms.

105. At the west end ; France modern quartering England, all within a border gobonee silver and azure, Beaufort.
106. At the east end ; France modern and England quarterly, over all a label of three points ermine for the duke of Clarence.
107. In the centre the same arms as the last, impaling England within a border silver, the arms that Thomas Holand, son of the Fair Maid of Kent, was allowed to bear by his half-brother Richard II.¹

On the north side of the central line are two bosses, each bearing a silver greyhound couchant, collared gold, a Beaufort badge ; each dog has a lead lying over its back, meant no doubt to be attached to its collar on the far side ; besides the lead, each dog has a leash attached to the collar ; the leashes are rolled up into neat little balls which lie on the ground beside the dogs. On the south side of the central rib are two bosses, each bearing a white hind lodged, ducally collared, and chained gold, a badge of the Fair Maid of Kent.

¹ Woodward and Burnett, *Heraldry*, ii, p. 438.

IV.—*A Thirteenth-Century Choir of Angels in the North Transept of Westminster Abbey and the Adjacent Figures of Two Kings.*

By C. J. P. CAVE, Esq., M.A., F.S.A., and L. E. TANNER, Esq., M.A., F.S.A.

Read 16th November 1933

THE CHOIR OF ANGELS

ON the soffits of the lancet windows in the north transept of Westminster Abbey there are medallions, four in each window, enclosing demi-figures of angels which bear musical instruments and other objects. The date is about 1250. It is impossible to see these carvings in the ordinary way as the soffits receive no light from the windows and they are about 58 ft. above the floor level. After dark when the Abbey is lit up it is just possible to see that there are carvings, but details are not visible. A spot light is required to see the figures properly and to enable them to be photographed.

Neale and Brayley mention the medallions,¹ illustrate nos. 1, 6, 10, 13, 18, and 23,² and give their opinions on the objects carried by the angels.³ In the following account we have adopted Neale and Brayley's numbers; no. 1 is the lower of the two medallions on the west side of the west window, no. 2 is the one above this, no. 3 is the upper medallion on the east side of the same window, no. 4 the one below it, and so on. In the detailed list of the figures the identifications of Neale and Brayley are given in square brackets where they differ from our own.

The late Professor W. R. Lethaby⁴ describes these figures and gives small drawings of nos. 1, 2, 23, and 24. He mentions that in July 1911 he 'examined the medallions from the high Coronation stand erected in the North Transept', and adds that 'when opportunity offers they and all the sculptures should be photographed'. He is probably the last person to have seen them till one of us photographed them in August 1932.⁵

In the volume on Westminster Abbey issued by the Royal Commission on Historical Monuments the existence of these 'half figures of angels, mostly

¹ *History and Antiquities of the Abbey Church of St. Peter, Westminster*, ii, 29.

² *Loc. cit.*, Pl. XLIX.

³ *Loc. cit.*, ii, 147, footnote.

⁴ *Westminster Abbey Re-examined*, p. 188.

⁵ In November 1934 a scaffold was erected to clean the lancet windows and we were able to view these figures at close quarters.

playing musical instruments' is merely mentioned.¹ Ackerman also makes a bare mention of the figures.²

Some of the figures are very perfect while others are badly weathered. One might suspect nineteenth-century restoration were it not that Neale and Brayley, whose work was published in 1823, say that 'all the above medallions are of freestone, but of different degrees of hardness; some being a dense cream-coloured stone are sharp and tolerably perfect; the others, being of a soft and friable substance, are very much decayed'.

All the angels save three are in circular medallions, about a foot and a half in diameter, enclosed by narrow mouldings from which stalked leaves, three or four lobed, grow out spirally; the midrib is usually represented either by a raised line or by a groove; in some cases each lobe has a midrib. Three of the figures, namely nos. 4, 23, and 24, are in lobed squares with no leaves.

The angels are dressed in loose, rather voluminous robes that look like linen albs, but no apparels are represented; in those cases where enough of the figure is shown a cord is seen fastened round the waist. The sleeves are wide and in some cases the sleeves of an undergarment are visible. In some cases, nos. 11 and 19 for instance, the sleeves are very voluminous, suggesting a surplice rather than an alb. In some of the figures an amice is shown.

The hair is mostly wavy or curly and a narrow band is worn which passes above the forehead. The wings, as far as they can be seen, are perfectly plain and show no indication of feathers except in nos. 16 and 19.

The objects held by the angels other than the musical instruments seem to suggest the vessels, etc., used in the Mass; no. 3 the paten, 6 the lavabo bowl, 11 the missal, 12 the host, 15 the chalice, 18 the mass dial, 22 the censer and incense boat, 24 bells.

As mentioned by Lethaby³ casts were taken of these medallions by Cottingham about a hundred years ago. We have examined these casts which are now in the Victoria and Albert Museum; they have, as Lethaby says, been excessively touched up. There are 18 casts, nos. 6, 15, 20, 21, 23, and 24 being missing. So much have they been touched up that many of them look like completely modern sculptures. Little was to be gained by comparing them with the photographs of the originals but a few minor points came to light. In nos. 7 and 16 the objects held by the angels are definitely scrolls. In the cast of no. 9 a rather peculiar head-dress is shown, which, however, does not exist in the original. In this same figure we had thought that the left hand was veiled, but in the cast three fingers of this hand are shown between two

¹ p. 45.

³ *Loc. cit.*, p. 189.

² *History of the Abbey Church of St. Peter's, Westminster*, ii, 23.



Fig. 1. Nos. 1 and 2



Fig. 2. Nos. 3 and 4



Fig. 3. Nos. 5 and 6



Fig. 4. Nos. 7 and 8



Fig. 1. Nos. 9 and 10



Fig. 2. Nos. 11 and 12



Fig. 3. Nos. 13 and 14



Fig. 4. Nos. 15 and 16

fold of the alb, and are indeed visible in the photograph of the original when once attention is called to them.

DESCRIPTION OF THE INDIVIDUAL FIGURES

PLATE X

- 1 and 2. Both figures bear palm branches. Both are very well preserved.
3. The angel holds a round object with a circular depression in the centre, no doubt the paten. Rather weathered, the features are barely discernible. [A cymbal]
4. The hands are raised in an attitude of prayer or adoration. Badly weathered, features barely discernible.
5. The hands are raised, and in the right hand is a very much weathered object which Neale and Brayley call a crown, and Cottingham so depicts it in his cast. Very badly weathered, features barely discernible.
6. A boat-shaped object is held up in both hands; perhaps this is the lavabo bowl. Badly weathered, features barely discernible. [A sort of basin]
7. A scroll is held in the left hand, and the right hand is held up and seems to be holding the top of the scroll; a collar is shown which is probably the amice. Badly weathered, features barely discernible. [A round object probably a cymbal]¹
8. A round object is held in the right hand, which is draped apparently by a fold of the alb; the left hand is holding a portion of the dress and is touching the round object and has the third and fourth fingers flexed. Weathered, all the features discernible but worn. [A disc]

PLATE XI

9. Some object is held in the left hand; the right hand touches this object, and has the third and fourth fingers flexed. Badly weathered, features barely discernible. [Playing on a wired musical instrument by striking it with two fingers]²
10. A crown is held in the right hand which is covered by a fold of the alb; the left hand is laid on the side of the crown, all the fingers being extended. A very well preserved figure.
11. A book is held in the right hand which is covered by a fold of the alb; the left hand holds the book open with the thumb and forefinger; an amice is worn and is very well shown. The figure is looking down on the book as though reading. A very well preserved figure.
12. A disc-shaped object is held in front of the breast with both hands; perhaps this is meant for the host. A well preserved figure. [Probably the consecrated wafer]
13. A gittern is held by the left hand, the base of the instrument being against, or close up to, the right shoulder, so that it is held horizontally across the figure; the right hand is playing the gittern with a plectrum. A well preserved figure. [A cithera or psaltery]

¹ Neale and Brayley probably mistook part of the wing of the angel for the round object.

² Neale and Brayley apparently mistook the top of the wing and a portion of the dress for a musical instrument.

14. A palm branch is held in the left hand, and the right hand is held up palm outward. The figure is looking sideways and upwards. Much weathered, the features are barely discernible.

15. The left hand, covered by a fold of the alb, holds a chalice. The left hand touches the side of the chalice, the third and fourth fingers being flexed; the amice is shown. Worn, features not discernible.¹

16. A scroll is held up by the left hand, and the right hand is pointing to the lower part of the scroll. The wings are covered with a pattern meant no doubt for feathers. A well preserved figure.

PLATE XII

17. A triple pipe held to the mouth by both hands; double pipes are common, but a triple pipe is perhaps an artistic licence.² A well preserved figure. [A syrinx]

18. A portable quadrant sun-dial held in the left hand, which has the third and fourth fingers flexed; with the right-hand index finger the angel points to a line on the dial which would indicate a morning hour. The angle of the dial is upwards.

19. Both hands are draped and each is holding up a round object. The fact that both hands are draped would seem to preclude the idea that the objects are cymbals. Perhaps they are meant for the sun and moon. There are indications of feathers on the edges of the wings. A well preserved figure. [Two cymbals]

20. A viol is held vertically downwards in the left hand, and the bow is held underhand in the right hand. The viol is an early form with incurved sides like a guitar. The downward position of the instrument and the way the bow is held are both characteristic of the true viol.² [A bass viol]

21. A psaltery is held in the left hand and is played by the right hand with a plectrum. The shape is unusual, resembling a small harp.² A well preserved figure. [A dulcimer]

22. The chain of a censer is held upwards in the left hand, the censer itself and the fastening for the top of the chain hang down on each side. The right hand, draped by a fold of the alb, holds up an incense boat. A well preserved figure.

23. A small harp of a common pattern is held in the left hand, which, however, is not visible; it is played by the right hand. Much weathered, features barely discernible.

24. The figure is holding a hammer in each hand; one hammer rests against the outside of a bell. Much weathered, features barely discernible. [Striking a pendent bell with two hammers, one in each hand]

THE TWO KINGS

PLATE XIII

In the east and west splays of the lancet windows immediately below the Angel Choir there are two shallow trefoil-headed niches each containing the figure of a king. These figures have never before been photographed. They

¹ Neale and Brayley have transposed nos. 15 and 16.

² For these details we are indebted to Mr. William Bentley.



Fig. 1. Nos. 17 and 18



Fig. 2. Nos. 19 and 20



Fig. 3. Nos. 21 and 22



Fig. 4. Nos. 23 and 24



Fig. 1. King Edward the Confessor



Fig. 2. King Henry III

are mentioned by Neale and Brayley¹ and were engraved by them, and they are noted in the Inventory issued by the Royal Commission on Historical Monuments.²

Neale and Brayley suggested that they represented Edward the Confessor and King Henry III, and with this suggestion the late Professor Lethaby agreed.³

Neale and Brayley describe⁴ these figures as follows:

(1) EDWARD THE CONFESSOR. He 'has a short bushy beard and curled hair; he is looking upward, and seems to have held some object in each hand, though now destroyed; the face is much corroded and otherwise injured: beneath his feet is a prostrate figure (probably intended for Satan) whose distorted posture and grinning countenance indicate great pain'.

We are unable to decide what the object is.

(2) KING HENRY III. He 'has a short curly beard, and his hair is disposed in flowing locks; his left hand bears a sceptre, which has terminated either in a trefoil or a fleur-de-lis, now broken: his right hand holds up part of his mantle'.

They add that this figure has much of the character of the figure on his tomb. These two figures bear a close resemblance to the two central figures, representing probably the Confessor and the Pilgrim under the Rose window in the south transept.

¹ ii, 147.

² p. 45.

³ *Westminster Abbey Re-examined*, p. 190.

⁴ p. 147.

V.—*Notes on the Evolution of Plate Armour in Germany in the Fourteenth and Fifteenth Century.*—By J. G. MANN, Esq., M.A., F.S.A.

Read 24th November 1932

IN two previous contributions I have tried to trace the development of plate armour in Italy¹ and Spain,² and in the following pages it is my intention to attempt to do the same for Germany. Under this name are included for the present purpose all the Teutonic countries within the Holy Roman Empire and Scandinavia. These notes, like their predecessors, are designed to supplement the first volume of Sir Guy Laking's *Record*,³ in which he passed lightly over the fourteenth and fifteenth centuries in order to devote himself to the later periods from which the bulk of existing armour has descended.

Whereas Spain showed herself to be in some ways an offshoot of Italy, Germany developed a native manufacture of international importance. Froissart has described in a well-known passage how in 1398 Henry, Lord Derby, and Thomas Mowbray, Duke of Norfolk, sent respectively to Milan and Germany for armour 'tant de plates que de mailles' for their abortive duel before Richard II. At that time Milan had already established a reputation for her 'white' armour, and Germany was better known for her swords. But in the next fifty years the platers of Nürnberg, Augsburg, Landshut, and Innsbruck made rapid strides and achieved a place for their products beside that of Lombardy. From this time onwards the rivalry of the forges on either side of the Alps lasted for as long as armour continued to be worn.

The chief source of our knowledge of the outward appearance of German armament during the fourteenth century is provided by the monumental effigies carved in relief which exist in large numbers. Since Hefner-Alteneck's⁴ time they have received little attention in this regard, and there is no work devoted specifically to the whole field of German sepulchral art. Though they have found a place in the history of German sculpture, the monuments have been discussed mainly for their stylistic relationships with other contemporary work, and these studies are dispersed among numerous periodicals and

¹ *Archaeologia*, lxxx, 117-42, 'The Sanctuary of the Madonna delle Grazie'.

² *Ibid.*, lxxxiii, 285-305, 'Notes on the Armour worn in Spain from the tenth to the fifteenth century'.

³ *A Record of European Armour and Arms through Seven Centuries*, 5 vols., 1920-22.

⁴ J. H. von Hefner-Alteneck, *Trachten, Kunstwerke und Gerätschaften vom frühen Mittelalter*, 10 vols., Frankfurt a/M., 1879-89.

topographical works.¹ It will be noticed that these German tombs are markedly different from contemporary English work, and their iconographical value is reinforced by the fact that more examples of actual armour, even though they are often fragments, have survived from this time in Germany than in any other country.²

In the first quarter of the fourteenth century the combination of helm, hauberk, and surcoat provided much the same appearance here as elsewhere, except that Germany did not follow the fashion of the other northern countries in the use of ailettes. The late M. Buttin has stated that they were never worn in Germany or in Alsace,³ and it is seldom that one is in a position to qualify the generalizations of that acutely observant historian of arms. There are, however, fringed ailettes on the monuments of Johann and Heinrich Otto, Landgrafen von Hessen (pl. xiv, fig. 1) at Marburg, on the statue of Godfroy de Bouillon in the Hansasaale in the Rathaus at Cologne, and on the effigy of Rudolf von Thierstein, †1318, in the Minster at Basel. But the two Marburg effigies have strong French affinities in the way in which the mail coif is thrown back on the shoulders revealing the curling hair on either side of the face, the mittens hanging from the wrists, and the voluminous surcoat; while the proximity of Cologne and Basel to France suggests that the portrayal of ailettes here may also be due to outside influences. Certainly if they had been worn at all generally in Germany one would expect the painter of the spirited scenes of chivalry in the Codex Manesse,⁴ who delighted in crested helms and shields, to have made liberal use of them.

Besides the evidence of tombs and architectural sculpture there are the wall-paintings representing scenes of romance and war which have survived in some of the castles of the Alps. Medieval secular painting is less well known than the much larger field of religious art, with which it cannot always aspire to compete on aesthetic grounds. But knowing the literalness of the military mind one may well believe that these somewhat naïve frescoes represent very truthfully what their authors were well accustomed to see. The castle of Sabbionara⁵ at Avio, the seat of the Ghibelline family of Castelbarco, near the old Italo-Austrian frontier, has preserved a remarkable series of military pictures of

¹ See Appendix II, *infra*, pp. 91-7, where a select bibliography is given following a representative list of German military tombs, including all those referred to in the following pages.

² See Appendix I, *infra*, p. 90, which gives a list of examples other than those described by Laking, *op. cit.*

³ *Le Tombeau de Ulrich de Werdt à Strasbourg*, Archives Alsatiennes, 1925, and supplement *le Gisant de Ulrich de Werdt*, *ibid.*, 1928, a most detailed examination of the equipment of the forties.

⁴ Reproduced in facsimile, Leipzig, Insel Verlag, 1929.

⁵ A. Walcher-Moltheim, *Altes Kunsthandwerk*, i, 268, 1927; M. Borgatti, *Esercito e Nazione*, ii, 806, 1927.



Photo. Stadt. Bildstelle
Fig. 1. Effigy of Heinrich Otto,
Landgraf von Hessen, †1308,
[c. 1320], Church of St. Elizabeth,
Marburg



Fig. 2. Bas-relief of one of the Electors of Bavaria, from
the former Kaufhaus at Mainz, 1318, Museum of Anti-
quities, Mainz

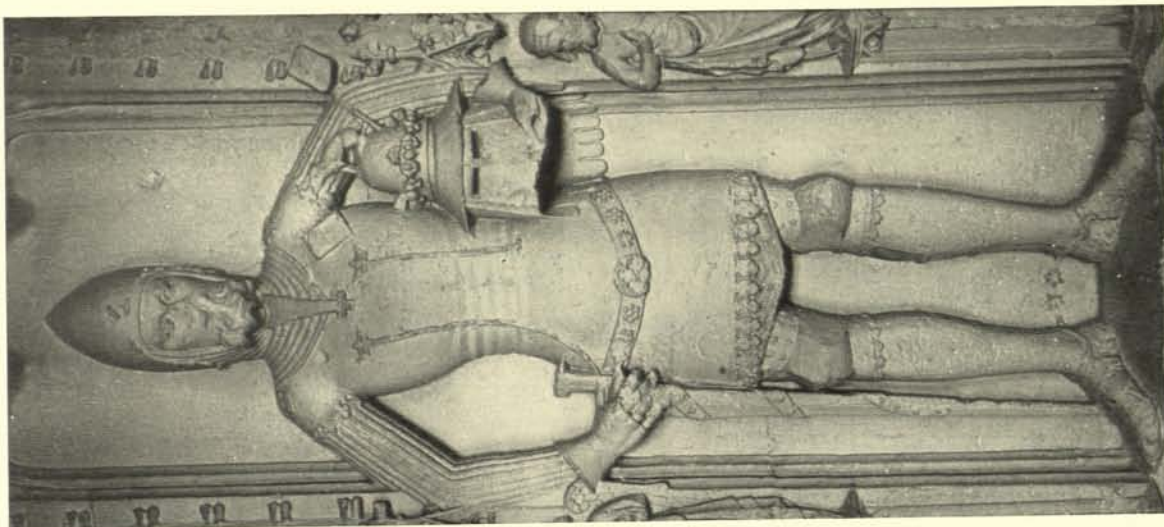


Photo. Christof Müller
Fig. 3. Effigy of Johannes von Falkenstein,
†1365, Arnsburg, Wetterau, from a cast in the
Germanisches Museum, Nürnberg

Published by the Society of Antiquaries of London, 1935



Figs. 1 and 2. Helm of the XIVth century, from a monument of the Kornburg family in the church of Allerheiligen, Kleinschwarzenlohe, now in the Germanisches Museum, Nürnberg

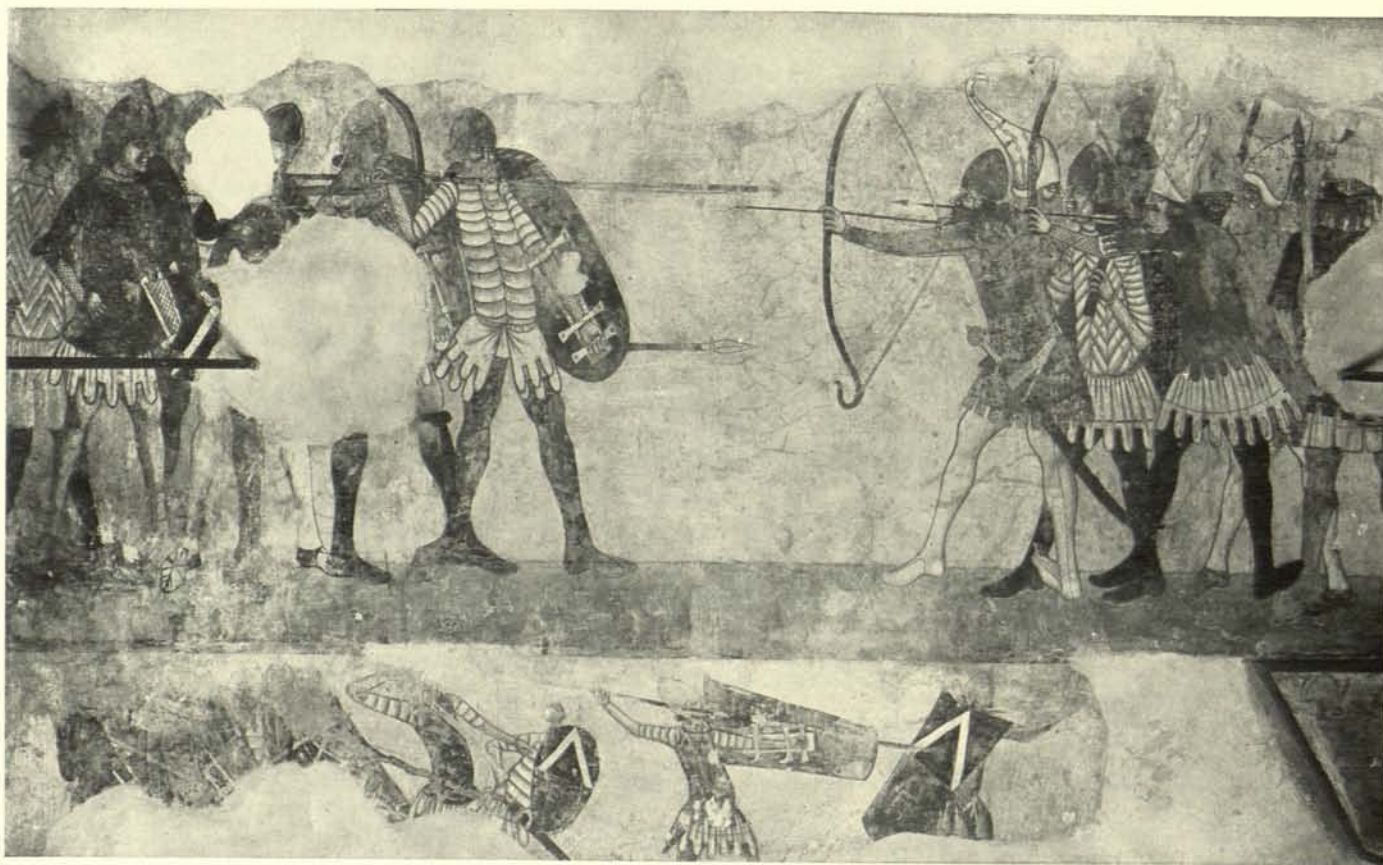


Fig. 3. Combat of foot-soldiers. Wall-painting of the middle of the XIVth century in the Castle of Sabbionara, Avio

the middle of the fourteenth century which fortunately escaped destruction in the late War by a margin that can be reckoned in yards (fig. 1). It shows not only the armour of the knights, but, what is much rarer, of the common soldiers (pl. xv, fig. 3). Farther north, there is the castle of Runkelstein, now known as Roncolo, near Bozen (Bolzano), while on the other side of the Vinschgau from Churburg are the ruins of the castle of Lichtenberg, from which the frescoes were stripped before the War and transferred to the Ferdinandeum at Innsbruck.

In the middle years of the fourteenth century, when armour of plate was being increasingly adopted throughout Europe, one notices certain points of resemblance between the military equipment of Germany and Italy. This is not surprising when one remembers the contact between the two countries at this time. Italy was still technically part of the Holy Roman Empire, and the expeditions of Henry VII, Louis the Bavarian, and Louis, king of Hungary, across the Alps left behind them military adventurers who found a profitable field in the constant petty warfare of the Italian cities. Professional soldiers, like Duke Werner of Urslingen, Counts Wolfart, Lando (von Landau), and Anichino di Bongardo (Baumgarten), commanded free companies of well-equipped *barbute* which were largely composed of Germans and Hungarians. Incidentally, Count Lando met his death in 1363 at the hands of the English 'White Company' when fighting in the service of Galeazzo Visconti.

The features in common between Italian and German equipment at this time are the use of the nasal which joined the aventail to the bascinet, to which it was fixed by a hook on the brow, the T-headed chains¹ attaching the arming sword, dagger, and sometimes helm to the body, and a continued faith in the protection of the mail sleeves of the hauberk without plate additions. The nasal, which seems never to have been worn in England, is shown in position in fig. 1, and on the relief of the Conversion of St. Paul on the exterior of St. Stephen's Cathedral at Vienna. Plate armour was adopted for the legs more freely, but in general there is a marked contrast with the practice in England, where after 1350² the limbs are invariably shown cased in plate and the body clad in the short, tight-fitting jupon. The neat uniformity which characterizes all English representations of armed men for the next sixty years, and which makes our brasses and effigies exact replicas of each other, is in marked contrast to Germany, where one seldom finds two exactly alike.

When weighing the evidence of contemporary sculptured and pictorial

¹ Cf. fig. 1; pl. xiv, figs. 2 and 3; pl. xvi, figs. 1 and 3. This feature is rarely found in England, but is shown on the effigies of a knight in St. Peter's, Sandwich, and of a Hilton, c. 1370, at Swine, Yorkshire. The brass of Ralph de Knevinton, †1370, at Aveley is of continental origin.

² Several of the figures in the glass at Tewkesbury, completed by 1344, are shown with limbs completely encased in plate (Rushforth in *Trans. B. and G. Arch. Soc.*, xlv, 321).

illustration consideration must be given to the centres of production and how far they have affected the general impression. The output of a single workshop, representing the same model over a number of years, if it has survived in

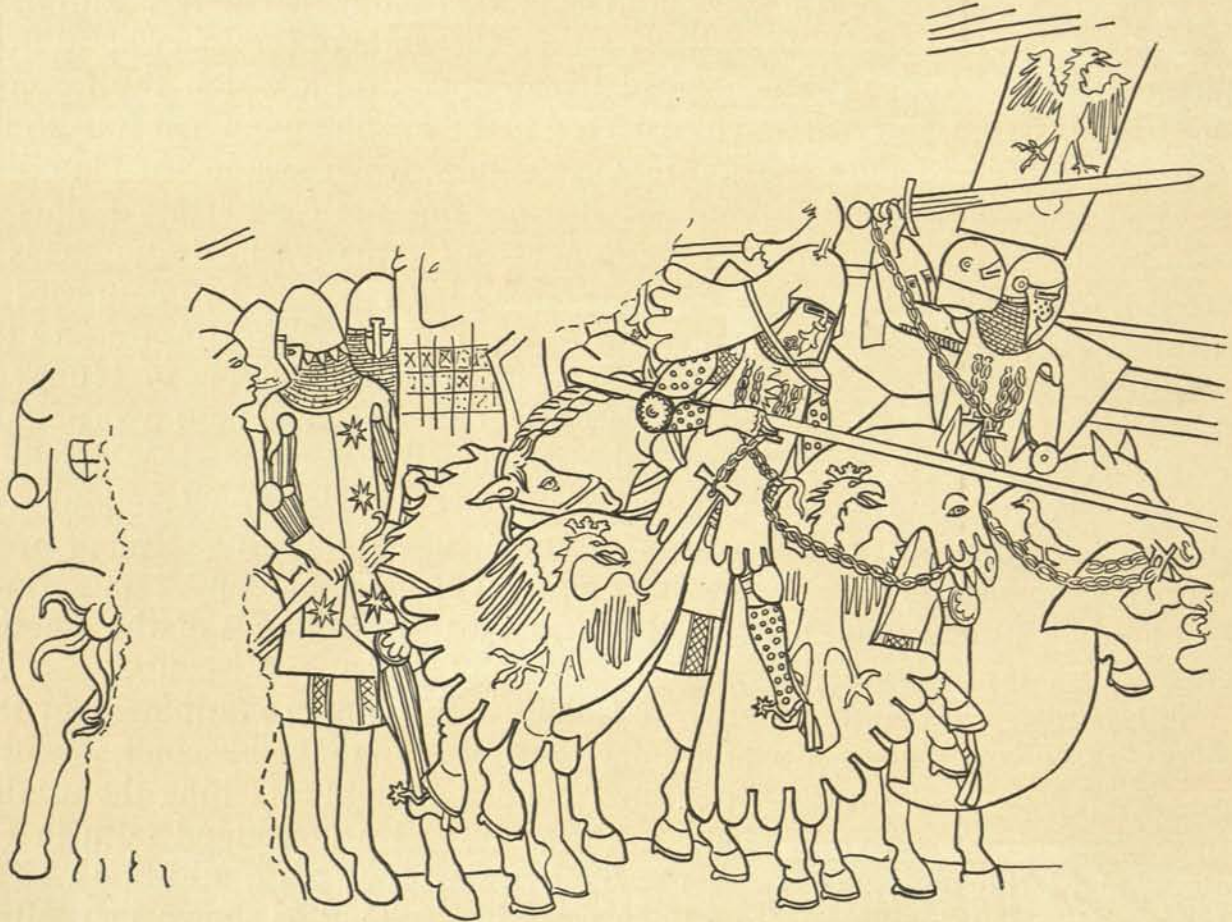


Fig. 1. Left half. Wall painting of battle between Ghibellines and Guelfs in the Castle of Sabbionara, Avio, Upper Adige, mid-fourteenth century.

sufficient quantity, may quite easily mislead us in our conception of what was the usual wear. While *per contra* the equally truthful examples of another pattern may have entirely disappeared in the vicissitudes of time. In England the alabaster quarries of the Midlands produced a type which became the model for the whole country in the later fourteenth and fifteenth centuries. But in Germany the numerous centres of freestone sculpture were more scattered and unco-ordinated. It is true that ample corroboration of the English alabaster type of armed figure is afforded by the evidence of the other crafts. Brasses, wood-carvings, glass, and painting all tell the same story. But even here there is the possibility of collusion. An artist in another material may have found it easier to take for his model of an armed knight the effigy recently set up in the parish church than an actual armour, which in



Fig. 1. Effigy of Dieter von Hohenberg, †1381, from Burg Hohenberg, Grosseheim. In the Bayr. Nationalmuseum, München

Photo. A. Reusch

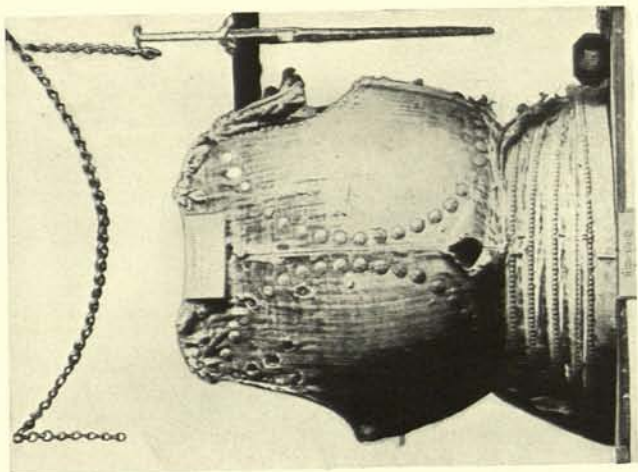


Fig. 2. Belt, and breastplate of iron covered with red velvet, XIV-XVth century, in the Bayr. Nationalmuseum, München

Photo. A. Reusch

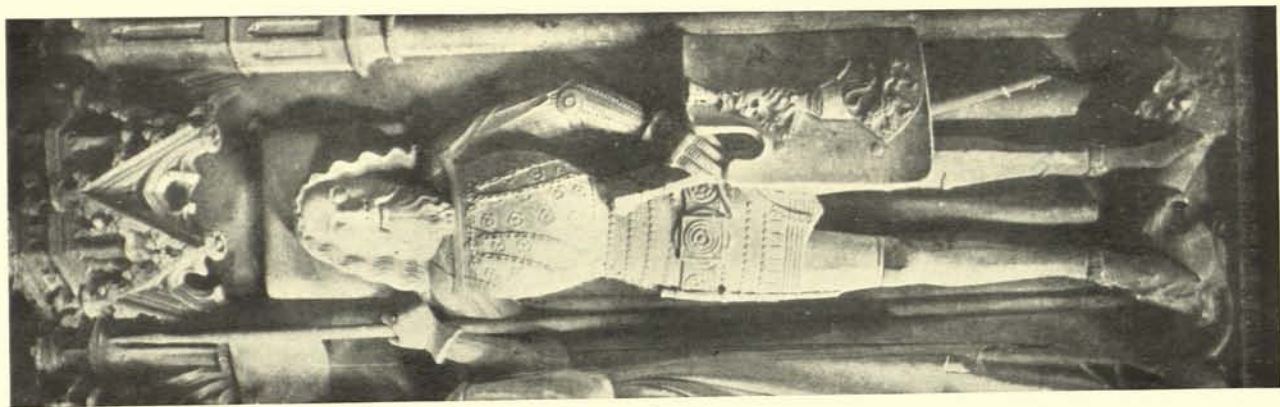


Fig. 3. Effigy of Günther XXV von Schwarzburg, †1368, in the Liebfrauenkirche at Arnstadt



Photo. Oesterr. Lichtbildstelle

Fig. 1. St. Oswald. Painting on panel by a Styrian master, c. 1440, in the Johanneum, Graz



Photo. Christof Müller

Fig. 2. Effigy of Graf Moritz von Oldenburg, †1420, in the Church at Rastede. From a cast in the Germanisches Museum, Nürnberg

England he probably seldom saw. The comparatively peaceful internal history of the country between Boroughbridge and the Wars of the Roses must have made the wearing of armour much rarer here than in Germany, where private

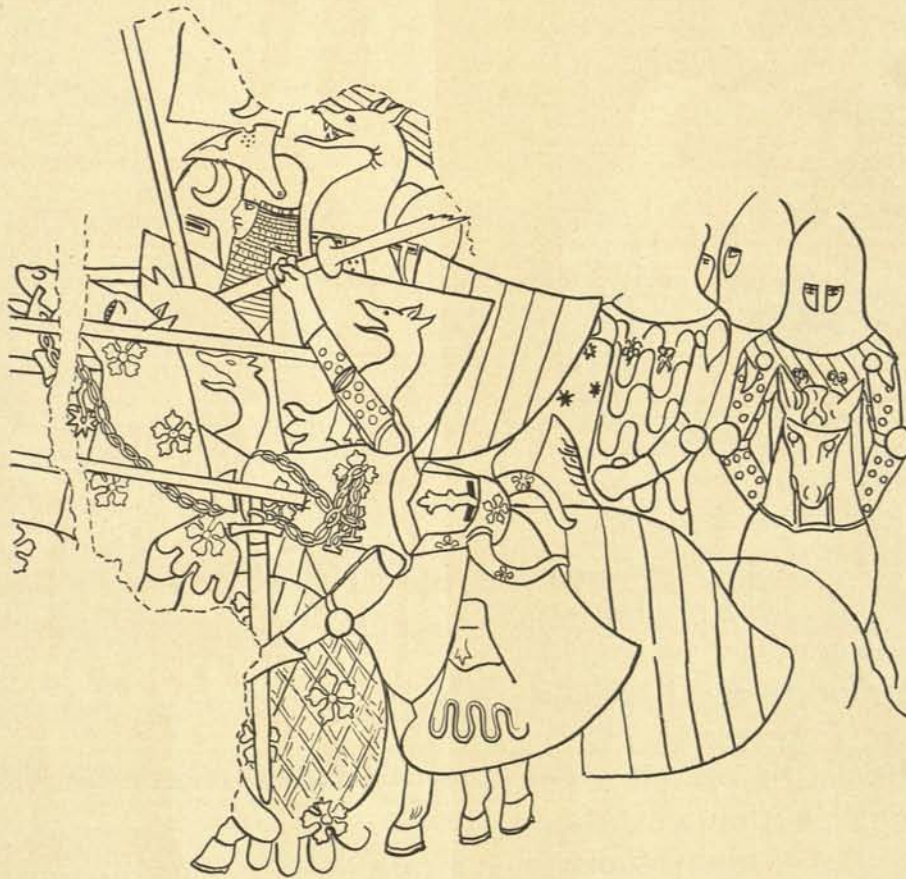


Fig. 1. Right half.

warfare was the order of the day. The English country gentleman in his manor had little occasion to don his armour or need to renew it, unless he served at court or in the wars in France and on the Border. But one may well believe that the German *Freiherr* in his castle slept with the key of the armoury under his pillow. It is possible that the variety of German representations of warlike gear is due in part to the fact that the artists had it constantly before their eyes with all the idiosyncrasies of individual wearers. While another factor which contributed largely to the variety of armament at this date was the diversity of materials employed. In Germany and Italy the greater part of the century was spent in experimenting with combinations of mail, cuir-bouilli, and splints, before 'white' armour of steel was finally accepted. The objection to the last was probably not only the weight of iron, which set men looking for substitutes, but the skill required to adapt it to the

human form. Until the end of the thirteenth century the helm-makers, or heaumers as they are called in contemporary English records, were the only craftsmen working in plate. The rest of a man's harness was supplied by the

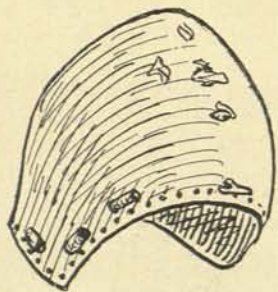


Fig. 2. Bascinet, egg-shaped type. Germanisches Museum, Nürnberg.

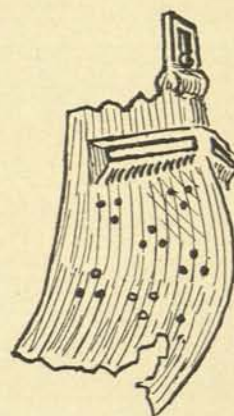
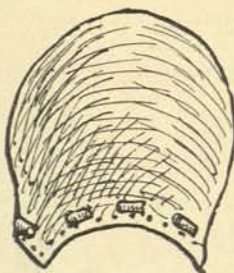


Fig. 3. Klappvisier. Marburg Museum.

haubergiers or mail-makers, and the linen-armourers, the makers of brigandines and quilted defences. To these were now added the platers. This word, which is the English sixteenth-century equivalent of the German term *Plattner*, might usefully be revived where the use of the more general term 'armourer' would be ambiguous.

The invention of the bascinet obviated the redundancy of the *cervellière* and the coif, and eventually relegated the helm to the tilt-yard. It is already shown complete with vervelles and aventail on the series of nine sandstone reliefs from the Kaufhaus at Mainz which was erected in 1318 (pl. xiv, fig. 2). The bascinet in Germany took four forms. The round, egg-shaped type, equipped with vervelles for the aventail, was the first and lasted to the end of the century (fig. 2). The bottom edge at the back is often scooped out to allow freedom of movement. Surviving examples are at Sion,¹ Nürnberg, Berlin, in the Dean Memorial Collection at New York; and one was found during the restoration of Schloss Braunfels. This type is also found in Italy, as, for instance, the two examples from Savoy in the Armeria Reale at Turin (E 1 and 2), while the two in the Poldi Pezzoli collection at Milan have the same vertical, wedge-shaped flanges to protect the vervelles that are shown on the effigy of Günther von Schwarzburg at Frankfurt. Secondly, there is the form rising to an ogival apex as represented by the von Hulshoff example at New York, and that at Coburg (Laking, figs. 283 and 284), and frequently shown on effigies such as that of Peter Creglinger, †1365, at Rothenburg. These two forms usually have the visor hinged to the brow (*Klappvisier*, fig. 3), a practice rarely

¹ Cf. E. A. Gessler, *Die ritterliche Bewaffnung von 1386 zur Zeit der Schlacht von Sempach*, Z.H.W.K., vi, 190-211, 1913.

if ever found in England. Thirdly, there is the international type, nearly vertical behind and rising over the brow in a convex curve to the apex, which is placed slightly in rear. In this case the visor is usually pivoted over the ears and acutely pointed, taking the form known in Germany as the *Hunskugel* which became in contemporary English slang the 'Hounskull'. Laking called them French, and more recently they have been called Swiss, but illustrations of this type are distributed impartially throughout Europe in the second half of the fourteenth century, and incidentally all the English alabaster tombs show this form.¹ Surviving examples such as those at Churburg (nos. 13 and 15), in the Metropolitan Museum, the Wallace Collection, and Musée de l'Armée, are of widespread provenance. There is one, now without a visor, in the Germanisches Museum which was found in Upper Bavaria (fig. 4).

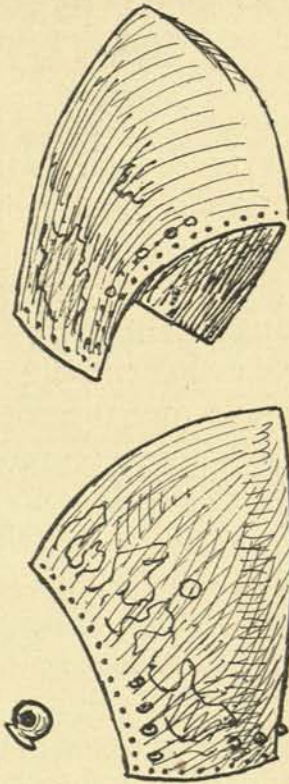


Fig. 4. Bascinet, international type, found in Lower Bavaria. Germanisches Museum.

Lastly, but much more rarely, there is the type believed to represent the *barbuta* of the Italian chroniclers, which comes down low at the sides almost to the neck and curves forward enclosing the face. The opening was defended either by a nasal or a narrow *Klappvisier*. This form is represented as far north as the alabaster and bronze effigy of Duke Christopher, †1363, in the cathedral of Roskilde in Denmark, where the aventail is shown laced inside it.

The war-hat or chapel-de-fer (*Sturmhaube*) was popular in Germany as in other countries during the fourteenth century and until the advent of the sallet. Any one who has experienced the limited vision of a visored helmet will be aware of the advantages of an open headpiece with a brim that will to some extent protect the face. Representations of the Sleeping Guard show war-hats as well as bascinets with *Klappvisiers*, as on the Easter Sepulchre in the Altertumsmuseum in the Grosse Garten at Dresden and in Constance Cathedral. They frequently appear in paintings and manuscripts, but rarely on tombs.²

¹ It is usually shown without the visor, but there are instances, such as on the Stawell effigy at Cothelstone, and that of Thomas Bassett, †1423, at St. Hilary (*Arch. Camb.*, 5th S., vii, 184), where the sculptor has gone to the pains of showing the pivot with its half of the empty hinge. Sometimes the *Klappvisier* was carved *in situ* on German effigies, e.g. those of Rudolf von Sachsenhausen, †1371, at Frankfurt, Eberhard Wolfskel, †1379, at Heiligental.

² An exception is the effigy of Conrad Schenck von Erbach, †1454, formerly at Erbach (Sale, Lucerne, 1932, 65). There is an Easter Sepulchre with good fourteenth-century military detail at Schwäbisch-Gmünd, and cf. B. Engel in *Z.H.W.K.*, ix, 43, 1921, *Laufende Knechte*.

The helm is still in evidence in German sculpture, more so perhaps than in England, where it is usually relegated to the rôle of pillow. In order to display its crest it is frequently held in the right hand, while the left supports the shield or rests on the sword hilt. In the mid-fourteenth-century sculptures on St. Stephen's church, Vienna, a page holds up the crested helm beside the archduke, who is shown uncovered, wearing his crown. Several German helms have survived, such as the Prankh helm and those from Linz, Küssnach, and Tannenberg. Recently the list has been augmented by the small and well-preserved example from the church of Allerheiligen, Kleinschwarzenlohe, which hung over a sixteenth-century tomb of the Kornburg family and is now in the Germanisches Museum at Nürnberg (pl. xv, figs. 1 and 2),¹ and that found at Arnas² in Sweden, while there is the rare leather crest of a pair of horns at Churburg.

If one turns to the clothing of the body one finds the short, tight-fitting jupon less commonly worn than in England. M. Buttin has very carefully described the successive layers of defences worn in the forties in his study of the tomb of Ulrich de Werdt, †1344, at Strassburg. Most of the effigies of this date show short, loose surcoats with mail upon the limbs. The last effigy in England to show mail alone is the brass of Sir John Gifford, †1348?, at Bowers Gifford in Essex, but examples persist in Germany for another thirty years, as for instance that of Ulrich Landschaden, †1369, at Neckarsteinach. The skirts of the surcoat, which becomes much shorter in the forties, frequently reveal that the hauberk was reinforced with a coat of small plates on a textile basis, such as has been found at Wisby in excavating the burial-place of the battle of 1361.³ In the second third of the century one finds hoops of iron round the body as on the effigies at Bopfingen and Orlamünde, which appear to be by the same hand. Actual surviving plates of body-armour of this kind have been found at Tannenberg,⁴ Küssnach,⁵ and Wisby. As in England, it is difficult to be certain when the solid iron breastplate came in, but one may deduce it from the globose profile of the posthumous effigies of the old Bohemian kings from the workshop of Peter Parler at Prague, c. 1380, and one is plainly to be seen with medial

¹ It has been fully described by Dr. A. Neuhaus in *Anzeiger des Germanischen Nationalmuseums*, 1924-25, 89. The Küssnach helm by Dr. Gessler in *Z.H.W.K.*, ix, 22-6, 1921.

² B. Schnittger in *Z.H.W.K.*, ix, 76-8, and *Kungl. Vitterhets Historie och Antikvitets. Akademien Monografiseringen* 16, 'Aranaeus', Stockholm, 1927, pp. 65-76.

³ B. Thordeman, *Acta Archaeologica*, iv, 1933; *Z.H.W.K.*, xi, 129, xii, 201; cf. also Post, *Z.H.W.K.*, xiv, 41. Dr. Thordeman uses the English words 'plate armour' and 'splint armour' to distinguish between the body defence of hoops and that of small plates, but in view of the customary use of these words in armour terminology it will cause less confusion if the former is called 'splints' or 'hoops' and the latter 'brigandine', although this last belongs to an Asiatic variety.

⁴ J. von Hefner and J. W. Wolf, *Die Burg Tannenberg und ihre Ausgrabung*, 1850.

⁵ E. Gessler in *Z.H.W.K.*, x, 211-25; F. M. Kelly, 'Pre-Gothic Cuirasses of Plate' in *Apollo*, July 1930.



Photo. Wolfrum

The Virgin Mary armed and attended by the Powers. Altarpiece of Albrecht II, 1438, at Klosterneuburg

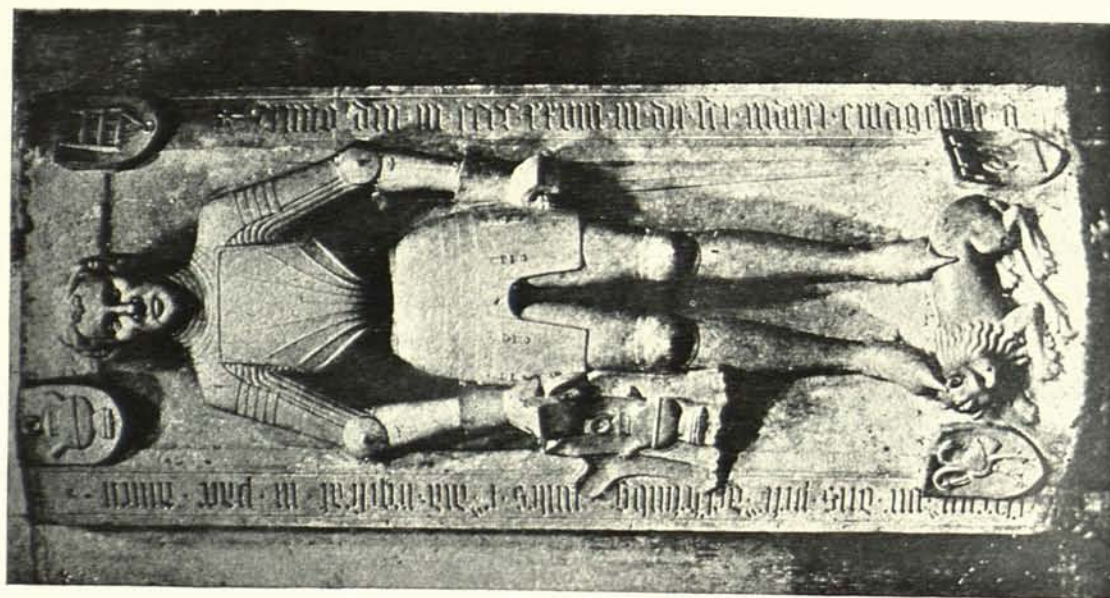
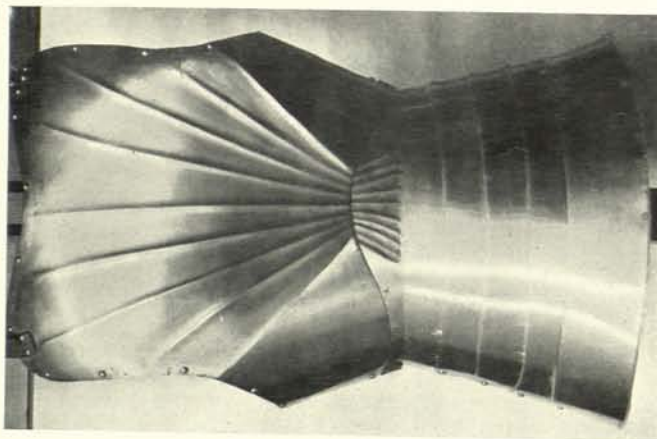
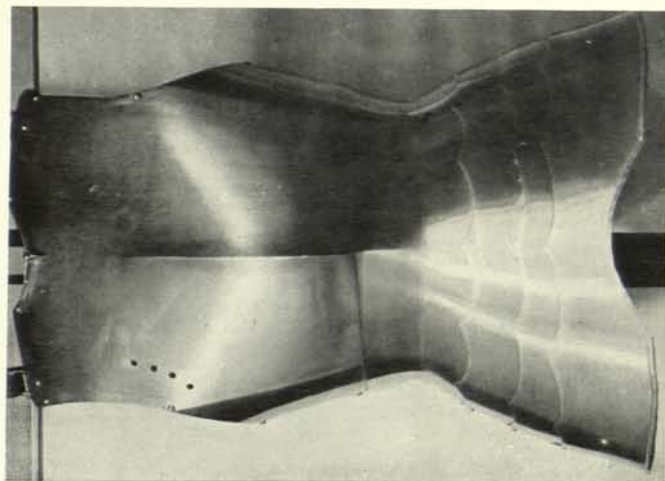


Fig. 1. Effigy of Peter von Stettenberg, †1428, erected c. 1440, in the church of Brombach

Block by courtesy of 'Apollo'



Figs. 2 and 3. Breast with lisière d'arrêt and fluted backplate, c. 1440. In the Rathaus, Vienna

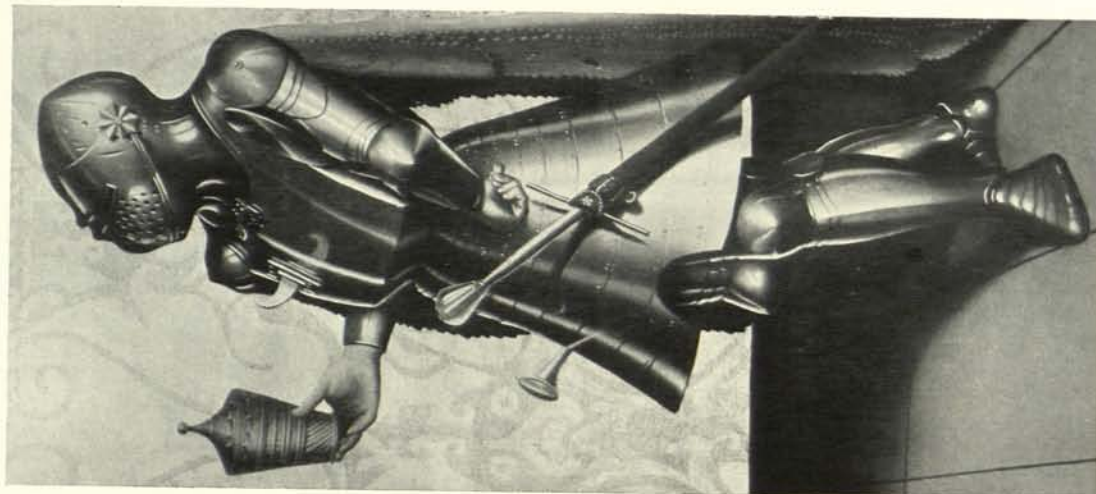


Fig. 4. Sabothai bringing water to King David. Detail of the painting by Conrad Witz, c. 1440, in the Gallery at Basel

Photo, Hanfstängl



Photo, Berberich
Fig. 1. Effigy of Carl von Eberstein, †1497,
Gumbertuskirche, Ansbach



Kunstgesch. Seminar, Marburg
Fig. 2. Effigy of Ludwig I, Landgraf von
Hessen, †1458, by Meister Hermann, 1471.
Church of St. Elizabeth, Marburg



Photo, Berberich
Fig. 3. Effigy of Sigmund von Lentersheim,
†1460, Gumbertuskirche, Ansbach

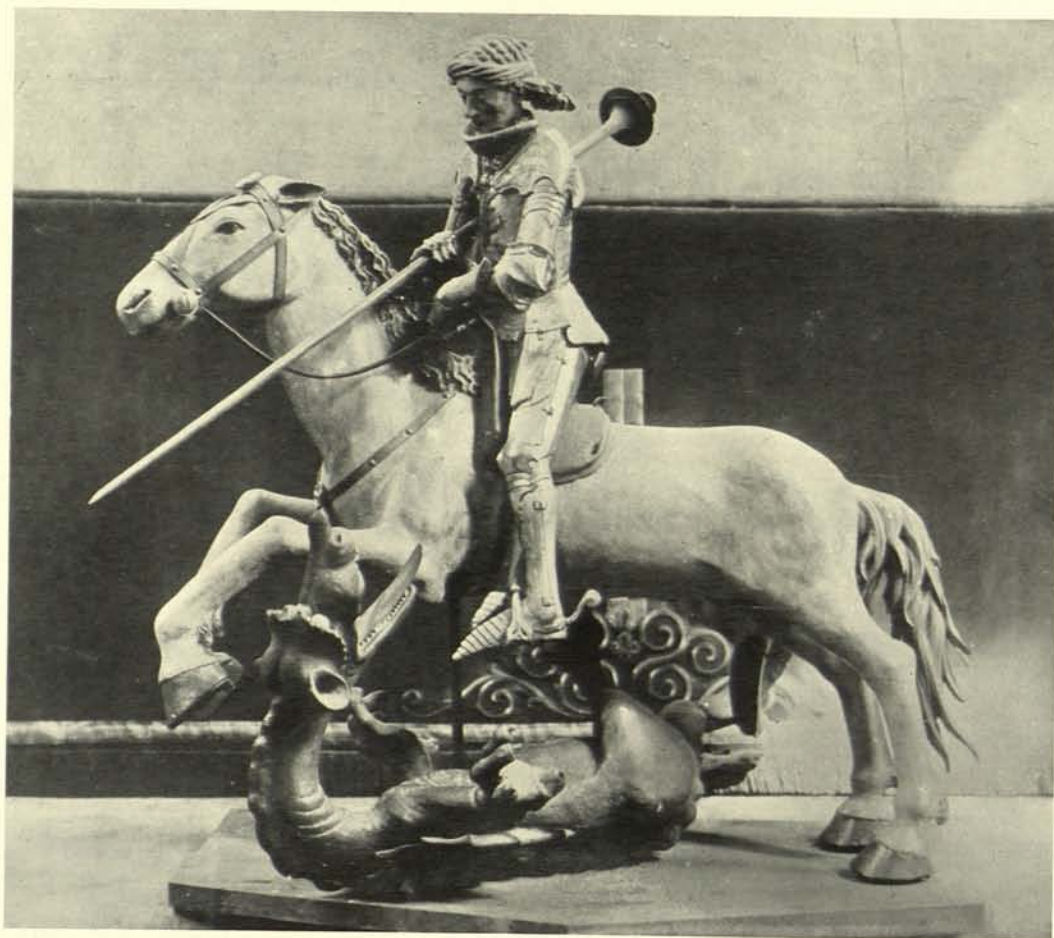
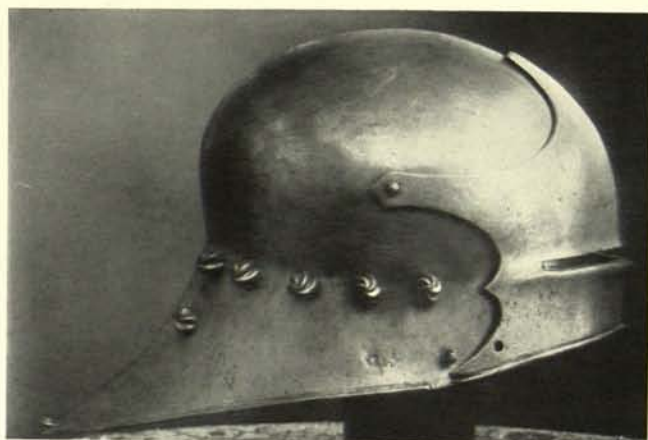


Fig. 1. Wooden Statuette of St. George and the Dragon, Chapel of the Order of the Swan, Gumbertuskirche, Ansbach, late 15th century



Figs. 2 and 3. Two Sallets, c. 1480, Chapel of the Order of the Swan, Gumbertuskirche, Ansbach

ridge on the effigy of Beringer von Berlichingen, †1377, at Schöntal an der Jagst. Hefner was mistaken in assuming it to have been of leather in such cases. The skirt was either of mail, scales, hoops, or studded brigandine. The breast of Günther XXV von Schwarzburg, †1368, at Arnstadt (pl. xvi, fig. 3) is globose and freely studded, and it is possible that the textile-covered breast in the Bayerisches National Museum at Munich (pl. xvi, fig. 2) dates from this time instead of from the fifteenth century, to which it has been assigned. Quilted jupons are shown on the effigies of Peter Creglinger¹ at Rothenburg ob der Tauber and on those of Theodorich von Lichenperg, †1366, at Erfurt and Theodrich von Witzleben, †1376, at Arnstadt. The tight-fitting jupon, when worn, was often laced down the front,² whereas in England it is almost invariably shown laced at the side.

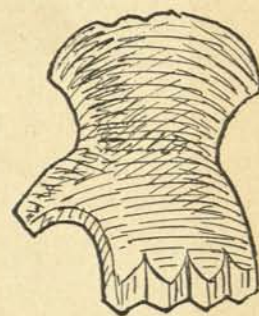


Fig. 5. Gauntlet, fourteenth century. Germanisches Museum, Nürnberg.

The arming of the limbs in the second half of the century offers great variety. Before the invention of the turning joint one can easily understand the reluctance to encase the arms in plates that could only give lateral movement to the cubitus by the play of the leathers, or by keeping rerebrace and vambrace independent, in which case the full weight of the latter was carried by the forearm. Arms in mail only are still shown on the effigies of Rudolf von Sachsenhausen, †1370, at Frankfurt, and Otto von Pienzenau, †1371, at Ebersberg (cf. pl. i, fig. 3). Narrow strips of steel are shown attached by points to the mail sleeves of Gottfried von Arensberg, †1370, at Cologne. The same feature was once visible on the English effigy of Sir Guy Brian at Tewkesbury.³ They would be sufficient to stop a sweeping cut and were still in use in the fifteenth century.⁴ With the mail sleeves were worn the short, bell-cuffed gauntlets common to all countries at this time, and a few examples have survived (fig. 5 and see Appendix I).

Another method was to encase the arms and legs in a leather defence reinforced with longitudinal strips of iron sometimes interspersed with studs.⁵ This is clearly shown on both the arms and legs of Günther XXI von

¹ P. Post in *Z.W.H.K.*, xi, 156.

² For instance, on the standing figure of St. Wenzel in Prague Cathedral. Weigert, *Marburger Jahrbuch für Kunstwissenschaft*, iii, 88.

³ Stothard, *Monumental Effigies of Great Britain*, 1876 edition, note by J. Hewitt.

⁴ This type of defence can be seen in the engraving by the Master of the Boccaccio Legend, *The Death of Regulus* (Passavant, ii, 276, 8) and *The Death of Brunhilde* (ibid., 276, 8). Cf. on this point *Archaeologia*, lxxxiii, 290, note 1.

⁵ There are two English instances on the brasses of Thomas Cheyne, †1368, at Drayton Beauchamp, and Sir Miles de Stapleton, †1364, formerly at Ingham, Norfolk. Compare also the relief of Sir Giles Daubeney, †1346, at Brize Norton, Oxon.

Schwarzburg, the short-lived King-elect of the Romans who died in 1349, and whose red sandstone effigy, unfortunately freely repainted, is in the Cathedral at Frankfurt-am-Main. It can also be seen on the limbs of Beringer von Berlichingen, †1377, at Schöntal, the Hohenberg Knight, †1381 (pl. xvi, fig. 1), and on many others, even into the fifteenth century, and on the wall-paintings at Sabbionara (fig. 1). It may be remarked here that Hefner's reconstruction of the original painting of the tombs must be accepted with caution. It is possible that sometimes these metal strips were laid upon mail, as on the arms of Günther XXV von Schwarzburg, †1368 (pl. xvi, fig. 3), and the legs of Sir Guy Brian at Tewkesbury. Sometimes the vambraces are continued to cover the elbow (pl. xvi, fig. 1) to obviate couters, but articulated plated arms of the kind found in England at this time also occur, as on the effigies of Hans von Ybbs, †1368, and Hennel von Landschaden, †1377.

A number of shields has survived from this period, and Marburg can boast no less than eleven of the flat-iron form (see Appendix I) with their charges applied in painted gesso. The deeply bouched shield arrived in Germany in the second half of the century (pl. xvi, fig. 3) shortly before it made its appearance in England,¹ though its use was for heraldic display rather than war. For fighting purposes the shield was henceforth confined to the foot-soldier, and several existing pavises such as those from Erfurt date from this time.

The first quarter of the fifteenth century is really a continuation of the fourteenth. The splints and studs gradually drop out in favour of plate. The chief difference so far as the appearance of the wearer is concerned is the increasing use of textile embellishments which hide and sometimes wholly obscure the armour. There was a fashion for enormous sleeves, either long and slittered or wide and voluminous (pl. xvii, fig. 2). This is in marked contrast to the contemporary fashion in England, where the attenuated jupon was finally dropped, revealing the austere outline of the 'all-white' harness, as for instance on the brass of Sir Thomas Swinborne, †1412, at Little Horkesley. It is true that sleeves are represented on the York chest and on other examples of woodwork in England (sometimes suspected of Flemish influence), but the brasses and effigies are invariably without these appendages. The German effigies also show tassels and bells hung upon cords from the girdle. Helmets are doffed and their place is taken by huge hats and bonnets. The breastplate is often shown attached independently by points over the full-skirted and sleeved tunic, beneath which was the hauberk, and in form it is globose and sometimes protuberant in the lower part. The arms, where visible, are of plate,

¹ An early instance of the bouched shield in England appears on a misericord of two knights jousting on the stalls of Worcester Cathedral. M. D. Anderson, *The Medieval Carver*, 1935, pl. IV B.

and the gauntlets are of the mitten variety very similar to the Italian style. The legs are enclosed in complete greaves and sabatons.

By the thirties the textile embellishments begin to disappear and reveal a homogeneous white harness instead of an assembly of disjointed elements. This is depicted with much minuteness of detail by Conrad Witz in his painting of Sabothai and Benaia bringing water to King David, in the gallery at Basel (pl. XIX, fig. 4).

The interesting painting of 1438 from the altar of Albrecht II at Klosterneuburg (pl. XVIII) shows the Virgin Mary in the unusual guise of a warrior, with a broad-brimmed war-hat upon her flowing hair, a breastplate over her gown, beneath which is a shirt of mail, rerebraces attached by points to her shoulders, and gauntlets, greaves, and sabatons. More armour is hanging on a pillar; a shield, a war-hat ('chapeau de Montauban'), a sword, spurs, gauntlets and vambraces, a breastplate, leg-harness, and a crossbow. This and the Virgin's breastplate are bordered with latten. It will be noted that there is no backplate, which was probably omitted when the breastplate was attached separately to the *Waffenrock* by points, as one sees on so many effigies of this time. Around her are the four winged Potestates, or Powers, in full armour. Two wear war-hats, one of them with the brim cut out in front, of a type later familiar in the pictures of Hieronymus Bosch. The breastplate on the left is decorated with flutes, and both wear very deep skirts of lames. The Powers behind wear visored bascinets, one with a bevor and one with aventail. The very deep skirt is a feature of the second quarter of the century and must have necessitated riding with a high-pitched saddle and a straight leg. This custom is depicted in the charming little painting of St. George and the Dragon, of the school of van Eyck, which was lent to the Exhibition of Flemish Art in London in 1927 (no. 20) by Lady Evelyn Mason. The breastplate was usually full in the lower part, as on that at Churburg, no. 14, or sometimes boxed. Occasionally it was boldly fluted. This was not the first time that a feature generally associated with the early sixteenth century was anticipated.¹ Fluted bascinets are shown on the younger D'Abernon and Creke brasses in England and on the late fourteenth-century alabaster effigy of Sir Gronw ap Tudor at Penmynydd in Anglesey. Both fluted and boxed breasts are shown among the Christian warriors in van Eyck's polyptych of the Adoration of the Lamb at Ghent. Fluted breasts were repeatedly used by Hans Multscher and his school,² both in painting and sculpture, and there is a close resemblance between that in his painting of Christ before Pilate at Berlin and the armour of the effigy of

¹ Cf. F. M. Kelly, 'Some Early "Crested" Armours' in *Apollo*, Sept. 1930.

² K. Gerstenberg, *Hans Multscher*, 1928, *passim*.

Conrad von Weinsberg, †1446, at Schöntal an der Jagst.¹ They can be seen too on Multscher's statues from the Rathaus at Ulm, now in the Museum, and in the paintings of St. George at Scharenstetten and of St. Oswald at Graz (pl. xvii, fig. 1). The effigy of Wilhelm von Oberdorf, †1452, at Spandau shows it very clearly along with circular fluted besagues and a deep skirt of lames.

There is less actual armour surviving that can be attributed with certainty to the first half of the fifteenth century than to the preceding one. There is the well-known war-hat, in contemporary English slang 'kettle-hat', from the Hefner-Alteneck Collection and now in that of Major the Hon. J. J. Astor (Laking, fig. 415) bearing the mark of a fleur-de-lys, which is stated to have come from a castle on the Rhine. There seems no particular reason to call it Swiss, as Hefner did, nor need one date it as late as 1440-80, for an exactly similar hat is depicted in a painting of the Westphalian school of the Resurrection in the gallery at Brunswick, which on other evidence must belong to the very first years of the century. There are two other war-hats less well preserved in the Landesmuseum at Zürich which were found in the ruins of the castles of Werdegg and Moosburg destroyed in 1443 and 1444.²

Sir Guy Laking has illustrated several of the 'great' bascinets of this period with round-faced visors. The rounded visor succeeded the pointed 'hounskull' in the first half of the fifteenth century, though the latter still figures in paintings and miniatures, and the aventail unreinforced by a plate gorget appears as late as on the effigy of Philip von Ingelheim, †1431, at Oberingelheim am Rhein. There is a round-faced bascinet in the Musée de l'Armée (H. 22), and a detached visor of this kind in the Rössman Collection in the Bargello, both of unknown provenance. Laking included the rare helmet from Fürstenwalde, now in the Zeughaus at Berlin, among the 'great' bascinets, but it is really an early armet, with hinged cheeks opening down the chin, and has been compared by Oswald Graf Trapp to that on the effigy of Dietrich Hofer, †1416, at Straubing.³ The armet, however, found much less favour in Germany than in Italy in the fifteenth century, and it was the long-tailed sallet with a bevor which became the characteristic German head-piece of the second half of the century.

Of surviving body armour one must mention the breast from the Hefner-Alteneck collection, and later in that of Dr. Bashford Dean, although it may not be quite as early as has been suggested. The Nürnberg guild-mark does

¹ *Archaeologia*, lxxix, pl. LXVII, fig. 1.

² Compare the fragment in the Landesmuseum Nassauischer Altertümer at Wiesbaden, W. Wilbrand, in *Z.H.W.K.*, vii, 270, and that in the Kuppelmayr Sale 1895, 72, said to have been found in the Isar above Munich.

³ *Z.H.W.K.*, xi, 25; and P. Post, *ibid.* vii.

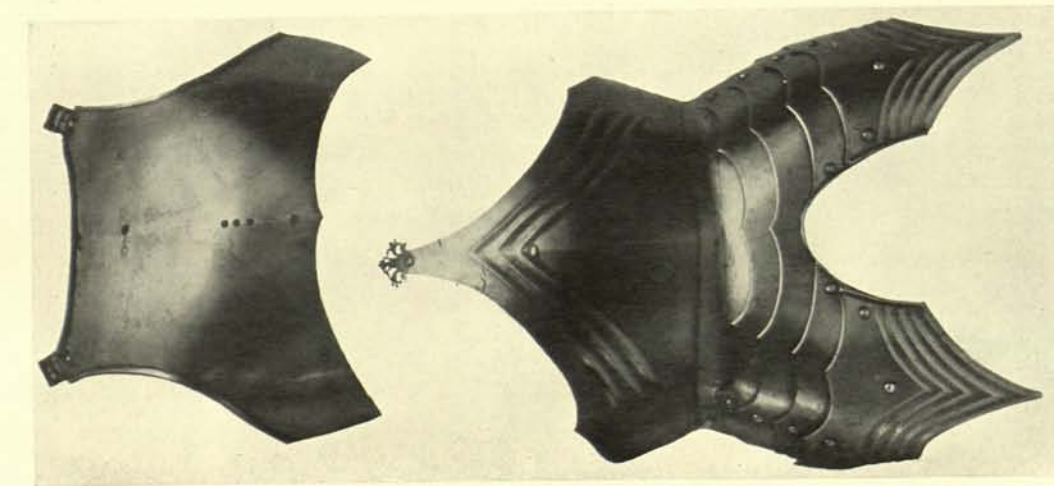


Fig. 1

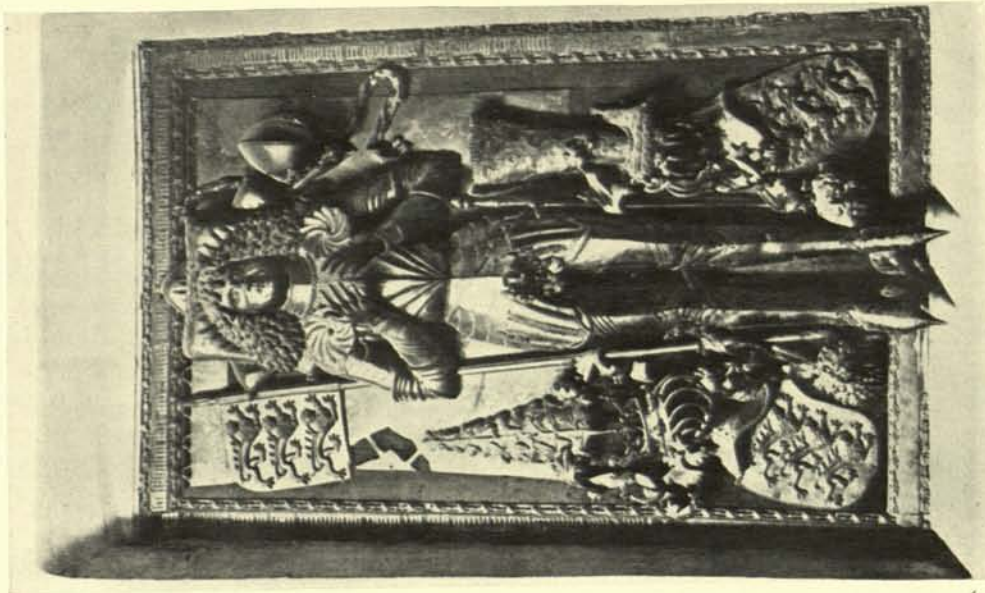


Fig. 2

Fig. 1, 3, 4. Breast, tassets, sallet, and beaver of the Gothic armour from Schloss Hohenaschau, Wallace Collection, No. 620

Fig. 2. Bronze effigy of Jörg Truchsess von Waldburg, †1467, in the church at Waldsee. Franconian School

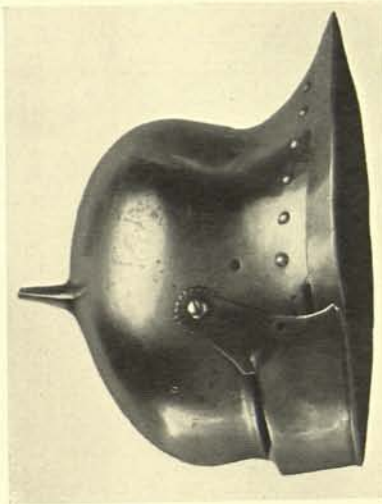


Fig. 3

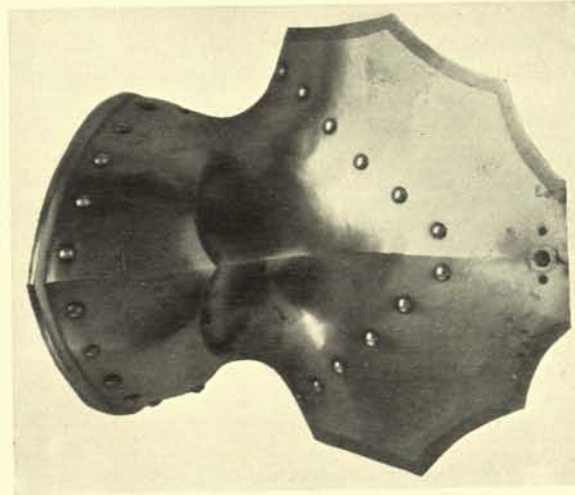
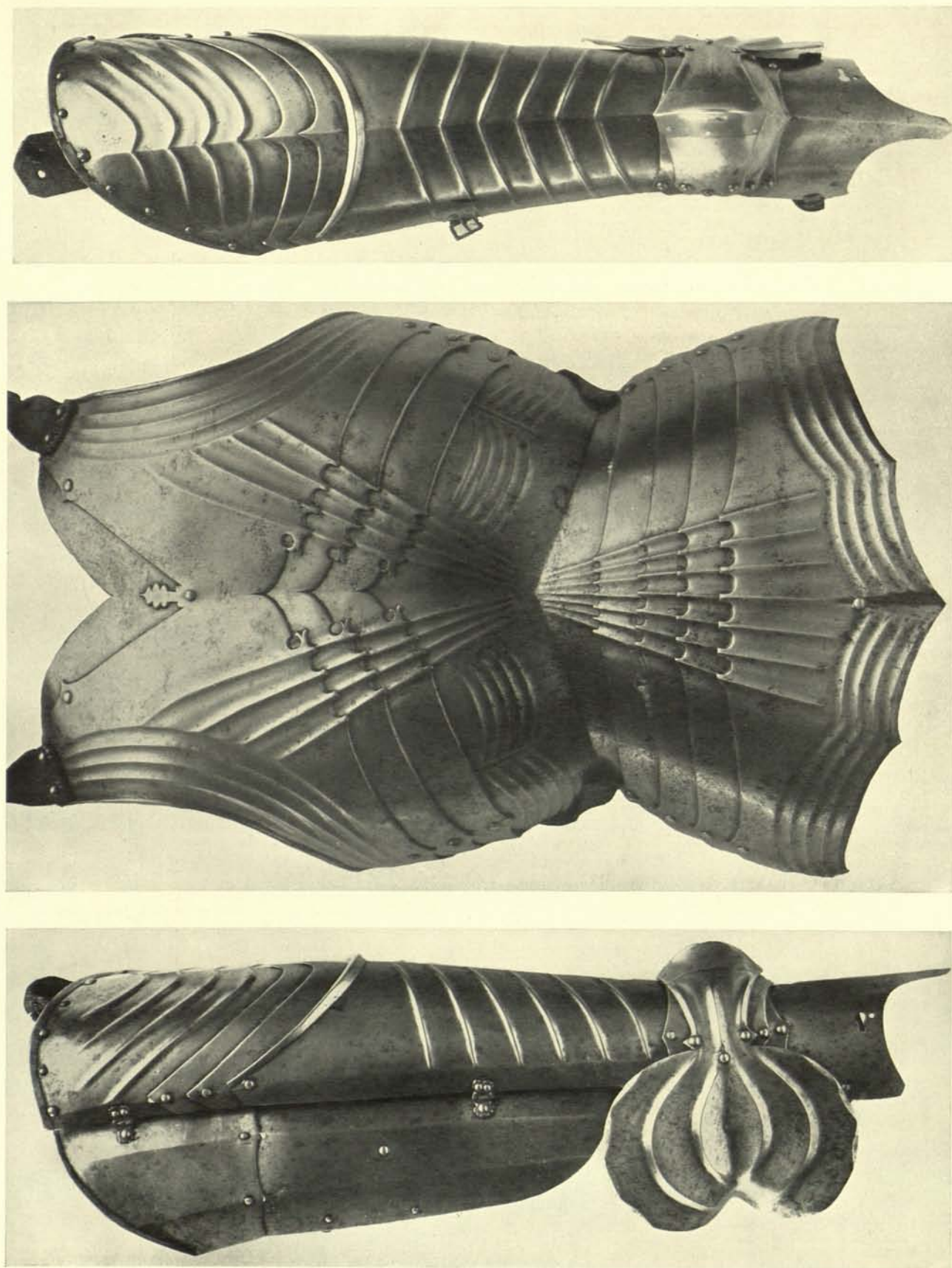


Fig. 4



Cuirasses and backplate of the Gothic equestrian armour from Schloss Hohenaschau, Upper Bavaria, in the Wallace Collection, No. 620.
The cuirasses and knees bear marks at present unidentified

Published by the Society of Antiquaries of London, 1935

not seem to have been applied to armour until the second half of the century, and the pair of small holes close together in the centre of the top, found on many plain breasts of the time of Maximilian, is a point in favour of a later attribution. But the writer has not had the opportunity of seeing and handling this breastplate and so must reserve judgement. There is, however, a breastplate at Churburg (no. 16), which certainly belongs to this time, with a forked *lisière d'arrêt* applied to the upper part of the chest. The same feature can be seen on a breastplate in the Rathaus at Vienna (pl. XIX, figs. 2 and 3) which has a broadly fluted back very similar to the fluting on the effigy of Peter von Stettenberg, †1428, at Brombach (pl. XIX, fig. 1), which was probably erected at the same time as that of his son, †1441, to which it bears a strong resemblance. Dr. A. Grosz, the Director of the Waffensammlung of the K. H. Museum, informs me that all its main plates are original though restrapped, and that it comes from the old Imperial Arsenal. It therefore constitutes a rare and interesting survivor. At Zürich there is a short-sleeved hauberk that was found in the ruins of Schloss Wildberg, which was destroyed in 1443.

The shortening of the deep skirt of lames and the addition of a pair of tassets attached by straps, the division of the breast into two parts, the lower one rising in one or more cusps, and the adoption of the sallet and bevor were the principal modifications which, in the middle of the century, produced the particular style of white harness called Gothic. This use of the term is even more arbitrary than in architecture, where it at least has a respectable antiquity. Its application to a much briefer period in the history of armour was suggested by the finials and cuspings, the attenuated lines and pierced borders in harmony with the northern architecture of the time, which distinguished the highly skilled productions of the South German plater (fig. 6). Had it not been for this, there would be no particular reason to apply the word to the contemporary Italian style, which, with its rounded outline and plain surfaces, is quite at home in the paintings of the early Italian Renaissance. The similarity which had existed between German and North Italian armour of the fourteenth century gave way in the next to clearly marked national styles evolved by the concentration of the craft in fixed industrial centres. The term was adopted when national and local characteristics in armour were as yet hardly recognized, and is now universally used to cover the years between c. 1440 and 1500, though occasionally it is extended abroad to denote any pre-Renaissance plate armour.

The sallet in Germany is definitely a compromise between the bascinet and the war-hat. This is clearly seen in the bell-shaped form¹ which has the

¹ Laking, *op. cit.*, figs. 331 and 333.

sight cut in the forward brim. The Italian, so-called 'Venetian', sallet on the other hand is a development of the 'barbuta'. Sir Guy Laking has illustrated representative specimens of all its forms and there is no need to repeat them



Fig. 6. Detail from an heraldic drawing. S. German, c. 1480. Albertina, Vienna.

here, except to note that many of those which he described as in the French fashion are in fact the purest German.¹ When in doubt Sir Guy had a tendency to call French anything with a pleasingly elegant outline, and he so described the well-known equestrian armour in the Wallace Collection (pls. xxii, xxiii, xxiv), which will be referred to later. Mr. S. J. Camp has since very satisfactorily shown that it came from the armoury of the von Freyberg family in their castle of Hohenaschau in the Bavarian Alps.

In determining the chronology of German Gothic armour, which exists in much greater quantity than that of the preceding eras, one is assisted by a wealth of contemporary evidence in painting, sculpture, and engraving. This is the era of Bartholomäus Zeitblom, of Michael Pacher,² Peter Vischer, and Tilman Riemenschneider. They neglected no opportunity of reproducing the distinctive outlines and ingenious construction of the armour of this epoch. One noticed in the Spanish paintings and tapestries that brigandines and light helmets were commonly shown, and only the leaders depicted in white harness,

but in German fifteenth-century art the latter is the rule. When Michael Wohlgemuth wished to illustrate in the *Schatzbehalter* the scene of Moses and the Burning Bush, he drew the Hebrew patriarch kneeling in full Gothic armour with his face concealed by a visored sallet and bevor, and lying beside him the long-toed sollerets and spurs which he had removed at the divine command. Though it is highly unlikely that every common soldier wore a *cap à pie* armour as shown in many pictures of the Massacre of the Innocents, it is reasonable to

¹ Laking, *op. cit.*, figs. 366, 367, 368, 375, 376 are German. Fig. 361, also called French, bears a Milanese mark.

² His two figures of St. George and St. Florian on the great altar-piece at St. Wolfgang, 1481, are excellent representations of German Gothic armour. Bernt Notke's great figure of St. George (1489) in the Storkyrkan at Stockholm is another striking example, but overloaded with jewels, which tend to obscure the lines of the harness.

believe that with the centres of production near at hand German commanders saw to it that their armouries were well furnished, not only for themselves, but for their retainers, to which the amount of surviving portions of Gothic armour bear witness.

Many works of this time are specifically dated, which is more satisfactory than the dates of demise upon tombs, and enables one to see that differences in certain details of armament are often due to variations of taste and not of time. It was a matter of choice whether one wore light rerebraces with besagues, or pauldrons, whether the arms were enclosed in canons or only protected by plates on the outer sides. A good instance of alternative fashions of arming is provided by the two statues of Hans and Georg Schenck von Erbach, which were erected together in the little church of Michelstadt in the Odenwald on the death of the second in 1481. They wear different types of sallet, one with the sight cut in the forward wall, and the other with movable visor in a separate piece. One has pauldrons, the other rerebraces with besagues. These and other differences show that the sculptor knew enough of the actual structure of armour to vary his design on two statues otherwise similar in composition. Sometimes a large, round besague is shown on the left arm-pit only. These differences in form must have been due not only to the tastes of wearers, but to the style of individual armourers. Tassets of a single plate were at first usual, but in the last thirty years of the century were often dispensed with.

The mature Gothic style with its shell-like ridgings and romantic lines is already fully developed on the bronze tomb of Jörg von Waldburg, †1467, at Waldsee (pl. xxii, fig. 2), and rippled surfaces and brass edgings appear in a picture in the gallery at Augsburg dated 1477. An even better known bronze is that of Otto IV von Henneberg, cast by Hermann or Peter Vischer between 1480 and Otto's death for the family chapel in the church of Römhild. The date of decease seems to have been added after erection and contains a curious error; the figures LXXXXXII should probably be read as LXXXXVI. The armour is typical of the best work of the time, though the wings of the couters are a little unusual. Every detail is executed with minute care, without in any way detracting from the inspiring effect of the whole as a work of art.

There is a drawing of St. George by an anonymous Nürnberg artist, dated 1481, in the collection of Prince Liechtenstein at Vienna (pl. xxvi, fig. 1). The form of the breastplate, with its double articulation and the borders cut into fleurs-de-lys, can be matched by an armour in the Rathaus at Vienna. Here, as in other instances of the last quarter of the century, tassets have been dispensed with, and the cuisses are made to extend in a series of cusped laminations far up the groin. Similarly the vambrace was sometimes replaced by extending the cuff of the gauntlet to the elbow (pl. xxiv, fig. 2).

The effigy of Dietrich von Berlichingen, †1484 (pl. xxv, fig. 2), in St. Francis's church at Rothenburg shows the bandaging of the head and jaw to take the pressure of sallet and bevor. The surfaces of the plates are elegantly fluted in that rippled¹ form which distinguishes the Gothic from the Maximilian style, and a pair of well-formed tassets are suspended from the skirt of lames. A kind of bonnet that was worn under the helmet is also frequently shown in woodcuts of the time.

The chapel at the east end of the church of St. Gumbert at Ansbach contains the monuments and hatchments of several members of the short-lived Order of the Swan.² Two of them are illustrated here (pl. xx, figs. 1 and 3), as well as the spirited wooden group of St. George and the Dragon (pl. xxi, fig. 1), and two excellent sallets, which, however, are not part of the hatchments, but found their way there during the last century. The laminated tassets of Carl von Eberstein, †1497, are a development of the closing years of the century, and foreshadow the next era. As in many other cases the sabatons are not shown, since the extreme length to which fashion had promoted them made it only possible to wear them when mounted. Another chapel which contains a wealth of fifteenth-century military tombs is in the church of St. Elizabeth at Marburg (pl. xx, fig. 2).

Mention has already been made of the armour from Hohenaschau in the Wallace Collection (no. 620). It is here reproduced in its component parts so that they may be more easily seen (pls. xxii, xxiii, xxiv). The pauldrons and gauntlets, which are restorations made before 1868, and the finely modelled greaves, which are original, have been omitted. Unfortunately the restorer attempted to gild the lily by adding brass borders to the sallet and bevor, and by inserting in the poleyns brass plates which never originally existed. But in spite of this it remains, after the suits of the two archdukes of Tyrol, Sigismund and Maximilian, at Vienna, one of the best representatives of its type, and has the unique distinction of possessing its contemporary bard or horse-armour.³ The main

¹ It is to be noted that, although English effigies and brasses of the middle years of the fifteenth century usually show armours of Italian lines, there are many of the alabaster tombs which show rippled and fluted surfaces clearly influenced by German-made armour, as for instance that of Sir J. Chidiock, †1446, at Christchurch Priory.

² The order was founded by Frederick II, Margrave of Brandenburg and Ansbach, in 1440, and in 1485 a separate South German branch was established by the Elector Albert Achilles at Ansbach. The order came to an end in 1525. The insignia of the order is illustrated in Heideloff's *Ornamentik des Mittelalters*, 1843-55, Heft ix, pl. vii. There is a specimen in the treasury of the Cathedral at Basle, and one was in the possession of the ex-German Emperor.

³ Dr. Stöcklein has suggested that the mark on the chanfron is that of Matthes Deutsch of Landshut. The bard G. 545 mounted with the Gothic harness G. 1 in the Musée de l'Armée does not belong to it, and came originally from the arsenal at Strasbourg. There is a bard in the Rathaus at

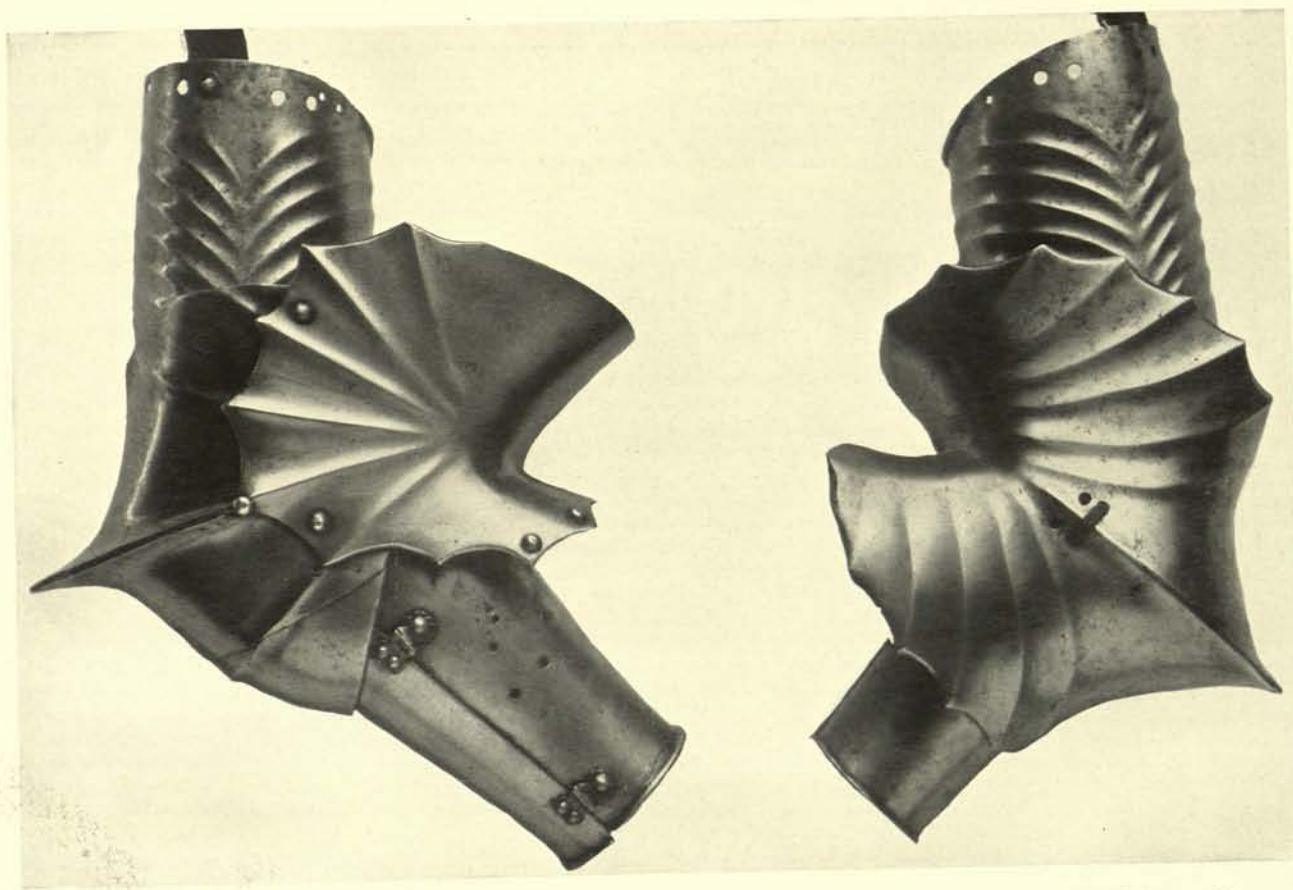


Fig. 1. Arms of the Gothic equestrian armour, No. 620, in the Wallace Collection, from Schloss Hohenaschau

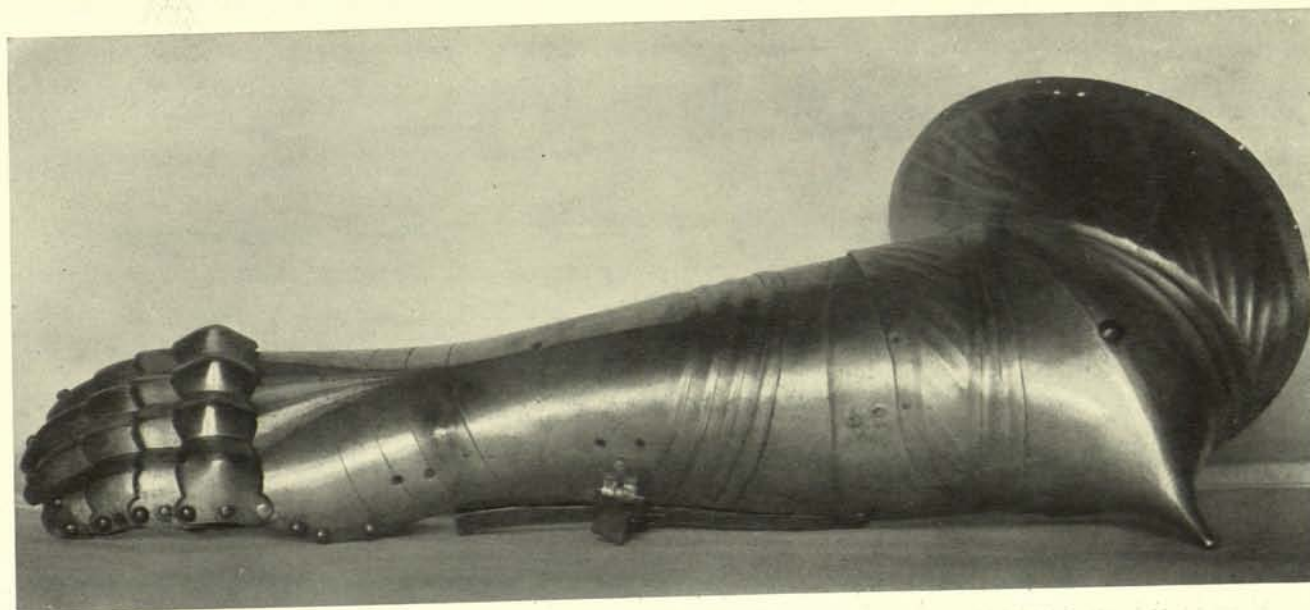


Fig. 2. Vambrace and gauntlet combined, c. 1470. Traditionally of Charles the Bold, Duke of Burgundy.
Waffensammlung, Vienna, No. 108



Fig. 1. Wooden Statuette of St. George and the Dragon. South German, c. 1480. Victoria and Albert Museum



Fig. 2. Effigy of Dietrich von Berlichingen, †1484, in the church of St. Francis, Rothenburg-ob-Tauber

Photo. K. Luft

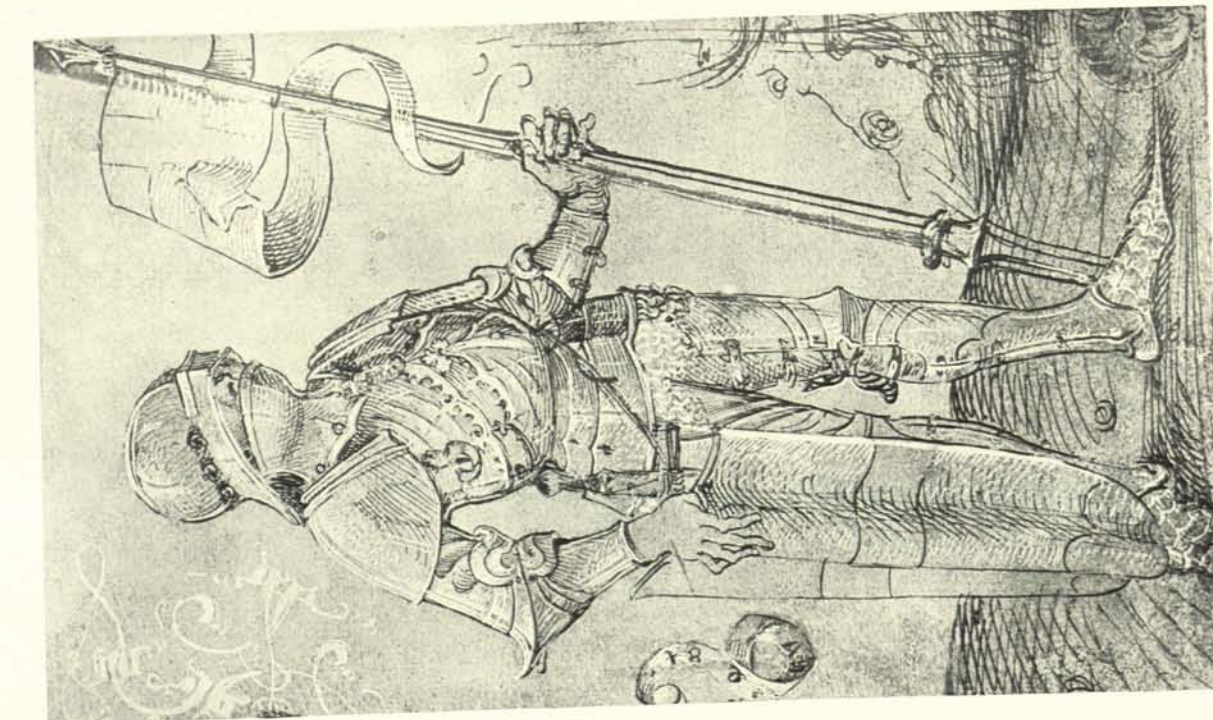


Fig. 1. Drawing of St. George and the Dragon, South German, dated 1481. Prince Liechtenstein Collection, Vienna

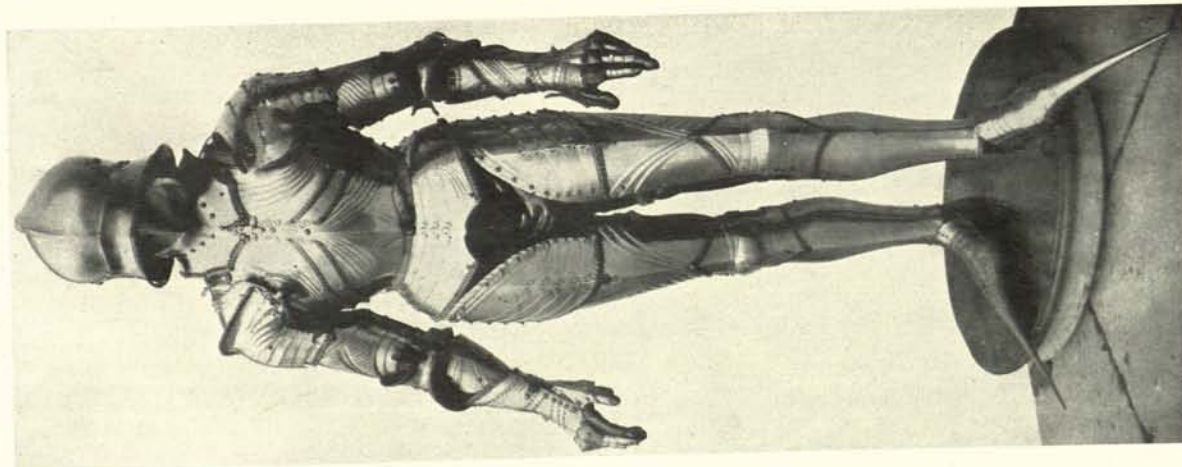


Fig. 2. Armour of Sigmund der Münzreicher, Archduke of Tyrol, c. 1470. Waffensammlung, Vienna

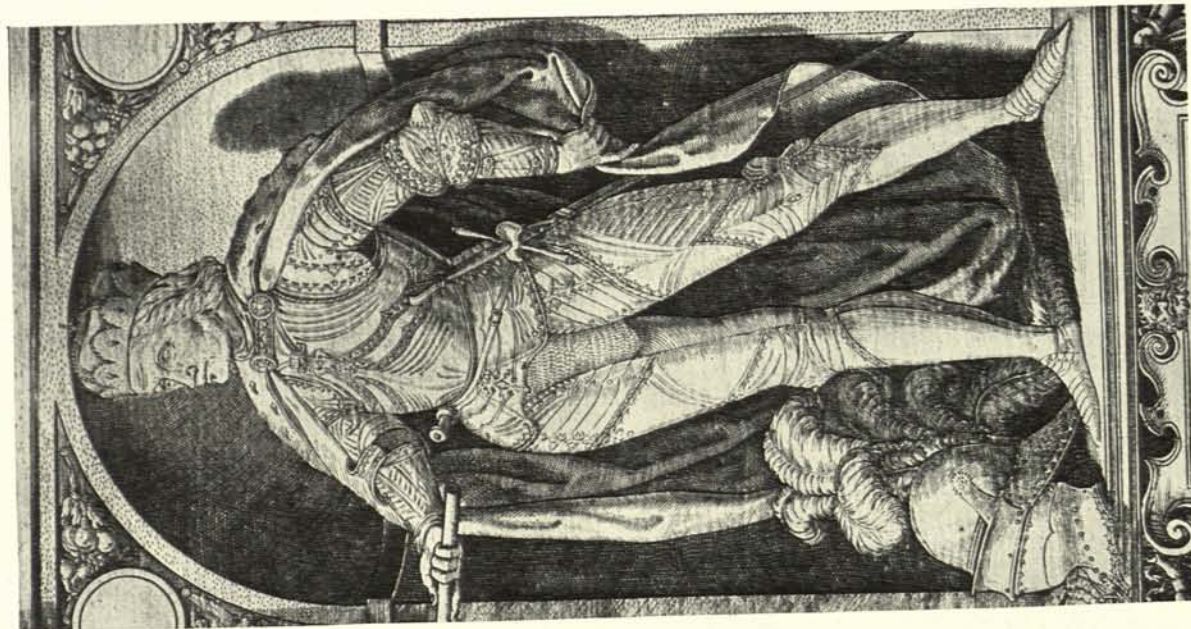


Fig. 3. Sigmund der Münzreicher, Archduke of Tyrol, engraving by Dominik Custodis, after the drawing of J. B. Fontana (1596). J. Schrenk von Notzing's *Armamentarium*, 1601

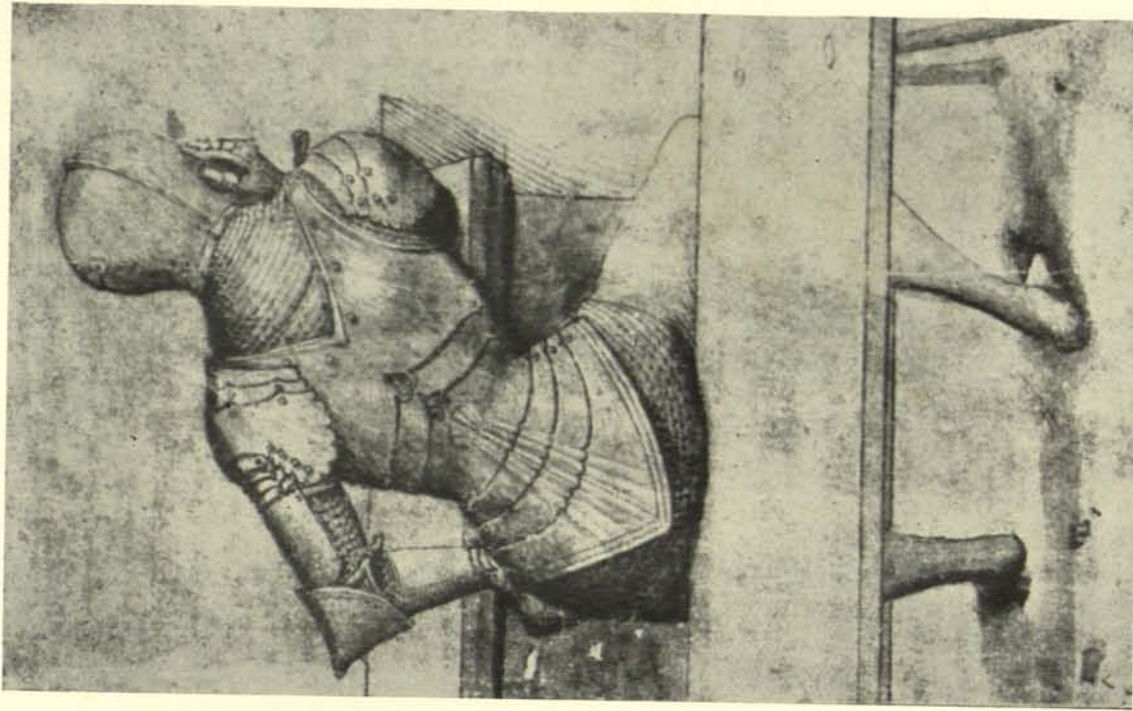


Fig. 2. Drawing of a seated soldier, c. 1490. Formerly ascribed to Hans Holbein the Elder, more recently to an unknown Tyrolean artist. Albertina, Vienna



Fig. 1. Detail, from a painting on panel, of the Road to Calvary, German School, c. 1490. Carrand Collection, Bargello, Florence

elements of the arms are connected by leathers. The large right couter has been repaired, and possibly altered in the process, but the fine left one is intact. In Italy large couters were usually built to envelop smaller ones which were articulated with the rerebraces and vambraces by free rivets in the usual way. The long elegant cuisses and the flexible, pleated back are typical examples of South German craftsmanship (pl. xxiii).

The sallet of the mounted Gothic armour in the Musée de l'Armée bears the Landshut mark, and the breastplate that of Augsburg. The Landshut mark again appears on the pauldron of the plain Gothic armour (no. 74) in the same collection, both of which Laking again tentatively described as French. The breast of this last, with its vertical sliding rivet in the centre, is of the same type as one from the arsenal at Bernau now in the Zeughaus at Berlin.¹

Several museums on both sides of the Atlantic boast German Gothic harnesses, more or less composite, and there are many breasts and backs and other separate parts worthy of close study. But for homogeneity and soundness of pedigree, there is none that can surpass the Gothic armours of the two tournament-loving Archdukes of Tyrol, Sigismund and his successor Maximilian (later emperor) at Vienna. All four date from the last quarter of the century. Neither of Sigismund's possesses a mark. Those of Maximilian bear the Nürnberg² and Augsburg marks respectively, and the latter also the helmet mark ascribed to Lorenz Colman, named *Helmschmied*.³ Maximilian's Nürnberg suit shows elaborate spiral flutes, and the second of Sigismund exhibits the rippling of the surface and the embellishment of the borders by pierced edgings of brass carried to a point beyond which it would lapse into artistic decadence. Its elaboration is perhaps more clearly shown in the engraving in Schrenk's book published in 1601 than in a photograph (pl. xxvi, figs. 2 and 3). This heavily rippled surface can be seen represented in a painting of the Crucifixion by Jan Pollak of 1492 in the Bayerisches Nationalmuseum, and in a small panel of the Road to Calvary in the Carrand Collection at Florence (pl. xxvii, fig. 1). The pair of gauntlets by Caspar Riederer at Churburg (no. 49) with their slender flutings and brass enrichments belong to this epoch, but the pair at Madrid (E. 88-9), which might at first sight be thought to be contemporary, are in point of fact of somewhat later make. Their etched decoration is of a Renaissance character with a granular ground that places them within the sixteenth century.

Vienna which bears the same mark '*Inocens*' as the chanfron no. 67 in the Churburg Armoury. Complete Gothic bardes are of the greatest rarity.

¹ A. Closs, *Z.H.W.K.*, xi, 97.

² Böheim has ascribed it, but on no definite evidence, to Hans Grünewalt, c. 1440-1503.

³ Cf. C. Buttin, *Les Bardes articulées au temps de Maximilien I^{er}*, 1929, pp. 41-7.

There is no room here to discuss the jousting armours of the Nürnberg smiths, Wilhelm von Worms and Valentin Siebenbürger at Nürnberg, and the great series at Vienna which bridge the fifteenth and the sixteenth centuries. But before closing this review of the armour worn in Germany in the fifteenth century it may be noted that the skill and activity of the South German platers did not prevent Milanese armours from crossing the Alps.

There is the well-known Missaglia armour of Friedrich der Siegreiche, Count Palatine of the Rhine, at Vienna, who earned his name by his victories against the Imperial troops at the bloody battles of Sickingen and Gingen in 1462. There is also a remarkable fifteenth-century Milanese armour, homogeneous in all its parts, and bearing a most interesting series of marks, which has escaped the attention of students of armour in its resting-place on a bracket in the church of the Holy Cross at Schwäbisch-Gmünd (figs. 7 and 8 and pl. xxviii, fig. 3). It was worn in the war of Schmalkalden in 1525 by a citizen of the town, Johann Rauchbein, who later presented it to the church,¹ but the date of its making is considerably earlier. The long sallet and bevor are in the German style. The bevor has a curious patch with serrated edge riveted to it in front. The borders of the arm-pits of breast and back are turned over in a series of knullings, and the edges of the plates composing them are accompanied by a flowing pattern of punched dots (fig. 8), the forerunner of etched ornament on armour. It is also found on a Gothic backplate in the collection of M. Pauilhac in Paris. There is a pointed and fluted rump-plate suspended from the culet of three lames behind, and the tassets are of attractive form. The pauldrons are of the usual ample Milanese build, with reinforcing plates in front and applied strips to the back. The elbows are unsymmetrical, that on the right being smaller with the characteristic reinforcement of the upper part of the wing. There are 'stops' or *lisières d'arrêt* upon the vambraces. The cuisses are articulated in the upper part by sliding rivets, with boxed side-plates attached by hinges. The greaves terminate in sabatons, which are commoner in Germany than in Italy and may be a concession to German taste.

In April 1457 Ludwig Duke of Bavaria sent his armourer, Wilhelm Hochenberger of Landshut, to buy armour in Milan,² and on the 24th July 1460 the Duke of Milan issued a permit to Johann Stadler of Ulm to convey armour from Milan which Conrad Winsternach had ordered to be sent to his father Count Winsternach, chamberlain of the Emperor, at Ulm, viz.: '*toracem unum, par unum arnesiorum, corselium unum, par unum spallaciorum, par unum bra-*

¹ A. Nägele, *Die Heilig-Kreuzkirche in Schwäbisch-Gmünd*, 1925. It is interesting to note that, at the laying of the foundation-stone of the Cathedral of Ulm, Heinrich Schreiber, armourer, contributed an armour which was sold for the building fund for six florins.

² E. Motta, *Archivio Storico Lombardo*, 1914, p. 207 et seqq.

cialium, par unum guantiorum, item celatam unam a visiera, barbetum unum, testeriam uni equi. In 1473 the governor of the Castle of Milan wrote to the duke that there was a German from Basel who had bought much armour of

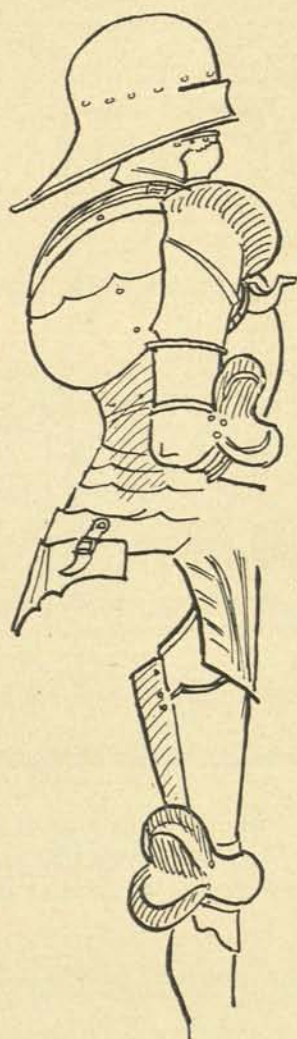


Fig. 7. Milanese armour in the church of the Holy Cross, Schwäbisch-Gmünd.

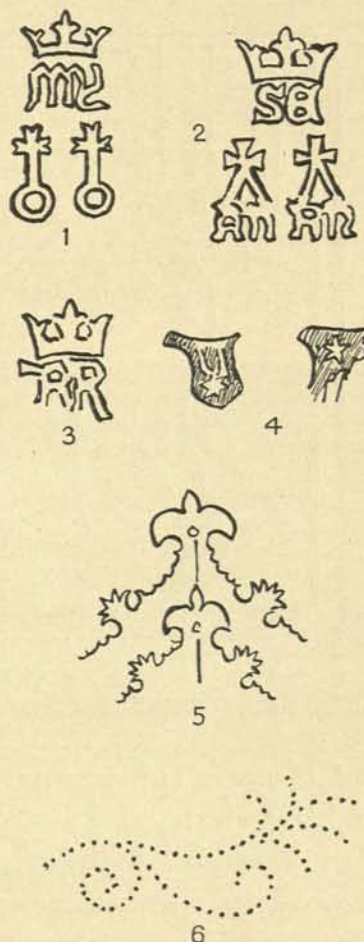


Fig. 8. Marks: (1) reinforce of left pauldron; (2) skirt, left tasset and backplate; (3) reinforce of left elbow; (4) both knee-cops; (5) cusped borders of articulation of breast; (6) ornament of punched dots on breast, of the Schwäbisch-Gmünd armour.

the German fashion (*facte a la todescha*) which he had had packed up and dispatched. In September 1480 the Duke of Milan allowed Cristoforo de Capelli and Antonio degli Armaroli to leave their shops and engage in the production of arms in the German style (*more theutonico fabricata*), at their own expense in the house or workshop of Thomas de Tanciis (? Danzig), a German.¹ From which one gathers that coals could be carried to Newcastle.

¹ Motta, *op. cit.*, pp. 218-19.

Further evidence of the wearing of Italian armour in Germany can be found occasionally represented in painting and sculpture, as, for instance, in the series of panels by the Master of the Lyversberger Passion in the Wallraf-Richartz



Fig. 9. German armorer and his apprentice at work. Woodcut illustration to Rodericus Zamoriensis, *Spiegel des menschlichen Lebens*, Augsburg, 1479.

Museum at Cologne (pl. xxviii, fig. 1), and in a painting of St. George and the Dragon by Friedrich Herlin in the town museum at Nördlingen.¹ The glass panel of William, Markgraf von Baden, †1473, reproduced by Hefner-Alteneck,² seems to show a Milanese harness with its small subsidiary tassets and high placate, and so perhaps does the effigy of Ulrich von Hohenrechberg, †1458, at Donzdorf (pl. xxviii, fig. 2), especially in the build of the pauldrons. The Swabian artist Hans Multscher, who has already been referred to for his representations of German fluted and deep-skirted armours, in his later years used an Italian model for the armour on his figures of St. George and St. Florian at Sterzing (Vipiteno);³ on the other side there is evidence of Italians preferring the German style. In a letter dated 13th May 1493 Francesco, Marquess of Mantua, wrote asking for *quattro o sei pecti a la Thodesca de diverse sorti più preste che sia possibile*,⁴ and in 1507 he began his connexion with *Maestro Colmo smit tedesco* (Lorenz Colman 'Helmschmied' of Augsburg).

¹ Heidrich, *Alt-Deutsche Malerei*, p. 44.

² *Op. cit.*, v, pl. 296.

³ *Archaeologia*, lxxx, pl. xxx.

⁴ Bertolotti, *Archivio Storico Lombardo*, xv, 1888, 125.

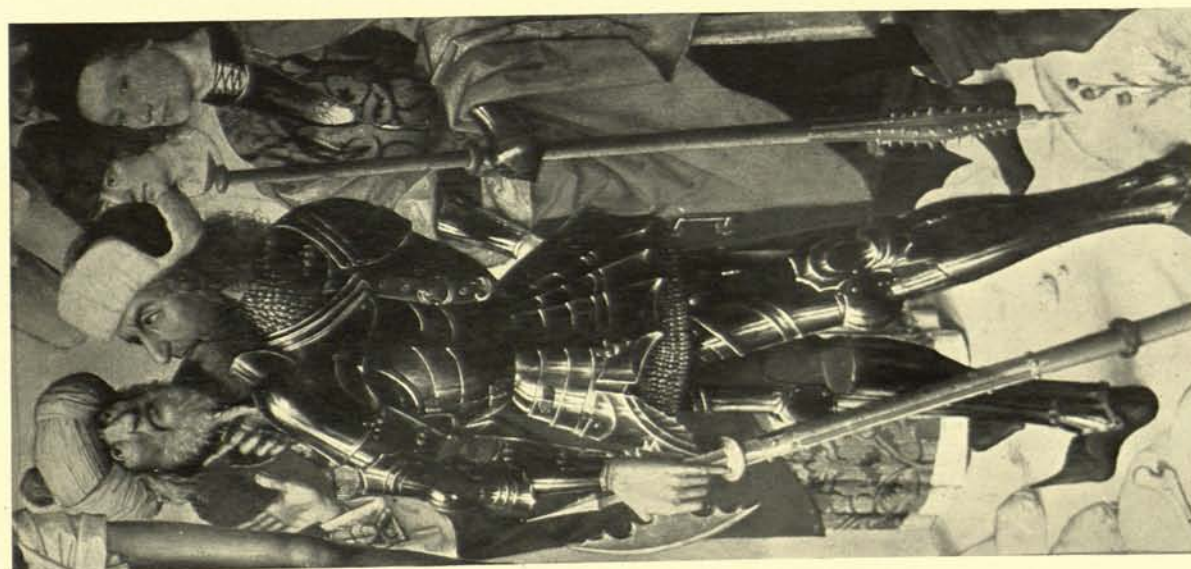


Photo. Bildarchiv, Köln

1

Fig. 1. Detail of the Crucifixion, painting by the Master of the Lyversberger Passion. Wallraff-Richartz Museum, Cologne
 Fig. 2. Effigy of Ulrich von Hohenrechberg, †1458, Donzdorf, Württemberg. From a cast in the Germanisches Museum, Nürnberg
 Fig. 3. Armour with Milanese marks, c. 1480. In the Church of the Holy Cross at Schwäbisch-Gmünd

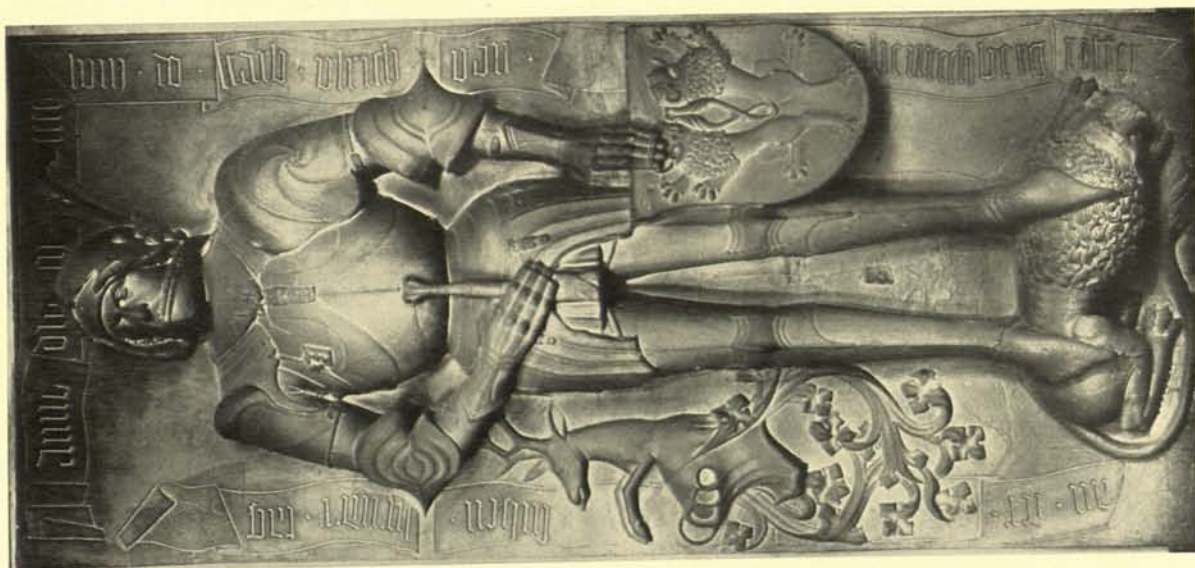
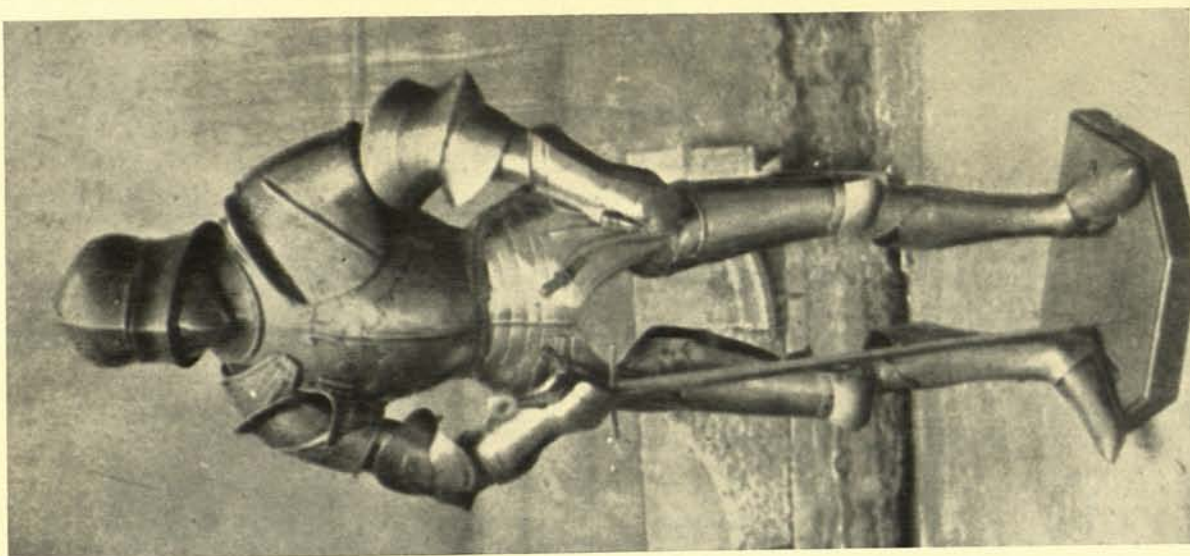


Photo. Christof Müller

2



After Nägele

3

As I have pointed out in an earlier study,¹ it was the coalescing of Italian and German styles which produced the round and fluted armours of the 'Maximilian' fashion at the end of his reign. The Gothic form in Germany had reached its ultimate development, and under the influence of the Renaissance it gave way quite suddenly to a burlier and less romantic fashion, but more in keeping, one imagines, with the physique of its wearers. Though a few conservatives continued for a time true to the older style, its end really came with the turn of the century and in the international conflict of the Italian wars.

The sixteenth century looms large in the mind of the museum curator and the collector, for it has provided most of their material, including much fine craftsmanship and plentiful documentary evidence. But for the historian, the *archéologue-ès-armes*, as the late M. Buttin used to call him, the two preceding centuries have a special place, for they were the last during which armour was worn without question on active service by all who could afford it. During these few years, the penultimate stage in the age-long contest between the weapons of attack and defence, the complete and homogeneous harness of articulated steel was evolved, and by rapid stages perfected. There are many branches of the arts in which the productions of the Near and Far East can be ranged alongside those of the West, but in this field of human ingenuity and skill Europe can claim to stand alone.

¹ *Archaeologia*, lxxix, 219.

APPENDIX I

The following is a list of armour of German origin or use dating from the fourteenth century, in addition to the examples mentioned by Laking, *op. cit.* I, chaps. iii-v, viii, ix.

*Bascinet*s: (a) *egg-shaped*: Nürnberg Germ. Mus. (fig. 2); Berlin, Zeughaus (three, *Z.H.W.K.*, xii, 245; Zürich, Landesmuseum (from Attinghausen, destroyed 1356; *ibid.*, vi, 193-5); one found at Schloss Braunsfels (now in this country); (b) *ogival and others*: Tannenberg and Bierbach finds, Darmstadt; Basel (visor modern); that at Thorn is perhaps too oriental to be included here (*Z.H.W.K.*, vii, 109); (c) *international type*: Nürnberg Germ. Mus. (fig. 4); Sion, Musée Valère (has had a peak added to convert it to burgonet); Berlin, Zeughaus (*op. cit.*); New York, Metropolitan Museum; London, H. D. Barnes Coll. (at one time in the family of the Grafen Auersperg), Fischer Sale, Luzern, 1935 (ex-Crown Prince Ruprecht). Laking referred to, but was unable to describe, the four at Churburg, one of which is now in U.S.A.

Visors alone: (a) *Klappvisiers*: Marburg Museum (*supra*, fig. 3); Munich, Armee-museum; Berlin, Zeughaus; (b) *pig-face*: Copenhagen Museum; Bern, Hist. Museum; Berlin, Zeughaus; *aventails*: Churburg (3); Berlin, Zeughaus; Dean Collection, New York, no. 24.

Helms: Kornburg helm, Nürnberg; Küssnach (Gessler, *op. cit.*), now at Zürich; Ärnäs, now in Stockholm Museum; Stein, in Carniola, now at Kreuzenstein, *Z.H.W.K.*, ix, 122. The one mentioned by Laking at Copenhagen is false.

Body-armour. The finds at Tannenberg, Küssnach, and especially Wisby, have all contributed fragments, cf. Thordeman, *Acta Archaeologica*, iv, 1933, *Z.H.W.K.*, xi, 129, xii, 201, and a few pieces from Alt-Tischein, R. Prihoda, *Z.H.W.K.*, xi, 225. Some hauberks, like that of Leopold III, †1386, at Lucerne, may descend from the fourteenth century, but are not easy to date.

Gauntlets: Churburg (pair); Dresden, Hist. Mus.; Nürnberg, Germ. Mus. (fig. 5); Stockholm (from Alsnö); Wisby; Boringholm; and Küssnach, see Nørlund & Thordeman, *Acta Archaeologica*, ii, 1931.

Shields: Laking described two of those at Marburg, but there are nine more. Some of the surviving shields of the bouched type may date from this century. These have mostly survived as *Totenschilder* (hatchments), and it is doubtful if they were not in many cases made for funerary purposes rather than active service. Several of the pavises existing in various museums and city halls may, like those of the Teutonic Order (*Z.H.W.K.*, ii, 94) and from Erfurt (Berlin, New York), go back to the fourteenth century.

Outside of Germany, the most important homogeneous survival of a late fourteenth-century armour is that in the Musée municipale at Chartres, which has not yet received the attention that it deserves.

APPENDIX II

The following is a brief representative list of military effigies in Germany and Austria. It is followed by a select bibliography, to which references are made in abbreviated form.

I. PREDOMINANTLY MAIL

- Diether III v. Katzenelnbogen, †1276 [1299], Biebrich *Hefner* 132, *Fischel* 27.
 Bolko I v. Schlesien, †1301, Grüssau *Weigert* lxxxvii.
 Otto v. Lossow, †1313, Radmeritz *Z.H.W.K.* xii, 66.
 Rudolf v. Thierstein, †1318, Basel *Weigert* lxxxix, *Futterer* 72, *Hefner* 159.
 Heinrich Otto v. Hessen, †1308, [c. 1320], Marburg *supra* pl. xiv, fig. 1, *Hamann* 156, *Weigert* lxxxvii, *Karpa* 45.
 Johann v. Hessen, †1311, [c. 1320], Marburg *Hamann* 205, *Karpa* 45.
 Gottfried and Otto v. Kappenberg, [c. 1320], Kappenberg *Hamann* 195, *Pinder* (xiv c.) 24.
 Albrecht v. Hohenlohe, †1319, [? c. 1340], Schöntal-an-der-Jagst *Hefner* 160.
 Otto III v. Ravensberg, [†1320], Bielefeld *Hamann* 237.
 Johann v. Tüdingen, †1325, Freiburg Museum *Karpa* 46, *Hamann* 257, 258.
 Gottfried v. Bergheim, †1335, Münstereifel *Baum* 112.
 Rudolf v. Hohenberg, †1336, Rottenberg-Ehingen *Baum* 114.
 Albrecht v. Hohenlohe-Möckmühl, †1338, Schöntal *Weigert* lxxxviii, *Baum* 115.
 Ulrich v. Ahelvingen, †1339, Ellwangen *Weigert* lxxxviii.
 Bolko II v. Schlesien 1341, Heinrichsau *Wagner* vi, 7.
 Anon., [c. 1340], Freiburg-im-Breisgau *Buttin*, *op. cit.*, 45.
 Anon., [c. 1340], Husz, Colmar Museum *Buttin* 39.
 Anon., [c. 1340], Rouffach *Gerlach* 32.
 Gottfried v. Fürstenberg, †1341, Haslach *Buttin*, *passim*.
 Ulrich v. Werdt, †1344, Strassburg *K.D.B.*
 Heinrich v. Seinsheim, †1345, Mariaburghausen *Wagner* iv, 2, *Buttin* 38.
 Berthold v. Waldner, †1343, Soultz *Heideloff* ix, 2.
 Louis Landgraf v. Thüringen und Hessen, [c. 1350], Rheinhardtbrunnen *K. D. Rhein.*
 Adolf VIII v. Berg, †1348, Altenberg *K.D.B.*
 Ernst v. Eck, [c. 1340-50], Erding *Fischel* 29.
 Heinrich Beyer v. Boppard, †1355, Boppard (now Berlin K.F.M.) *Hefner* 184.
 Ulrich Landschade, †1369, Neckarsteinach
 A. Hirschhorn, [c. 1360], Ersheim

II. MIXED ARMOUR

- Otto v. Orlamünde, c. 1340, Orlamünde *Z.H.W.K.* x, 212, *Hefner* 175.
 Günther XXI v. Schwarzburg, †1349, Frankfurt Cath. *Hefner* 172, *Weigert* lxxxix, etc.
 Walter v. Bopfingen, †1359, Bopfingen *Z.H.W.K.* x, 212, *Baum* 117, *Hefner* 180.

- Gerhard I v. Berg, †1360, Altenberg *K. D. Rhein.*
 Ludwig v. Oettingen, [c. 1360], Kirchheim *Wagner iv, 2.*
 Peter Creglinger, †1365, Rothenburg o/T. *Hefner 188.*
 Johann v. Falkenstein, †1365, Arnsburg *Fischel 30, supra, pl. xiv, fig. 3.*
 Theodorich v. Lichtenhayn, †1366, Erfurt *Buchner 5, Kunze xvii.*
 Heinrich v. Cronberg, †1367, Cronberg *Wagner iv, 2.*
 Günther XXV v. Schwarzburg, †1368, Arnstadt *Kunze xxv, supra, pl. xvi, fig. 3.*
 Hans v. Ybbs, †1368, Ibbs *Lind xiii.*
 Conrad v. Seinsheim, †1369, Schweinfurt *Hefner 190.*
 Rudolf v. Sachsenhausen, †1371, Frankfurt Cath. *Fischel 33, 38, Hefner 193, Wagner i, 5.*
 Gottfried v. Arensburg, †1370, Cologne Cath. *Lüthgen 33, Hefner 195, Wagner iv, 2.*
 Baltasar v. Gröland, †1371, Nürnberg *Drost 19.*
 Otto v. Pienzenau, †1371, Ebersberg
 Johann v. Katzenelnbogen, †1357, [c. 1370], Biebrich *Fischel 32.*
 Hartmann v. Kroneberg, †1372, Cronberg i/Taunus *Hefner 198.*
 Hüglin v. Schöneck, †1374, Basel Cath. *Hefner 204.*
 Ulrich Landgraf v. Elsass, †1374, Strassburg *Heideloff ix. 2.*
 Theodorich v. Witzleben, †1376, Arnstadt *Gerlach 37, Kunze xvii.*
 Hennel Thüringer Landschaden, †1377, Neckarsteinach *Hefner 205.*
 Beringer v. Berlichingen, †1377, Schöntal *Baum 118.*
 Weikhard Frosch, †1378, Frankfurt St. Catherine's *Hefner 208, Wagner i, 5.*
 Gottfried v. Ivra (?), †1379, Neustadt *K.D.B., Pinder (P.W.) xlv.*
 Burkhard v. Steinberg, †1379, Hildesheim *Gerlach 20.*
 Premysla Otakara II, [c. 1380], Prague *Podlaha 225, Styx.*
 Bretislava I, [c. 1380], Prague *Podlaha 224.*
 Bretislava II, [c. 1380], Prague *Podlaha 222.*
 Dieter v. Hohenberg, †1381, Hohenberg a/M. (now Munich) *supra, pl. xvi, fig. 1.*
 Bernhard v. Masmünster, †1383, Basel Cath. *Hefner 204.*
 Gebhard v. Querfurt, †1383, Querfurt *Pinder (xiv c.) 85, (D.P.) 72.*
 Huglin v. Schönegg, †1386, Basel, St. Leon *Futterer 73.*
 Walther v. Hohenklingen, †1386, Feldbach
 Heinrich v. Erbach, †1387, Michelstadt *Hefner 210.*
 Conrad v. Bickenbach, †1393, Röllfeld (now Munich) *Hefner 220, Pinder (P.W.) xlv.*
 Johann Kümersprucker, †1393, Rattenberg *Leonhardt 8.*
 Johann v. Linden, †1394, Arnsburg *Hefner 222.*
 Reinhard v. Wehingen, †1394, Klosterneuburg *Lind xi.*
 Pfalzgraf Rupert Pipan, †1397, Amberg *Halm K.K. xvii. 17 & K.D.B.*
 Pfalzgraf Aribio, [c. 1395-1400], Seeon *Halm K.K. xvi, 424, 425, xvii, 16.*
 Albrecht II v. Bayern, †1397, Straubing *Halm K.K. xvii, 15, Pinder (D.P.) 157.*
 Ulrich v. Schaunburg, †1398, Wilhering *Lind xviii.*

III. EARLY FIFTEENTH CENTURY

- Anon., c. 1400, Wimpfen, Dominikanerkirche.
 A. v. Hirschhorn, c. 1400, Ersheim
 Knebel v. Katzenelnbogen, †1401, Oppenheim *Hefner 226.*
 Heinrich v. Bickenbach, †1403, Hohenburg *Pinder (P.W.) xlv.*
 Johann Graf v. Wertheim, †1407, two effigies differently armed in
 same church, Wertheim *Hefner 229, 231.*
 Oswald v. Wolkenstein, 1408, Brixen *Hefner 237, Lind xxix.*
 Ludwig v. Rieneck, †1408, Lohr *K.D.B., Pinder (P.W.) xlvii.*
 Albert v. Kirchberg, [c. 1410-20], Kappellendorf *Buchner 8.*
 Anon., c. 1410-30, Mainz Cath. *Hefner 242.*
 Ludwig von Hutten, †1414, Himmelspforten *Hefner 240, Pinder (P.W.) xlv.*
 Dietrich Steinberger, †1414, Oberaltaich *Halm K.K. xvii, 10.*
 Johann v. Dalberg, †1415, Oppenheim *Börger 12.*
 Dietrich Hofer, †1416, Sünching *Halm K.K. xvii, 11, 12.*
 Conrad v. Kirchberg, †1417, Wiblingen *Baum 122.*
 Friedrich and Asmin v. Bozen, [1418], Oberaltaich *Halm K.K. xvii, 9.*
 Hadmar IV v. Laaber, †1420 *K.D.B.*
 Moritz v. Oldenburg, †1420 *supra, pl. xvii, fig. 2, K.D.B.*
 Heinrich v. Ortenburg, c. 1420, Passau *Halm K.K. xvii, 27.*
 Kunz v. Haberkorn, †1421, Würzburg, now Munich *Hefner 242, Pinder (P.W.) xlviii.*
 Conrad Schenck v. Erbach, 14?? *Erbach Sale, 1932, 64 (miscalled 65 in plate).*
 Duke Ernst the Iron, †1424, Reun *Lind xxxii.*
 Andreas Hörleinsperger, †1427, Efferding *Lind xxxix.*
 Philip v. Ingelheim, †1431, Oberingelheim *Hefner 247.*
 Thomas v. Rieneck, †1431, [? c. 1410] *K.D.B.*
 Heinrich zum Junger, †1433, Oppenheim *K.D.B.*
 Martin v. Seinsheim, †1434, Würzburg *Hefner 249, Pinder (P.W.) xlviii.*
 Georg v. Fraunberg, †1436, Gars *Halm K.K. xvi, 445.*
 Conrad v. Königsberg, †1448, Sebenstein *Lind xxi.*
 Franz v. Hohenberg, †1458, Lilienfeld *Lind xxxiv.*

IV. DEEP-SKIRTED AND EARLY FLUTED WHITE HARNESS

- Berthold Truchsess v. Emmenberg, †1403, [? c. 1440], Fehring *Lind xxiii.*
 Gottfried v. Eppstein, †1437, Eppstein im Taunus *Hefner 253.*
 Ulrich v. Teck, †1432, Mindelheim *Baum 123, Pinder (D.P.) 175.*
 Friedrich v. Pettau, †1438, Ober-Pettau *Lind xxiv.*
 A. von Nordenburg, [c. 1440], Rothenburg St. F.
 Anon. [c. 1440], Bielefeld *Kelly, op. cit.*
 Peter I v. Stettenberg, †1428, [? c. 1440], Brombach *supra, pl. xix, fig. 1.*
 Peter II v. Stettenberg, †1441, Brombach *Hefner 255.*
 Georg v. Seckendorf, †1444, Heilbronn *Hefner 257.*

- Conrad v. Weinsberg, †1446, Schöntal a.d./J. *Baum* 124, *Hefner* 259, *Arch.* lxxix.
 Matheus v. Granns, †1449, from Raitenhaslach (now Burghausen Museum) *Leonhardt* 27.
 Wilhelm v. Aichberg, †1452, Isarhofen *Halm K.K.* xvii, 37.
 Martin v. Wildenstein, †1466, Gnadenburg *K.D.B.*
 Christof v. Parsberg, †1469, Parsberg *Pinder (D.P.)* 249.

V. GOTHIC ARMOUR

- A. Hutten, †1447, [? later] *K.D.B.*
 Johann v. Schlunitz, †1456 *Drost* 23.
 Conrad Schenck v. Erbach, †1454 (*Erbach Sale* 1932).
 Ulrich Birch, †1458, Bayr. Nat. Mus.
 Ulrich v. Hohenrechberg, †1458, Donzdorf *supra*, pl. xviii, 2.
 Heinrich Petersheim, †1460, Obernberg *Lind*, pl. xliv.
 Sigmund von Lentersheim, †1460, Ansbach *supra*, pl. xx, 3.
 Anon., c. 1460, Paulinzella
 Melchior v. Hirschhorn, †1461, Hirschhorn
 Otto I v. Mosbach, †1461, Reichenbach *K.D.B.*
 Ulrich Sack, †1461, Erfurt *Buchner* 16.
 Leopold v. Leuchtenberg, †1463, Pfriemd *K.D.B.*
 Anon., ? c. 1460, Rothenburg, St. John's
 Georg v. Ehenheim, †1464, [? later], Ansbach
 Oswald v. Säben, †1465, Neustift *Lind*, xxxvii.
 Hermann VII v. Henneberg, †1465, Römhild *K.D. Thüringen.*
 Georg I v. Henneberg, †1465, Römhild *K.D. Thüringen.*
 Jörg Truchsess v. Waldburg, †1467, Waldsee *supra*, pl. xxii, 2, *Pinder* (xv c.), 47, 48.
 Wilhelm v. Ingelheim, †1465, [? 1483], Oberingelheim *Hefner* 280, *Wagner* i, 6.
 Ulrich v. Helfenstein, †1467, Blaubeuren
 Georg III S. Georg, †1467, St. Georg (Hungary) *Lind*, xxviii.
 Otto Schenk v. Erbach, †1468, Michelstadt
 Johann v. Abensperg, †1469, Abensberg *K.D.B.*
 Albrecht v. Waldstein, †1470, Römhild *K.D. Thüringen.*
 Peter Truchtlachinger, †1415 [c. 1460], Truchtlaching *Halm K.K.* xvi, 444-5.
 Baltasar v. Welsberg, †1470, [? earlier], Taisten
 Drawing for an effigy at Dresden, c. 1470 *Hefner* 281.
 Heinrich v. Nothaft, †1471, Straubing *Halm K.K.* xvii, 44.
 Haimeran v. Muggenthaler, †1471, Schamhaupten *K.D.B.*
 Ludwig I v. Hessen, †1458, [1471], Marburg *supra*, pl. xx, 2.
 Ulrich Staufer zu Ernfels, †1472, Sünching *K.D.B.*, *Halm K.K.* xvii, 45.
 Johann Truchsess v. Wetzhausen, †1476, Wetzhausen *K.D.B.*
 Johann v. Staufer zu Ehrenfels, †1478, Beratzenhausen *K.D.B.*
 Hans v. Rothenstein, Grumbach *K.D.B.*
 Ludwig II v. Hessen, †1471, [1478], Marburg
 Heinrich III v. Hessen, †1484, Marburg
 Christoph Sigwein, †1478, Hall, Tyrol

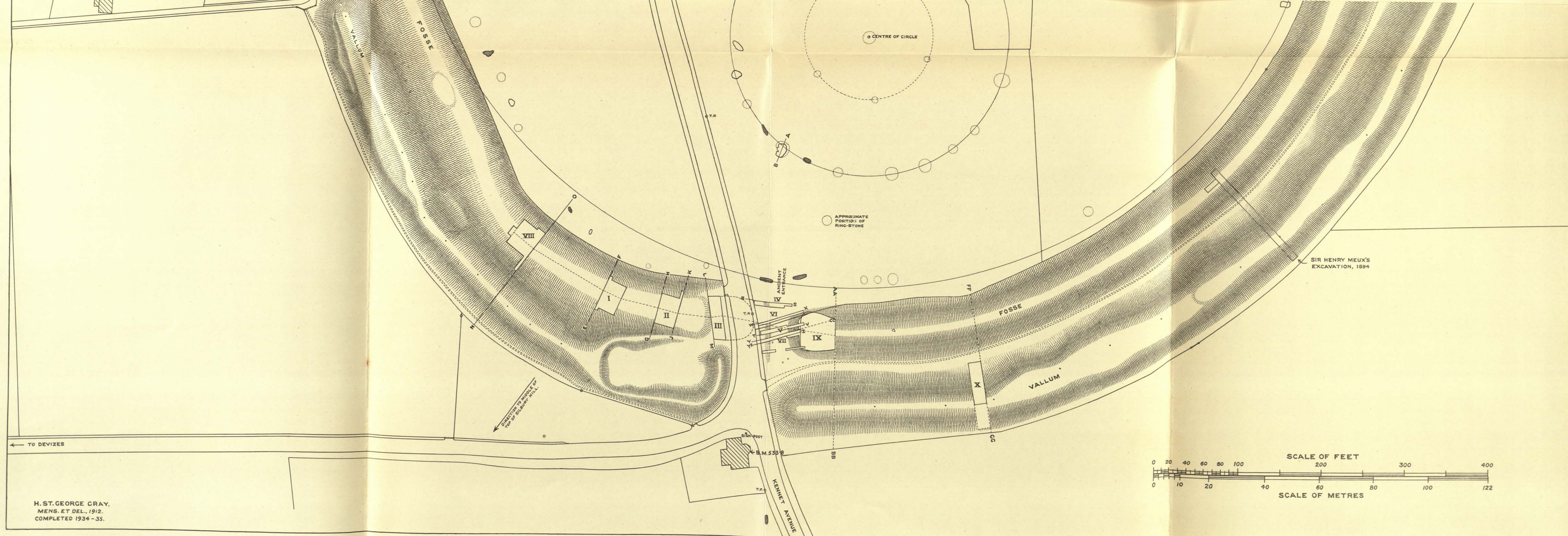
- Wilhelm v. Henneberg, †1479, Bozen
 Otto VIII v. Henneberg, †1502, [c. 1480], Römhild
 Lorenz v. Eberstein, †1480, Ansbach
 A. Truchsess v. Wetzhausen, c. 1480, Wetzhausen
 Hans Schenk v. Erbach, †1486, [1481], Michelstadt
 Georg Schenk v. Erbach, †1481, Michelstadt
 Georg v. Ebenheim, †1468, [c. 1480], Ansbach
 Dytz Truchsess v. Wetzhausen, †1481
 Hans v. Ingelheim, †1483, Oberingelheim
 Conrad v. Hutten, †1483, Arnstein
 Wilhelm v. Ellrichshausen, †1483, Heilbronn
 Georg Sack, †1483, Nürnberg, Germ. Museum
 Dietrich v. Berlichingen, †1484, Rothenburg
 Otto Schenk v. Erbach, †1484, Michelstadt
 Baltasar v. Wiesbriach, †1484, Villach
 Diether v. Handschuchheim, †1484, Handschuhheim
 Anon., †1485, Rott
 Eberhart v. Grumbach, †1487, Rimpf
 Emmerich Szapolyai, †1487, Szepeshily, Hungary
 Friedrich II v. Henneberg, †1488, Römhild
 Hans v. Cronberg, †1488, Cronberg im Taunus
 Ludwig and Hans Paulsdorfer, †1490, Munich, Bayr. Nat. Mus.
 Bernard Gradner, †1489, Eglisau (Switz.)
 Walter zu Wildthurn, [c. 1490], Reichersdorf
 Conrad v. Ehenheim, †1490, Ansbach
 A. Graf v. Lupfen, [c. 1490], Engen
 Jörg von Tegernbach, †1493, Würzburg, Franziskanerk.
 Tomas Tarczay, †1493, Héthaz (Hungary)
 Blicher Landschaden, †1493, Neckarsteinach
 Johann v. Eschbach, †1496, Lorch
 Carl v. Eberstein, †1497, Ansbach
 Gilius Valck, †1497, Wilten
 Pfalzgraf Otto, †1499, Neumarkt
 Conrad v. Schaumburg, †1499, Würzburg
 Pfalzgraf v. Görz, †1500, Görz (Gorizia)
 A. Fröschl, [c. 1500], Marzoll
 Friedrich v. Seinsheim, †1500, Marktbreit
 Hans v. Schaumburg, †1501, Hassfurt
 Carl v. Luchow, †1501, Ansbach
 Hans v. Haldermanstetten, †1502, Ansbach
 Philip Voit v. Rieneck, †1504
- Lind* xlii.
K.D. Thüringen, Laking 205.
Bruhns i, 3.
Hefner 358.
Gerlach 4 (2), *Hefner* 358.
K.D.B., Bruhns i, 1.
Wagner i, 6, *Hefner* 372.
K.D.B.
Hefner ...
supra, pl. xxv, 2, xii, 2.
K.D.B.
K.D.B.
K.D.B., Bruhns i, 2.
Szendrei 433.
K.D. Thüringen.
Hefner 383.
Wagner i, 6.
Gröber 46.
Christl. Kunst. xi, 1914/15, 182.
Szendrei 105.
Hefner 429.
supra, pl. xxi, 1, *Wagner* i, 6.
Lind xxvi.
K.D.B.
Hefner 430, *Arch.* lxxix, pl. LXVII.
Lind lxxv, 4.
K.D.B., Leonhardt 40.
Bruhns ii, 5, *K.D.B.*
K.D.B., Bruhns iii, 9.
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Bruhns i, 4.

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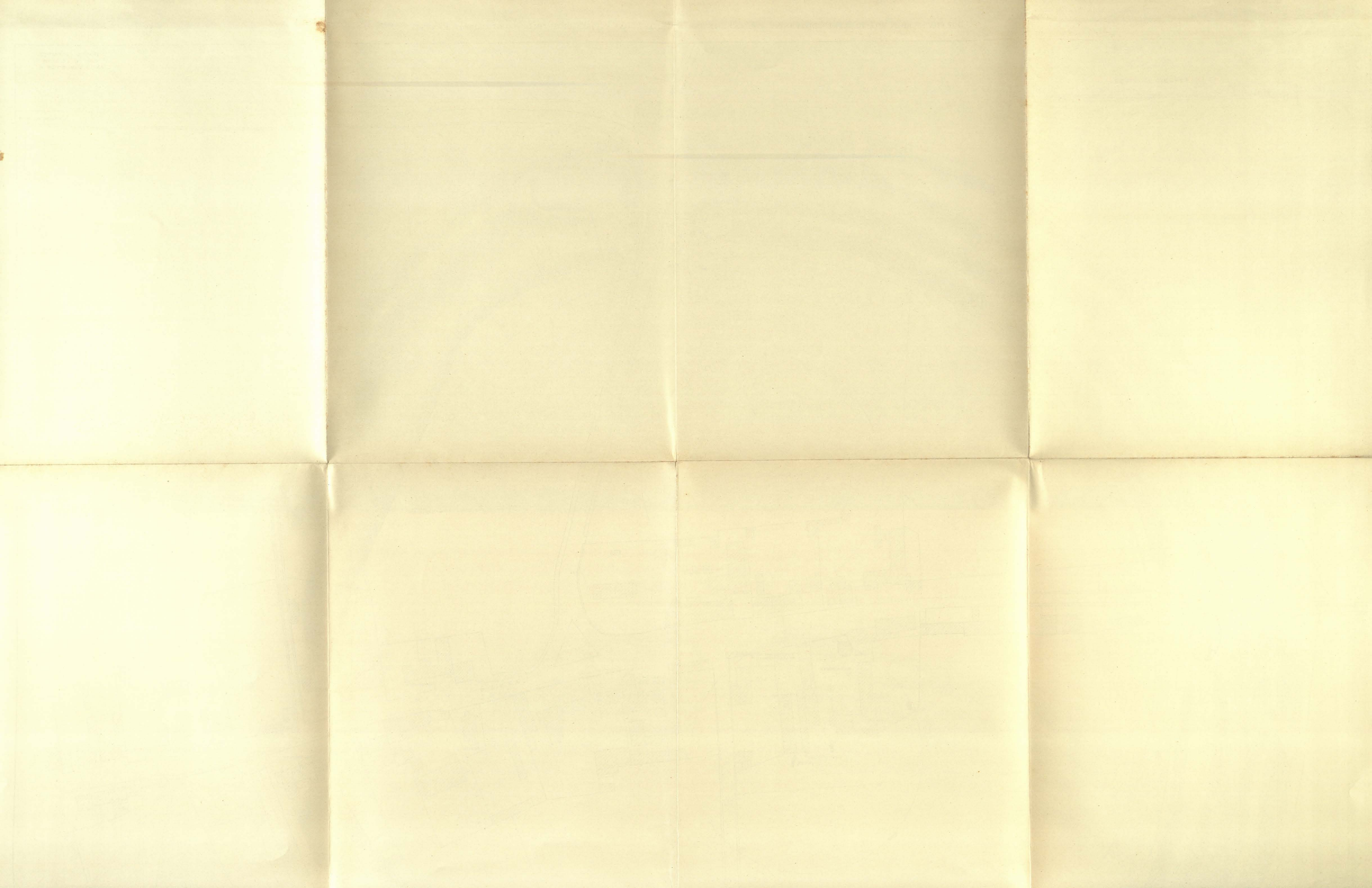
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H. ST. GEORGE GRAY,
MENS. ET DEL., 1912.
COMPLETED 1934-35.

PLAN OF AVEBURY IN 1912—THE STONE CIRCLES AND EARTHWORK, AND THE CENTRAL AND EASTERN PARTS OF THE MODERN VILLAGE



VI.—*The Avebury Excavations, 1908-1922.*

By H. ST. GEORGE GRAY, *Esq., F.S.A.*

Read 15th November 1934.

I. INTRODUCTION.

IN point of size and grandeur Avebury¹ stands out pre-eminently among the prehistoric stone monuments of Britain. It is, however, decidedly difficult to realize fully what Avebury and its appendages were when in the height of their glory. The monument has been terribly mutilated, and vandalism must have prevailed for many years, if not centuries, to effect the complete destruction of so large a number of the great monoliths.

We have been helped, however, to understand the original form of Avebury by making reference to the plans of Aubrey,² Stukeley, Hoare (drawn by Crocker), and Lukis; but modern archaeologists can accept only a certain proportion of the statements and theories advanced by these antiquaries. Much remains to be proved with regard to the precise original form and lay-out of the great Avebury monument and its avenues of approach.

Avebury, as we know it to-day, consists of an agricultural village, which, as it has grown, has unfortunately been extended into the central part of the ancient enclosure, thus causing the partial destruction of the inner group of circles. It is situated about 525 ft. above mean sea-level, and is commanded by higher ground at a short distance away.³ The sarsen stones remaining are so few that the casual observer visiting Avebury for the first time finds it most difficult clearly to understand the original lay-out of this fascinating monument. The stupendous ditch enclosing the circles is very striking, but few visitors realize that it is full of silt, and was in prehistoric times open to a great depth.

The fosse is bounded by a vallum of imposing height, of which more than three-quarters remain, many parts being well preserved. The mutilation of the rampart and ditch in places was caused chiefly by the building of the eastern half of the village, and the construction of roads which approach Avebury from four directions. Walls (see pl. xxxii, fig. 2) and houses, obviously built of the venerable stones, collected and cracked up for the purpose, meet one's gaze at

¹ *Avreberie* in Domesday.

² The stones of Avebury were first noticed by Aubrey in 1648-9, when he observed that Avebury far surpassed Stonehenge as a cathedral does a parish church.

³ The site of 'the Temple' is on the outcrop of the Middle Chalk zone of *Rhynchonella Cuvieri*.

every turn.¹ Indeed, as Lord Avebury said in *Prehistoric Times*, 'the pretty little village of Avebury, like some beautiful parasite, has grown up at the expense and in the midst of the ancient temple'.

The immediate surroundings of Avebury are equally interesting, and in dealing with any one of these ancient sites it is natural that we should be constantly weighing its archaeological value with evidences of prehistoric date from the adjoining sites; and so the study of Avebury and its appendages and neighbouring ancient sites becomes rather complicated.

Of the Kennet Avenue, which approaches Avebury from the SE., nineteen stones remained to be seen at the time of our excavations at Avebury. Stukeley, with Lord Winchelsea, counted seventy-two stones of the avenue in 1722. However, after Mr. A. Keiller's extensive excavations here (begun in 1934), we shall be very much more enlightened with regard to details in the construction of this avenue.

Continuing farther to the SE. of Avebury we come to 'The Sanctuary' on Overton Hill representing the termination of the Kennet Avenue, where excavations were carried out in 1930 by Mr. and Mrs. B. H. Cunnington. Some of the pottery discovered is similar to that from the Avebury fosse—two distinct but overlapping types—the earlier the West Kennet or Peterborough long-barrow type (Neolithic B), the later the Beaker type. This seems to correspond with the later phase of Windmill Hill.

Proceeding westward, mention should be made of the West Kennet long-barrow, from which so much important pottery (Neolithic B) has been obtained. At a short distance NW. of the barrow Silbury Hill stands up boldly on the N. side of the Bath road, at a distance of about 4,750 ft. from the centre of the Avebury Great Circle, in a direction slightly W. of S. It is the largest artificial mound in Britain (pl. xxxiv, fig. 2). Since 1777 excavations have taken place there on several occasions, but the results have had little scientific value.²

¹ The Rev. Bryan King said: 'There are very few lineal yards which are not occupied by causeways, walls, and cottages, all formed of sarsen stone, sufficient, and more than sufficient, to absorb all the stones of the Beckhampton Avenue' (*Wilts. Arch. Mag.* xviii, 377-83).

² The perpendicular height of Silbury is 125 ft.; its diameter at base is from 552 to 555 ft.; circumference at base about 1,660 ft.; diameter at top 103 ft.; angle of elevation 30°.

Stukeley, in his work on 'Abury', published in 1743, says: 'In the month of March 1723, Mr. Halford ordered some trees to be planted on the top of Silbury Hill, in the area of the plain 60 cubits in diameter. . . . The workmen dug up the body of the great king, there buried in the centre, very little below the surface.'

In 1777 a shaft was sunk from the summit by the Duke of Northumberland and Col. Drax. It is to be regretted that no detailed account of these operations is upon record; all that is known was published by Douglas in his *Nenia Britannica*, p. 161. In 1849 the base of the mound was tunnelled from the western 'isthmus' on the south side of the hill. Two pieces of red-deer antler were found, and on the old surface fragments of a sort of string of two strands, each twisted. It is recorded that



Fig. 1. View of Avebury, looking SE., in which the following stones are seen: two standing and three prostrate of the outer circle of the southern inner group, two of the great outer circle, and a stone of the Kennet Avenue
(14 April 1914)



Fig. 2. The wooded part of the NNW. Fosse and Vallum of Avebury, looking WSW.
(2 May 1912)



Fig. 1. The E. earthworks of Avebury, looking NW.

(14 April 1914)



Fig. 2. The E. and SE. earthworks at Avebury, looking NE.

(28 April 1914)



Fig. 1. View taken from the NE. showing the excavation made round the most southern prostrate stone of the outer circle of the southern inner group, Avebury, 1909

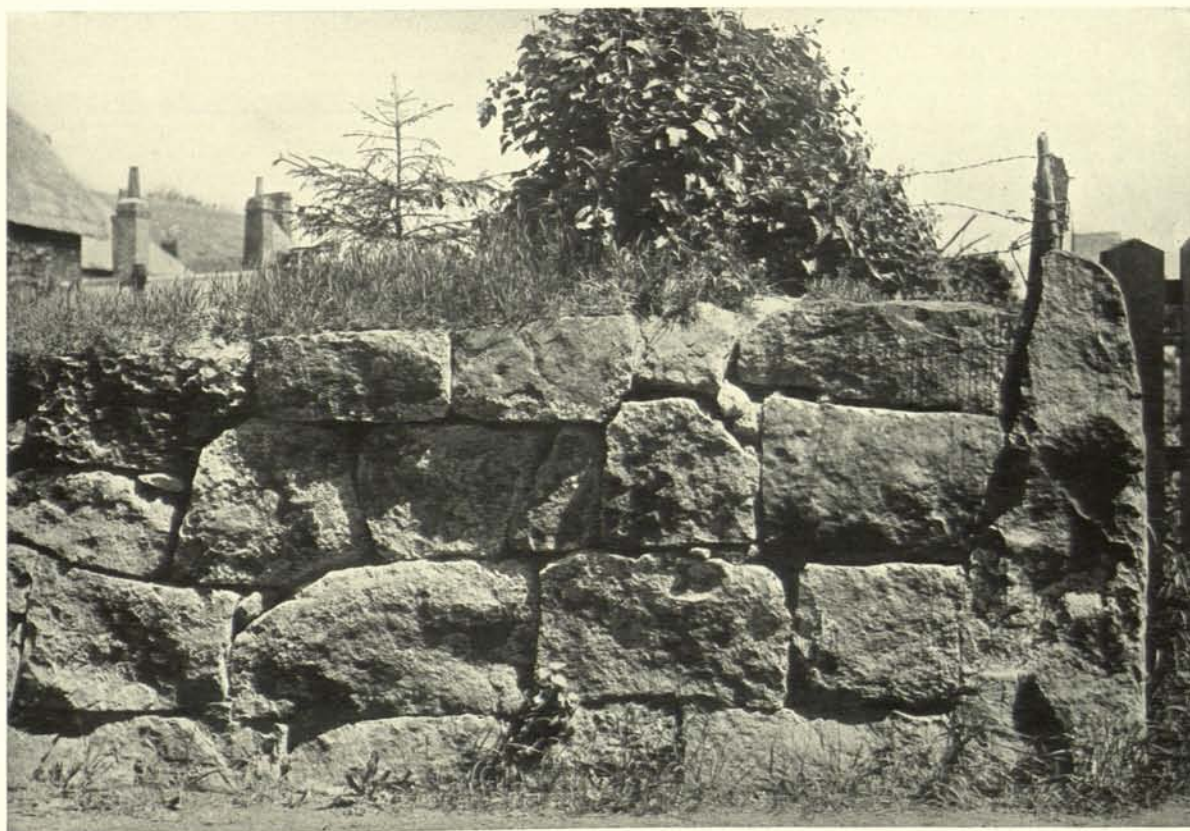


Fig. 2. Dry-stone walling in the centre of the village, evidently the result of vandalism when it was the fashion to break up the great sarsen stones of Avebury



Fig. 1. The southern of the two 'Longstones' at Beckhampton, which fell on 2 Dec. 1911, taken from the E.
(see p. 101) (25 April 1912)



Fig. 2. 'The Cove' at Avebury, from a water-colour by J. Browne, of Avebury, 1825. (see p. 108)

Proceeding round to the WSW., at a distance of nearly a mile from the centre of Avebury, we come to the 'Longstone Cove', 'Longstones', or 'Devil's Quoits'. Aubrey spoke of three upright stones, but two only remained in Stukeley's time. They are now known as 'Adam' and 'Eve', and stand about 95 ft. apart. At the end of 1911 'Adam' fell, and when the Wiltshire Archaeological Society re-erected it a human skeleton and beaker, both in a fragmentary condition, were found, which must have been buried after the original erection of the stone. Some of the packing-stones are seen in the photograph of the monolith (pl. xxxiii, fig. 1); with them part of another beaker was found. The length of the stone was $17\frac{3}{4}$ ft., maximum width 15 ft. 4 in.; estimated weight, 62 tons.¹

Coming round farther in the same direction we reach Windmill Hill on the NW., where Mr. A. Keiller has investigated a part of the well-known Neolithic habitation, consisting of three interrupted ditches—the Inner, Middle, and Outer.

Finally, we will proceed back to Avebury via the Beckhampton Avenue. The Rev. A. C. Smith² collected together the opinions of early writers as to the former existence, or non-existence, of the so-called Beckhampton Avenue. After mentioning Aubrey's silence on the subject, he quotes the words of Stukeley at some length; then follow extracts from Thomas Twining, James Fergusson, and the Revs. C. Lucas, Bryan King, and W. C. Lukis.

'There is no question that, if Stukeley's word is to be believed, he most certainly saw many sarsen stones lying in two, more or less apparent lines west of the circle of Abury; moreover, he speaks of ten stones of this avenue known to have been standing within memory between the exit of the avenue from the vallum and the brook' (Smith, p. 147).

In Stukeley's published works there is no plan of this western avenue, but it has been found that the manuscript he left behind him³ includes a plan of the Beckhampton Avenue. It appears that thirty-four stones belonging to this

the Archaeological Institute came across the shaft 5 ft. by $4\frac{1}{2}$ ft., previously sunk from the summit of the hill, as above mentioned. (*Proc. Archaeol. Inst.*, Salisbury vol., 1849, see papers by Dean Merewether and C. Tucker, 73-81, and 297-303; also Waylen's *History of Marlborough*, 1854, pp. 405-8.)

Excavations were conducted at Silbury in 1867 to ascertain the direction taken by, and the position of, the Roman road with relation to Silbury Hill. See Preb. Wilkinson's paper, *Wilts. Arch. Mag.* xi, 113-18. Further work was undertaken by A. Capper Pass in 1886 (*op. cit.* xxiii, 245-54), and by Sir W. M. Flinders Petrie in 1922 (*op. cit.* xlii, 215-18).

¹ *Wilts. Arch. Mag.* xxxviii, 1-11.

² *Guide to the British and Roman Antiquities of the N. Wilts. Downs.*

³ It is now generally known that Stukeley was most assiduous in the preservation of his various manuscript writings and drawings ('Stukeley, Avebury and the Druids', by S. Piggott, in *Antiquity*, ix, 22-32).

avenue were in existence in 1720-4, all of which had then fallen except three (including 'Adam' and 'Eve').¹ The total length of this avenue, according to Stukeley, was 7,000 ft.; therefore it must have extended about 2,000 ft. WSW. of the 'Longstones'.

II. PREVIOUS EXCAVATIONS AT AVEBURY

Avebury has been the site of archaeological explorations at least on three former occasions, but in each case some of the relics have apparently been lost, and very little indeed from the great 'Temple' is to be found in local or other museums.

In the first instance, excavations were conducted under the direction of the Wiltshire Archaeological and Natural History Society from 29 September to 5 October 1865.² 'Considerable researches' were made by 'sinking holes in many places, running trenches across certain spots, and tunnelling the large external mound.' In the vicinity of 'The Cove', within the north circles, no traces of a burial deposit were discovered. It is stated that just under the turf two or three fragments of *British*³ pottery were found, together with bones of sheep and a small piece of burnt micaceous sandstone. In digging close to the two large stones of 'The Cove', layers of blocks of sarsens, up to a size of 18 in. across, were uncovered; 'they were evidently placed there, and rammed in for the purpose of propping the massive stones in their upright position.' 'Black charred matter' is recorded to have been found, and numerous chips of sarsen. It was thought that fires had been lit here for the breaking up of the stones. 'A good deal of *British* pottery and many animal bones were found in these holes, but no human bones whatever.' To the SE. of 'The Cove' a low embankment was cut through from W. to E., the 'finds' being a portion of a stag's horn and some fragments of pottery. An excavation was also made into the W. face of the ENE. vallum, but nothing was found. Another was made on the SW. at a place where the vallum had been mutilated for the requirements of the modern village; only one fragment of pottery was found here. A third excavation into the vallum was made to the WNW. side of the W. gap without any result in the way of relics. The excavations made in all numbered fourteen, and the fragments of pottery brought to light from the deeper cuttings 'were invariably of the *British* type'. This latter remark is very vague, and without seeing the pottery it would be unsafe to regard the sherds as being all prehistoric.

¹ *Wiltshire Gazette*, 3 Aug. 1922.

² *Wilt. Arch. Mag.* x, 209-16.

³ The author of this paper has italicized the word 'British' in this paragraph.

Those responsible for the excavations of 1865 claim to have fairly upset James Fergusson's view that Avebury was a vast graveyard, and that human bones would be disinterred if search were made.¹

When the Rev. W. C. Lukis was making a plan² of Avebury in July and August, 1881, his colleague, the Rev. A. C. Smith, rector of Yatesbury, resolved to examine the ground with a hope of discovering some buried stones. This was carried out by five workmen, and the spots specially observed were the places where Aubrey and Stukeley showed that stones had stood. The result was that sixteen large sarsens of the outer circle were discovered, also two others in the northern inner group, some buried at a considerable depth. It was Mr. Smith's opinion that these stones had been sunk deep in the ground by means of pits dug beneath them, doubtless to be no longer a hindrance to the plough or for other agricultural reasons. They were covered up again after Mr. Lukis had made his plan, the spots being marked by numbered pegs, all of which have now probably disappeared.

Lukis and Smith also noted and planned several pits in which stones originally stood. Hoare noted eight of these depressions, but Smith and Lukis were able to add twenty-five others not previously recorded. This increased William Long's table of stones in 1857 from twenty-nine to forty-seven. A number of these stones of Smith and Lukis were declared by Stukeley to have been demolished before he made his plan in 1724.

Smith did not find many relics during the work of 1881. Some years ago the Wiltshire Archaeological Society sent me for examination fifty fragments of pottery found by Mr. Smith, and now deposited in Devizes Museum. All of the sherds appeared to me to be post-Roman, mostly of Norman origin. There is certainly no fragment among them that can be definitely regarded as pre-Roman. It is all of the same general character as the pottery found in the British Association excavations in the S. fosse *above* a depth of 4.5 ft. from the surface.

From July 4th to 19th, 1894, excavations were made into the vallum and fosse on the SE. (pl. xxxi, fig. 2) at the expense of the then owner, Sir Henry B. Meux, Bart., under the general direction of his steward, the late Mr. E. C. Treppin, and the immediate supervision of the late Mr. Thomas Leslie, also one of the officers of the estate. This excavation was 420 ft. from the nearest edge of the Marlborough Downs road, the measurement being made on the curve along the berm from the middle of the cutting. The cutting was 6 ft. wide according to the *Wilts. Archaeol. Magazine*; but it is shown as 8 ft. on the

¹ Fergusson, *Rude Stone Monuments*, 72 seq.

² This plan is pl. v in Smith's *Guide to the British and Roman Antiquities of the North Wiltshire Downs*, 2nd edit., 1885.

large plan (pl. xxix), and 140 ft. in length. These dimensions were estimated from observation on the ground in 1908. At the close of the 1894 excavations a westerly extension in the digging was made (6 ft. wide) along the fosse.

The 'finds' consisted mostly of fragments of pottery, one or two worked bones, a few flint implements, animal bones, and red-deer antlers, some bearing evidence of having been used as picks. The latter were found in the vallum, having been thrown up in a damaged condition at the time of their being broken, viz. when the ditch was originally being excavated and the vallum built. Several antlers were found at 4.75 ft. below the summit of the rampart, protected by about half a dozen large blocks of chalk; they were those of slain deer. At the foot of the inner slope of the vallum several pieces of red-deer antler (one piece 17½ in. long) were found near the surface, and in digging here a few flint flakes were also discovered.

Two pieces of worked bone were found between 11 and 12 ft. deep below the crest of the vallum. These are perhaps the 'one or two bits of worked bone, like fragments of paper-knives' mentioned in the *Wiltshire Archaeol. Magazine*.¹

On the old turf line and just above it, Mr. Leslie's rough diary (which the writer has) records the finding of a worked rib-bone and several flints (some worked), a few scrapers, and a quantity of flakes. Several pieces of rough sarsen stone were also found on the old surface.

Mr. Leslie found what appeared to be the grass surface line of an inner rampart, defined by a curved band of vegetable mould measuring about 3½ in. in thickness.² At about the middle of the inner slope, in one place, the soil of the old turf line was found to be nearly 2 ft. thick. It bore evident signs of having been burnt, and a quantity of wood ashes was noticed. It should be mentioned also that the old turf line in this cutting was said to be 2.25 ft. below the level of the adjoining field.

The fosse, apparently, did not reveal any important results, as the excavations were carried only to a depth of 7.5 ft. from the surface of the middle of the silting (about the depth at which the writer came to the upper margin of the chalk rubble in the southern fosse). It would appear, therefore, that when the white chalk rubble was reached, it was thought to be the floor of the fosse. Probably it was crystallized and almost impenetrable by the pick-axe, as the writer found in his later excavations into the fosse. Carbonate of lime had

¹ xxxiii (1903-4), 103, where it is also stated that 'one small piece of British pottery was found on the original surface beneath the vallum'. This digging is also barely mentioned in the same *Magazine*, xxviii, 81.

² In our cutting into the vallum in 1914 there was apparently no indication of an earlier vallum having been surmounted by additional material.

consolidated the chalk and rendered it nearly as hard as concrete, sometimes to a depth of nearly a foot. This would probably have been removed and the digging continued, had Mr. Leslie and those working with him realized that they had not come to the true bottom of the fosse.

Mr. Leslie speaks of Romano-British pottery, which may probably be correct for the fragments found towards the bottom of his comparatively shallow digging, but he does not appear to have dug more than a foot or so into the pre-Roman strata of the silting. He does not speak of medieval pottery in his notes, but those pieces found above 4.5 ft. in the silting would probably, on examination, prove to be post-Roman sherds.

The drawings, relics,¹ and full notes, over which Mr. Leslie unfortunately had no control at the close of the digging, have for the most part been lost beyond recovery it is feared, a circumstance which minimizes the scientific value of the 1894 excavations very considerably.

III. THE EXCAVATIONS, 1908-22

The excavations at Avebury, which are the subject of this report, were organized by the British Association. It was in 1899 that a committee was formed to deal with the subject of the 'Age of Stone Circles'.² In 1901 and 1902 excavations were conducted by the writer at Arbor Low in Derbyshire.³ In 1905 the Stripples Stones Circle in Cornwall was examined, and in that and the following year that circle and four others (the Trippet Stones, and the Leaze, Fernacre, and Stannon Circles), forming a group of five on Bodmin Moors, were surveyed.⁴

In 1908 some changes were made in the Committee,⁵ but Mr. Henry

¹ Two very large antler picks found in the excavations in 1894 were disposed of on 10 April 1915 at the Meux sale at Dauntsey House, near Swindon (lot 1258), and were acquired by the Wiltshire Archaeological Society for Devizes Museum.

² The Committee consisted of Dr. J. G. Garson (*Chairman*), Mr. H. Balfour (*Secretary*), Sir John Evans, Mr. C. H. Read, Prof. R. Meldola, Mr. A. J. Evans, Dr. R. Munro, and Prof. W. Boyd Dawkins. In 1901 Mr. A. L. Lewis was added to the Committee. The two grants made by the British Association for the work at Arbor Low amounted to £50.

³ *Reports, British Assoc.* 1901, 427-40; 1902, 455-66; *Archaeologia*, lviii, 461-98; *Journ. Derbysh. Arch. Soc.* xxvi, 41-77.

⁴ In 1905 Mr. C. H. Read became Chairman of the Committee. The Cornish work was recorded briefly in *Reports, Brit. Assoc.* 1906, 370-82; and 1907, 368-73. A fuller and illustrated report is published in *Archaeologia*, lxi, 1-60.

⁵ In 1908 the Committee consisted of Mr. (afterwards Sir) C. H. Read (*Chairman*), Mr. H. Balfour (*Secretary*), Lord Avebury, Dr. J. G. Garson, Mr. (afterwards Sir) A. J. Evans, Dr. R. Munro, Prof. (afterwards Sir) W. Boyd Dawkins, and Mr. A. L. Lewis.

In 1909 Prof. (afterwards Sir) W. Ridgeway was added, and in 1912 Dr. G. A. Auden. In 1913 Lord Avebury died. In 1915 Prof. J. L. Myres and Mr. H. J. E. Peake joined the Committee. In 1922, after the war, the same Committee remained, but Mr. Lewis and Dr. Munro had died.

Balfour was still the painstaking secretary, and excavations began at Avebury, the work being continued in 1909, 1911, and 1914, and resumed finally in 1922.¹

Important departments in the work, besides the recording of the excavations, were the surveys (the large plan, the various sectional diagrams) and the series of photographs both of the excavations and of the monument as a whole.

Some reference should be made to the financial conditions under which the work was carried out during those five short seasons of excavation at Avebury. Without considerable additional help it would have been impossible to employ up to a maximum of seventeen men from the total grants, viz. £175, made by the British Association; and we take this opportunity of acknowledging the donations below mentioned which were subscribed towards this work.² The total receipts were in the region of £475.

We should also like to thank those who have rendered assistance in carrying out and recording the results of the Avebury excavations. Mr. Henry Balfour during the periods of work paid several visits to Avebury and took a keen interest in the details of the investigations. To Mrs. St. George Gray many thanks are due for assistance in the general organization of the work. Lieut.-Col. L. C. D. Jenner, C.M.G., D.S.O., the Rev. J. G. Ward, and Messrs. J. Peak-Garland, E. A. Parsons, and H. Lawes—landowners and tenants at Avebury—kindly rendered help in various ways. My foremen, Tom Paul of Glastonbury and the late John Lush of Dorchester, led the local labourers in praiseworthy fashion.

In connexion with the record we are grateful to Mr. Stuart Piggott and Dr. Grahame Clark for their respective chapters on the pottery and the flint implements discovered. Thanks are also due to Mr. A. S. Kennard for his list of the mollusca, to Mr. J. Cecil Maby for identifying the charcoals, to Prof. W. Wright for his report on some of the human remains, and to Dr. Wilfrid Jackson for reading my report on the animal remains.

All the photographs and drawings (except those of the pottery and the fibula) are by the author of this report.

¹ Accounts, containing considerable detail, appeared in the *Reports, Brit. Assoc.*, after each period of excavation, as follows: 1908, 401-11; 1909, 271-84; 1911, 141-52; 1915, 174-89; and 1922, 326-33.

² Society of Antiquaries, £32 2s., Royal Archaeological Institute, £12 2s., Marlborough College Natural History Society, £25 15s., Lord Abercromby, £55, Lord Avebury, £35, and the Hon. Henry B. Portman, £15; then there were contributions of from £5 to £10 each from Sir Arthur Evans, Dr. W. M. Tapp, Mr. H. Balfour, the Druitt family, and the following, now deceased, Mr. Heward Bell, Lord Edmond Fitzmaurice, Sir Prior Goldney, Col. W. L. Morgan, and the fifth Marquess of Lansdowne. In smaller amounts the sum of £40 3s. 1d. was raised. Our thanks are due to Canon E. H. Goddard for having collected some of the Wiltshire donations.

The finds,¹ unless otherwise stated in this record, are now preserved in the Museum of the Wiltshire Archaeological Society at Devizes.

IV. DESCRIPTION OF THE PLAN, PLATE XXIX

The greater part of the Avebury survey was made in 1912, from 19th April to 6th May.² The plan was later completed to include the position of the cuttings made in 1922—the last season of this series of excavations.³ For the purposes of the survey forty-two poles bearing small flags were placed chiefly along the crest of the vallum at suitable distances.⁴

The original plan was drawn, for convenience of size, on six sheets of 'squared' paper, and later these drawings were mounted on linen. The scale adopted was 40 ft. to the inch, but the plan is here reduced to 60 ft. to the inch. The area enclosed by the marginal lines represents 71.45 acres. The fosse is generally recorded as enclosing 28½ acres.

The plan shows the approaches to 'the Temple' from Kennet and Devizes on the south, Swindon on the north, the downs on the east, and Avebury Trusloe on the west. Near the junction of these roads the approximate position of the 'centre' of the Great Circle is shown, and a circle has been described having a diameter of 1,108 ft., indicating how much out of the true the great stones were placed.

The stones still standing are shaded, whereas the recumbent stones are shown merely in outline. Holes from which stones have been taken are represented in dotted outlines; only those seen on the ground by the writer have been indicated.⁵

¹ They were numbered consecutively from no. 1 onwards covering the several seasons of work. Several of the numbers will not appear in this report as they refer only to modern and unimportant objects and to medieval and later sherds, but practically all the numbers will be found in the reports to the British Association.

² Owing to the large area to be surveyed in detail, the task was a heavy one, but I received some assistance from my wife and my son (aged eleven years). No excavations were undertaken that year.

In 1908 the Director-General of the Ordnance Surveys informed me that at Avebury the magnetic north was 16° 21' W. of true north, and the north point is shown accordingly.

³ The drawing was not finally completed till January 1935.

⁴ From these points cross-bearings were made with a prismatic compass, all points being checked by tape measurement.

A few small rings on the plan indicate the position in 1912 of certain large trees. The NW. vallum and fosse are wooded (pl. xxx, fig. 2). T.P. indicates 'telegraph pole'.

⁵ Others might perhaps be detected in the winter-time when the grass is at its shortest. Proper excavation will some day no doubt reveal all the socket-holes. My plan shows more of these depressions than are represented in the 25-in. O. Sheet xxviii. 10 (edition 1924).

At first the stones on my plan were numbered, but these have been deleted as being of little or no value.

The inner northern megalithic group shows the remains of a circle 320 ft.¹ in diameter (a medial line being taken), enclosing the two standing-stones—part of 'the Cove'.² To the SE. of this we have shown on the plan the only buried stones exposed during these excavations; the digging was done in 1922 at the close of the work here described.³ This broken group of stones may be the recumbent stone opened out in 1865 by Smith and Cunnington.⁴

To judge from Stukeley's plan, etc., there can be little doubt that there was a concentric circle here within the larger circle, which is believed to have

¹ Stukeley's and Crocker's plans give the diameter as 410 ft., while Lukis says 'not more than 270 ft.'

² The southern of the remaining stones is 17 ft. in height above the ground-level; it leaned in 1922 to the N. 33 in. out of the perpendicular; in 1881 there is a record that it overhung to the extent of 27½ in. The western stone is 14 ft. 7 in. in height, with a width of the same dimensions; in 1881 it overhung 15 in. The northern stone fell in 1713 and was broken up; it is said to have been 7 yards long.

³ For some years the writer had known of part of a sarsen stone showing one or two inches above the surface in the farmyard near 'the Cove', and probing revealed the fact that it extended for some distance. Expecting that this stone might be of sufficient importance to mark on my plan, this area was dug over by two men. The stone proved to have been buried by penetrating the solid chalk for the purpose. In plan it measured 5.8 ft. in length by 4.5 ft. in width at the W. end; at the E. end it was 3.5 ft. wide; it was a stone apparently of almost quadrangular cross-section; its thickness at the W. end appeared to be 1.7 ft.

Extending the digging both N. and S., two other stones were uncovered, the most southern reaching the present surface at the W. end. The most northern stone was only 5 in. deep below the surface at the W. end; at the E. end it was rather deeper. It was found that the three stones covered a length of 16.5 ft. The S. piece was triangular, 7.3 ft. in length, with a maximum width at the W. end of 6.2 ft., where the thickness of the block appeared to be 1.25 ft. The most northern stone was of more or less triangular shape, having a maximum length of 7.5 ft., and a maximum width of 4.15 ft.; thickness about 1.75 ft. The N. and middle pieces were only 0.35 ft., and the middle and S. pieces 0.75 ft. apart. The middle stone sloped eastwards at an angle of some 45°; the others were lying fairly flat.

These stones, which were covered up again at the wish of the owner, Mr. J. Peak-Garland, are to the E. of the two great standing-stones known as 'the Cove'. The nearest parts of the N. and middle stones are about 29 ft. E. of the nearest or highest stone of 'the Cove'.

It is surmised that these stones originally formed one large stone which might possibly be Stone 'D' of Hoare's plan, buried in the position now found; if so, it formerly stood at a distance (according to Hoare) of 83 ft. from the nearest stone of 'the Cove'.

In connexion with the position of stones in the vicinity of 'the Cove', the photograph of a water-colour by J. Browne of Avebury, dated 1825, here reproduced for the first time, will be of interest (pl. xxxiii, fig. 2). It appears here with the kind permission of Mr. Herbert Druitt of Christchurch, Hants.

The drawing measures 10¼ in. by 6¾ in., and the following contemporary information accompanies it: 'The Cove or place of Sacrifice in the Serpentine Temply at Abury. . . . The stone to the right is that at the foot of which the Alter stone for the sacrifices was placed; the marks of fire are still upon it. A stone was originally placed to the left of it accordant with the central one to form the Cove. That to the left in the picture is one (stone) of the smaller circle around it.'

⁴ *Wilts. Arch. Mag.* x, 212.

been about 170 ft. in diameter; but there is no trace of its former existence on the surface of the ground to-day.¹

It may be noted that the outer of the northern circles has only four stones showing at the present time—two standing and two prostrate. According to Stukeley's plan there should originally have been twenty-nine stones in this circle, at an average distance of 30 ft. apart. A small segment of the southern part of the circle is represented to-day by a part of the village street; and the plan shows that the nearest points in this circle and the larger of the southern group are about 64.5 ft. apart.

The larger circle of the southern group has an approximate diameter of 336 ft.,² and it is now represented by two standing and three prostrate stones on the S. and SW. (pl. xxx, fig. 1); also by seven depressions from which stones have been removed in the southern half of the circle. On the NW. the former position of another stone is indicated. There appear formerly to have been twenty-eight or twenty-nine stones in this circle, at an average distance of about 30 ft. apart.

There is decided evidence of a smaller circle, about 154 ft. in medial diameter, in this group, and, judging from the position of the four stone-holes, it would appear to have been precisely concentric with the larger circle of the southern group.

The true centre of these mathematically accurate circles is marked by a decided depression from which the so-called 'Obelisk' was removed.³

Mention should be made of the position of the 'Ring-stone' which stood in Stukeley's time. The centre of the depression marking the spot is 60 ft. S. of the southern outer circle, and 14 ft. W. of a line continued through the centre of the N. and S. groups of circles.

The plan also includes the only remaining standing-stone of the Kennet Avenue close to Avebury, at a distance of 280 ft. SSE. of the nearest point of the Great Outer Circle, to which we must now turn.

Bare allusion has already been made to the Great Outer Circle which follows the fosse on its inner side. We have put the approximate diameter at

¹ We have ventured to dot in a circle on the plan, although its position may not be accurate by several feet.

² Stukeley's and Crocker's plans give the diameter as 410 ft., while Lukis makes the dimension 320 ft.

³ The Rev. A. C. Smith (*North Wilts.*, p. 142) mentions an urn full of bones 'found towards the centre of the southern temple in 1880' by Mr. Pratt when he was sinking a hole for a flagstaff, on the occasion of a village fête in that field. The urn was broken to pieces, and the fragments carried off by the children.

This burial by cremation was probably deposited here considerably after the construction of the circles.

A traditional 'sanctity' still lingers round this spot.

1,108 ft., but it is considerably out of the true, and few of the stones actually touch the circumference of the circle described on the plan. The most accurately placed stones were in the NW. and SE. quadrants. There is much flattening (inwards) on the SW., a short flattening on the N., and a decided outward bulge on the NE.

With regard to the stones it is estimated that just over one hundred of these gigantic sarsens formerly occupied this ring, of which only nineteen are seen to-day—ten standing and nine recumbent (some partly overgrown). The average distance apart was apparently in the region of 38 or 40 ft.

The most southern part of the outer circle of the southern group is 134 ft. from the line of the Great Outer Circle to the S., whereas the most northern part of the outer circle of the northern group is 249 ft. from the nearest part of the Great Outer Circle to the north.

The plan further shows that the average diameter of the vallum (pl. xxxi, figs. 1, 2) measured from crest to crest is about 1,400 ft., and its circumference (measured along the crest) about 4,440 ft.

It remains to be said that the buildings indicated on the plan are those which existed in 1912. All were measured on the spot and not taken from the 25-inch O. Sheet. There are no buildings of great age within the earthwork, and the ancient church and manor-house are outside and well to the north of the western entrance approached by the Beckhampton Avenue.

The position of all the excavations is shown, viz. Cuttings I, II, III, VIII, and IX across the fosse; Cuttings IV, V, VI, and VII on the entrance causeway; and Cutting X through the vallum.¹ Sir Henry Meux's excavation into the fosse and vallum is outlined on the SE. quadrant; and an arrow points to Silbury Hill, the centre of which is 4,750 ft. a little W. of S. from the centre of the Great Outer Circle of Avebury. Plate xxxiv, fig. 2, shows Silbury taken from a field near the SW. vallum of Avebury, the Kennet stream in the foreground.

V. CUTTING I, FOSSE

This cutting was 24 ft. long, as the plan, pl. xxix, shows, and its most westerly margin was about 156 ft. from the middle of the hedge along the road approaching Avebury from the south. The main cutting was 37 ft. wide, but on the line of the sectional diagram (pl. xxxvi, fig. 1), taken on the line E.F. of plan, the width was 45 ft., in order that the profile of the fosse might be shown to the best advantage.

In plotting the sectional diagram it was found that the present surface of the silting of the fosse in this part was about 13.7 ft. lower than the original ground level, viz. the

¹ The extent of the excavation on the N. and E. sides of the largest prostrate stone of the southern inner group is also indicated. See pp. 131-3, and fig. 5 for details.

level of the adjacent field in which the remains of the outer circle of stones are situated. It seemed rather remarkable that the Avebury fosse had not silted up to a greater extent.¹

As it was anticipated that the fosse might prove to be deep, ledges had to be left in the silting at different stages to allow of the material being thrown up from the lower levels with comparative ease (pl. xxxv, figs. 1, 2); and it was found necessary in a large cutting of this sort to wheel out nearly all the material.

The turf and turf-mould were found to reach to a depth of 0.8 ft.; in it several modern sherds and scraps of iron were found.² A fine gritty mould came next, which has been called 'surface silting'.³ The average depth of this in the middle was 3.4 ft. from the surface, tapering off to both sides of the ditch. In removing this layer horizontally earlier deposits *on the sides*, viz. mixed silting and chalk rubble, were revealed. As will be seen by the diagram, the strata are deepest in the centre of the fosse, the surface of each deposit, as viewed from above, presenting a decidedly concave outline. The deeper a ditch, the more pronounced one expects to find this characteristic. Silting falling into an open ditch from either side naturally covers the profile very rapidly, and the surface of the silting as it increases from bottom to top is always concave, more so in the early stages of filling than later.

The next deposit—mixed silting—consisting of mould with a larger proportion of small pieces of chalk, extended to an average depth of 8.6 ft. in the middle of the silting. This deposit was also on the curve. In most places the bottom 2 ft. of this silting was found to be of a finer kind with a smaller admixture of bits of chalk, and it is differently represented in the diagram.

When the middle of the mixed silting was reached, the tracing of the hard chalk walls of the fosse on both sides to the depth we had excavated was proceeded with. This done, the work from day to day became temporarily checked by the caving in of parts of the vertical (or nearly vertical) face of the silting, sometimes two or three tons falling in one night. This is well seen in the photographs (pl. xxxv, figs. 1, 2). In the mixed silting, at depths of 5, 6.3, 6.3, and 7 ft. respectively, four sarsen boulders were found, each about 2 ft. across. In this deposit an iron medieval arrowhead, No. 56, was found.⁴

¹ We heard some reports that the fosse had been cultivated as arable land *circa* 1850-60, but were unable to substantiate those statements on making inquiries from inhabitants still living.

² At a depth of 1 ft. were found a farthing of William III, 1698, and a small Jacobean clay pipe.

³ Within 3 ft. of the surface and below the turf-mould were found two oblong-headed horseshoe nails (no. 15), part of a horseshoe (no. 17), and tang and portion of a blade of a small iron knife (no. 75).

⁴ It was picked up by a reliable excavator at a depth of 7.8 ft. below the surface. It is quite probable that a small pointed object like this might work its way down from its original position in the silting by means of rabbit and other holes to a much lower level. On the other hand, as the excavator had just begun a fresh 'spit', earth containing the arrowhead may have fallen from a higher level beforehand without revealing the object. However, no. 56 is shown in the diagram (pl. xxxvi, fig. 1) at the depth at which it was picked up.

The arrowhead has a socket of circular section; shank nearly straight and bevelled abruptly near the point where the cross-section is rhombic, length $1\frac{1}{4}$ in. The late Viscount Dillon, P.S.A.,

The mixed silting proved to be an interesting deposit as far as fragments of pottery were concerned, for there were three definite archaeological types. In the upper third, and *above* a depth of 4.5 ft. from the surface, Norman and medieval pottery¹ was found commonly, indicating not only that Avebury was overrun during those times, but also that since early Norman times about 4.5 ft. of silting had accumulated in this part of the fosse. Secondly, pottery of the Roman period was found at depths varying from 5 to 6 ft. in the middle of the mixed silting deposit; and thirdly, two fragments of pottery (no. 44), belonging to the Peterborough ware—Beaker horizon—were found in the lowest third of the mixed silting at a depth of 7 ft. from the surface. In the middle division of this area twenty-five fragments of pottery were collected, all of Romano-British type and unornamented. Some of the pieces were small, and it is possible that a few of them may be post-Roman, but all undoubtedly are pre-Norman. The pieces of Roman ware associated with the Romano-British pottery consisted of a very thin fragment, brick-red on the two surfaces, light grey inside (no. 80, depth 5 ft.); a handle of a vessel of similar character (no. 109, depth 6 ft.); a fragment of thin grey pottery (no. 116, depth 5.7 ft.); a large piece of the side and neck of painted New Forest grey pottery painted a dull black on both surfaces (no. 98, depth 5.8 ft.); and a piece of tile, *tegulum* (no. 24, depth 5.4 ft.).

The coarse Bronze Age type of ware, containing grains of quartz, survived into Roman times, and is occasionally found with Romano-British sherds. But when found in deep deposits, unassociated with Romano-British pottery, it is generally safe to regard it as being of prehistoric manufacture. In this part of the Avebury fosse the highest pieces of the early type were found at least 1.2 ft. below the Romano-British type. The position of the various qualities of pottery in the mixed silting was most satisfactory as regards chronology.

To complete the account of the pottery from Cutting I it is necessary to turn to the vast accumulation of chalk rubble, from 8.6 ft. below the surface of the silting to the bottom of the fosse. The only fragments of pottery found in this deposit were three small pieces of prehistoric pottery described on p. 138. No. 25 was found at a depth of 7 ft.; no. 29 at 8 ft.; and no. 93 at 12.5 ft. There is no question about the depth of this last-named fragment, which was found in my presence by the foreman (who did all the important digging at low levels). All are shown in the section, pl. xxxvi, fig. 1, and, like no. 44, are apparently of late Neolithic date.²

With one exception the other 'finds' in the chalk rubble were of little value as evidence of date. But that exception was an important one, viz. the finding of nine red-

said, 'The Avebury specimen is a medieval arrowhead of the "pile" class, and for use with the long bow. It is an interesting and rare example, but the actual date is quite uncertain.' *Vide* also on Medieval Arrowheads, *Gentleman's Mag.* cii, 1832, pt. i, p. 114.

¹ Among these sherds is a large proportion of pieces of rims and bottoms of vessels; less frequently handles of pots were found, and fragments bearing definite traces of glaze. This pottery bears a close resemblance, both in quality, form, and general character, to that found in my excavations in the large camp known as 'Castle Neroche', 7 miles SSE. of Taunton (*Proc. Som. Arch. Soc.* xlix, ii, 23-53).

² Two fragments of Romano-British pottery were found in the chalk rubble, but quite high up, *close to the inner wall* of the fosse, and as evidence of date their position was unimportant.



Fig. 1. Bottom of the Fosse, Cutting VIII, Avebury, taken from the floor looking WSW, showing the stratified silting (9 May 1911)

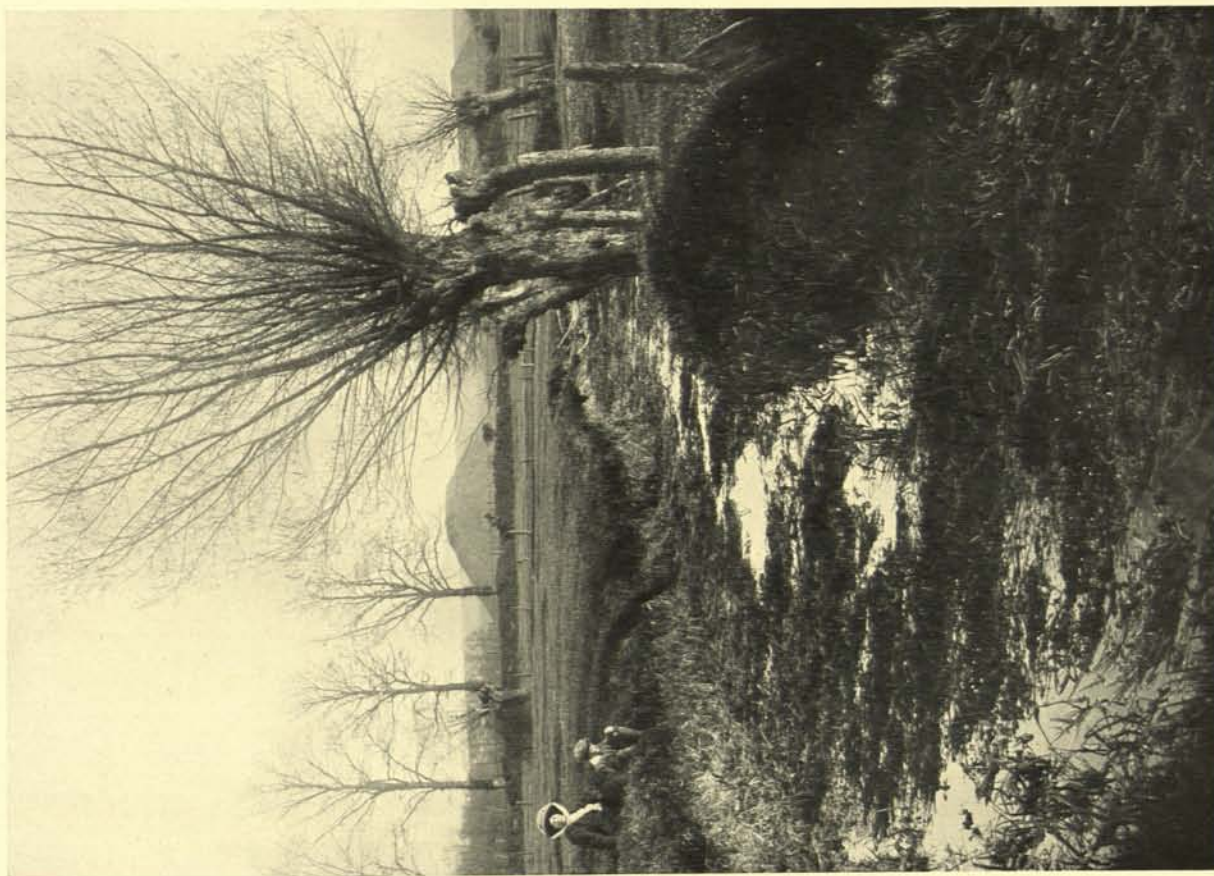


Fig. 2. Distant view of Silbury Hill taken from near the SW Vallum of Avebury, looking S., the Kennet river in the foreground (4 May 1911)

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Fig. 1. View of the excavation of Cutting I, Fosse, taken in 1908, looking SW. The man holding the 10-ft. levelling-rod stands on the bottom of the ditch



Fig. 2. Another view of the same excavation, showing a much larger area of the solid chalk floor of the fosse; also a mass of loose silting

deer antler picks (nos. 89, 90, 91, 94, 95, 131, 133, 135, and 136), for the most part fractured and incomplete, but capable of considerable repair,¹ resting on the solid chalk floor of the fosse—thrown away when they became useless as tools (pl. xxxvi, fig. 1, and p. 150). Some of these picks proved to be excellent specimens, and nos. 89, 90, 133, 135, and 136 are figured in pls. xlvii and xlviii. It is difficult to realize how this stupendous fosse was excavated out of the solid chalk by means of antler picks only. There can be no doubt that the hardest chalk must have been loosened, at least to some extent, by the blows of flint hammers and mauls. The other appliances used in this work would probably be wooden and bone shovels, and baskets and ropes to haul the chalk to the surface. Close to the bottom a fragmentary shoulder-blade bone was found in a very bad state of preservation, and it was uncertain whether it had been used as a shovel.²

A flint knife (no. 96) was found at a depth of 13 ft. (pl. xlvi and pp. 142, 143), and worked flint flakes at 7.3 ft. and 10 ft. (nos. 85 and 76). Another flint knife (no. 132) was found on the bottom of the fosse at a depth of 17.8 ft. below the surface. It is fully described on p. 143, and both faces of the implement are figured in pl. xlvi.³ A piece of human skull-bone (no. 87) was found at an approximate depth of 12 ft., and a human clavicle (no. 113) at a depth of 8.5 ft. See table, p. 148, for other human remains found in Cutting I.

The chalk rubble covered the sides of the ditch up to the top; in the middle of the silting the deposit was reached at a maximum depth of 8.6 ft., and extended downwards to the floor of the fosse to a maximum depth of 17.6 ft., and a minimum depth of 16.7 ft., from the surface. The sectional diagram shows the depth as 16.8 ft. (pl. xxxvi, fig. 1). The clearing of the smooth, flat floor of the fosse was much impeded owing to the repeated falls from the upright face of the silting. However, after perseverance, a length of 17 ft. was cleared at the bottom, the length of the excavation on the surface being 24 ft. The average width of the bottom of the fosse was 16.7 ft.⁴ The inner wall of the fosse did not vary in slope very considerably, as seen by the diagram (inclination about 59°), but the lower 5 ft. of the outer wall was very steep in most places (maximum inclination 80°). No toolmarks were observable on the walls of the fosse, near the bottom or elsewhere.

THE SILTING IN CUTTING I

See sectional diagram, pl. xxxvi, fig. 1.

(Dimensions taken in the middle of the silting)

1. Turf and turf-mould, thickness 0.8 ft.
2. Surface silting, average thickness 2.6 ft.; fine loamy silt of light-brown colour, without lumps of chalk, washed in and partly the result of denudation, but mostly derived from silt drained into the fosse from the roadway.

¹ All the picks and other antler and bone implements found in the Avebury excavations were restored by Mrs. St. George Gray.

² Three bone shovels, described on pp. 115-16, were found at the bottom of the fosse in Cutting II.

³ Other flint implements and flakes from Cutting I are recorded in the tables on pp. 143, 145.

⁴ The width of the fosse at 5 ft. above the bottom was 21.5 ft. on the west; near the east, 20.5 ft.; and on the east, 22 ft.

3. Mixed silting, average thickness 3.2 ft., consisting of rather darker loamy mould than the surface silting, and containing a fair proportion of small lumps of chalk from $\frac{1}{4}$ -inch across to about 2 inches. On the W. side of the cutting a hard band of lumps of chalk was noticed across the middle of the stratum (seen in diagram, pl. xxxvi). Some of the lumps were 3 or 4 in. long, and resulted from a sudden fall of chalk from the profile of the fosse. This layer, 2 in. thick, was so hard that the foreman thought at first that the bottom of the fosse had been reached.

4. Fine mixed silting, average thickness 2 ft. A narrow, curved layer, consisting of fine chalk mixed with a small proportion of light yellowish-brown loam or mould.

5. Chalk rubble, maximum thickness 9.2 ft. The upper layers of this deposit consisted of rather small lumps of chalk seldom more than 3 in. across, and usually much smaller. Some of the pieces were found agglutinated as if by the lime contained in water which had percolated through the silting. The lumps of chalk were larger towards the bottom. Occasionally thin curved seams of mould were observed in this deposit, caused by the falling of turf and mould from the margins of the open fosse as it was gradually widening from natural causes, and by the deposit of surface mould thrown up undesignedly during the process of building the vallum and slipping back into the fosse.

VI. CUTTING II, FOSSE

At 87 ft. to the W. of the W. hedge of the road leading into Avebury, and at 69 ft. to the E. of the W. margin of Cutting I, another section was made across the silting of the fosse. This was Cutting II, which is, as the plan pl. xxix shows, like Cutting I, 24 ft. in length. Being nearer the road, which is on higher ground, it was obvious there would be a greater amount of surface silting to remove than in Cutting I.

In the endeavour to ascertain the extent of the fosse in this position, we caused several trial-holes to be made eastward of Cutting II to follow the upper margin of the walls of the fosse. This was satisfactory as far as it went, and it was found that instead of the fosse narrowing, it widened as it approached the hedge and road. This was as far as we could go in this inquiry until Cutting III across the fosse was tackled subsequently (p. 117).

As in Cutting I the new cutting was worked to a width of 37 ft. in most parts, but along the E. margin the width was increased to 46 ft. (see sectional diagrams, pl. xxxvii). The surface silting was found to extend to an average depth of 5.8 ft. in the middle. Nothing worthy of record¹ was found in it, except a number of sherds of medieval pottery.²

The next deposit, mixed silting, consisting of mould with a larger proportion of small pieces of chalk, extended to an average depth in the middle of 10.3 ft. from the surface. The lower part of this silting (thickness 1.7 ft. in the middle) was found to be of a finer kind with a smaller admixture of chalk.

¹ The 'finds' here included an Irish halfpenny of George III and a seventeenth-century tobacco-pipe of clay (maker's mark, 'Thomas Hunt'). The upper deposits had apparently been disturbed and further inquiries led me to believe that the surface soil in this part of the ditch had been cultivated up to the third quarter of the nineteenth century.

² No. 126 (marked in the section) is a piece of base and rim of an early medieval pot, with fingermark indentations round the edge of the bottom; depth 3.2 ft.

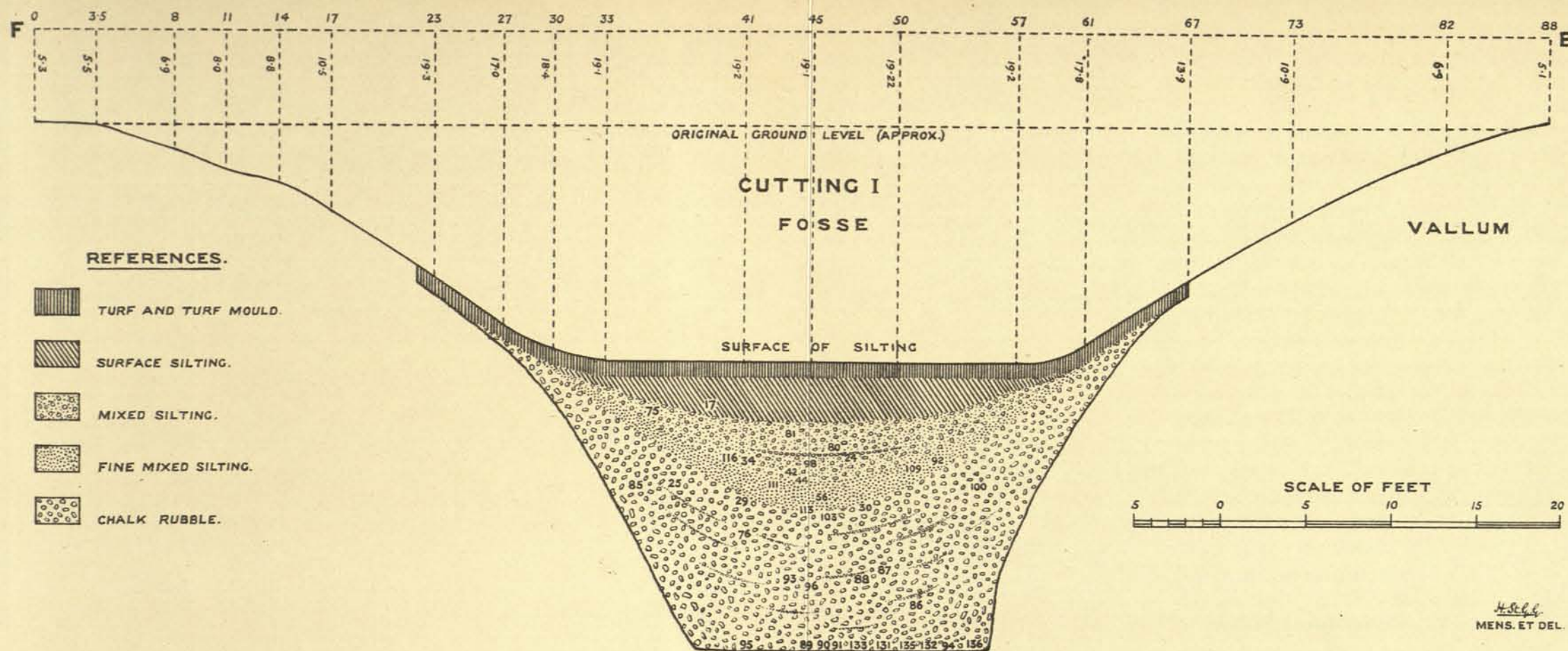


Fig. 1. Sectional Diagram of Cutting I (West face) across the Fosse, on the line E-F of the Plan

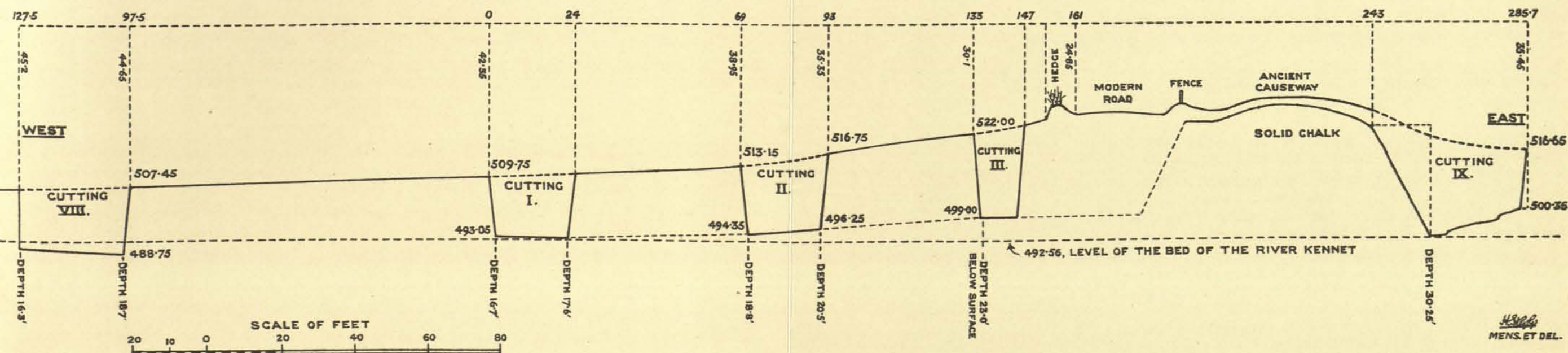


Fig. 2. Section along the line of the five Fosse Cuttings (Nos. I, II, III, VIII, and IX) showing the relation of the bottom of the Fosse to the level of the bed of the River Kennet; also the position of the Ancient Causeway and the Modern Road into Avebury from the South. The line of this Section is indicated on the Plan by a dotted line

Eight lots of Roman and Romano-British pottery were found in the mixed silting at depths varying from 5 ft. to 8 ft.¹ One piece, no. 118, was picked up at a depth of 8.4 ft., but it may have tumbled down during the digging. Several pieces of pottery of early Bronze Age type, represented by nos. 119, 123, and 134, were also found in the mixed silting at depths between 8.5 ft. and 9.5 ft. and above the pure chalk rubble (see pp. 139-40). No. 123 is illustrated in fig. 6. This deposit also produced human remains (nos. 117, 122) in two places at a maximum depth of 9 ft. (p. 148). Four flint scrapers, nos. 106, 110, 125, and 138 (pp. 143-4), were found in this silt at depths varying from 5.3 ft. to 9.5 ft.; nos. 106 and 138 are figured in pl. XLVI.

Between the mixed silting and the chalk rubble in the middle part of the silting, tapering in both directions, a seam of crystallized chalk, almost impenetrable to the pick-axe (indeed, it broke two points), was reached; it occurred at the same level in all the cuttings made. Carbonate of lime had consolidated the chalk and rendered it as solid as concrete, to a thickness of 1 ft. in places. The workmen considered it to be the bed of an ancient watercourse! In any case, there must have been a considerable amount of soakage of water to deposit carbonate of lime in such quantity.

Owing to the curvature of the stratum in the silting, the chalk rubble on the sides of the fosse extended almost to the top; in the middle it was reached at a depth averaging 10 ft. From here to the bottom, as elsewhere, silted chalk rubble only had to be removed, with thin seams of mould caused by occasional falls of turf. A piece of pottery of the early Bronze Age type was found at a depth of 8.7 ft. near the southern margin of the fosse. No other pottery was discovered, but three pieces of worked flint, nos. 105, 112, and 146 (pp. 143-4), were found at depths between 6.5 ft. and 9.5 ft. near the sides of the fosse; no. 105 is illustrated in pl. XLVI.

Two antler picks, nos. 124 and 128, were found on or close to the bottom of the fosse, depth 16.5 ft. and 18.8 ft. respectively (p. 151). In Cutting I a fragmentary shoulder-blade bone was found near the bottom of the ditch. In Cutting II three well-defined specimens of shovels (*scapulae*) were found, two (nos. 129 and 137) shoulder-blades of ox (*Bos longifrons*) being found on the floor of the fosse at depths of 18.5 ft. and 18.8 ft. respectively; the other (no. 145) was a *scapula* probably of a young ox, found at

¹ As these eight lots are not mentioned elsewhere, a brief description will be given; it will be unnecessary to state the depth in each case as all the finds are marked in the sectional diagrams, pl. XXXVII:

No. 101. Piece of hard grey Roman pottery, painted brick-red inside and out; thickness, 7.5 mm.

No. 102. Fragment of thin Roman pottery, pale grey on the inner face, brick-red on the outer.

No. 104. Part of base of a coarse brown pot; Romano-British.

No. 108. Small piece of red pottery of a smooth soft paste, Roman. Probably worked its way down through a hole into the upper part of chalk rubble.

No. 114. Several fragments of a lathe-turned vessel of brown ware of a very sandy texture; Romano-British.

No. 115. Three fragments of Roman vessels of different qualities; one of sandy texture like no. 114; another greyish-brown ware; the third a fragment of thin grey pottery painted brick-red on both sides.

No. 118. Piece of thin grey ware, and a fragment of dark brown ware; Roman.

No. 130. Two pieces of Romano-British dark brown ware of sandy texture like no. 114.

a depth of 14.3 ft. in the chalk rubble, having apparently slipped down from the vallum before it became turf-clad. The two shovels, nos. 129 and 137, measure 13 $\frac{3}{4}$ in. and 12 $\frac{1}{2}$ in. in length. In nos. 129 and 145 the anterior spine has been cut away, or partly removed, and from this fact and the worn appearance of these three specimens, together with the great scarcity of other animal remains except the antler picks at such a great depth, we regard it as more than probable that these *scapulae* were used as shovels in the original excavation and clearing of the fosse.¹ The three specimens are illustrated in pl. XLVIII.²

The bottom of this part of the fosse was just as smooth as in Cutting I, but it narrowed slightly. In Cutting I the width at the bottom varied from 16 ft. to 17.3 ft. In the W. half of Cutting II it varied from 11.8 ft. to 17 ft., and in the E. half it averaged 14.3 ft. The bottom was found to rise slightly towards the E., and along the E. margin a ridge (height about 0.9 ft.) of solid chalk crossed the fosse, as shown in one of the sectional diagrams, pl. XXXVII; in the middle of the ridge was a slight hollow.

The walls of the fosse in the lower parts became steeper and were very irregular, there being considerable projections of hard chalk left apparently for no particular purpose. We experienced no fall from the E. face of the silting, it being sloped as the excavation proceeded, finally to the extent of 4.5 ft. out of the vertical.

The depth of Cutting II from the surface of the silting on the W. was 18.8 ft.; on the E. 20.5 ft.; the difference was accounted for partly from the fact that the surface rises gradually towards the road.

The fossils from the fosse, both in this cutting and Cutting I, were all *Inoceramus labiatus* (Schloth.), except two, which were *Rhynchonella Cuvieri*. This supports the conclusion recently arrived at by H.M. Geological Survey that the occurrence of *Inoceramus labiatus* is proof of the zone of *Rhynchonella Cuvieri*.

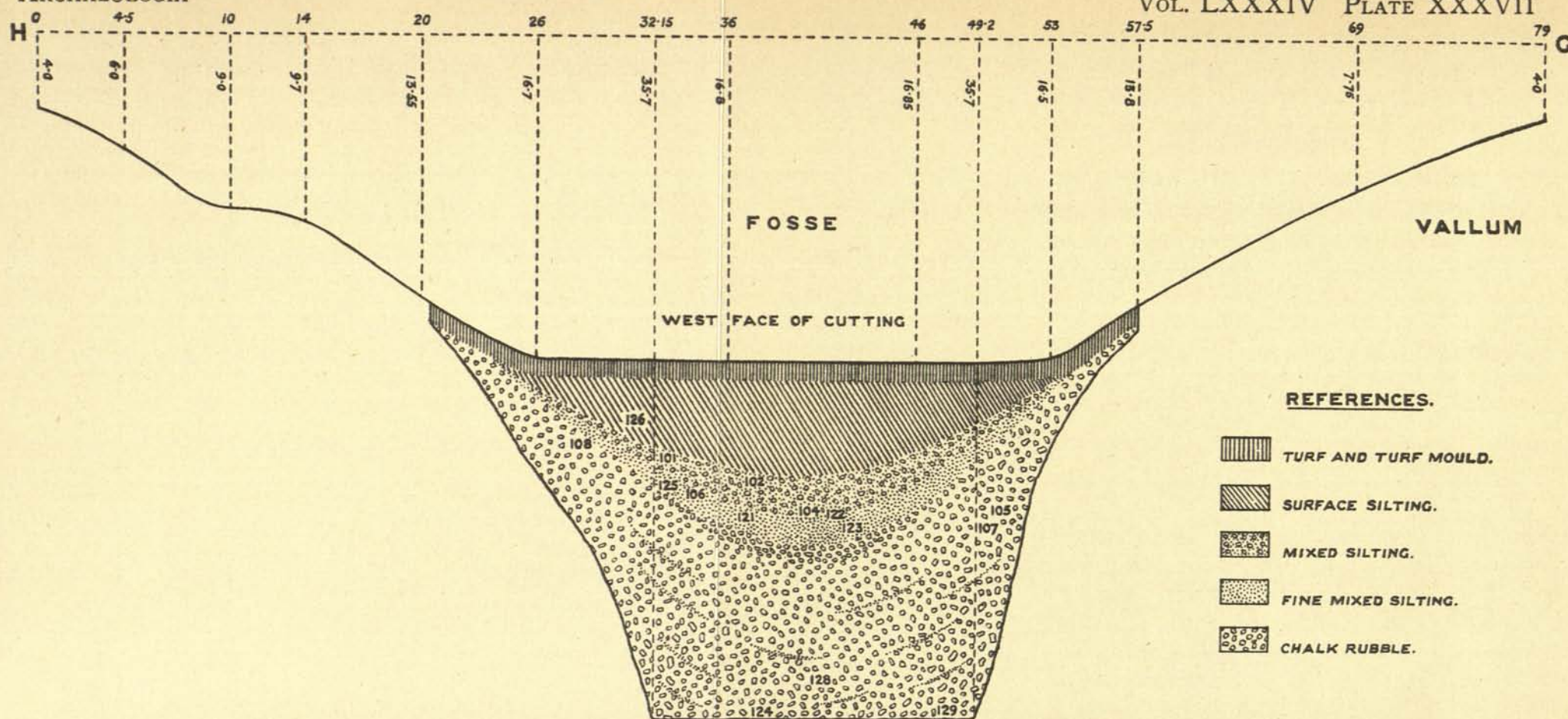
A pebble, sent early in 1931 to the late Dr. H. H. Thomas, F.R.S., petrographer to the Geological Survey, was found at a depth of 5.5 ft. (stratum unrecorded). He wrote: 'It

¹ In *Archaeologia*, lxii, 113, the late Horace W. Sandars said, 'Some doubt has been expressed as to whether *scapulae* were employed for such purposes (shovelling chalk), but further and convincing proof of such usage has recently been afforded by the investigations carried out by Mr. H. St. George Gray at Avebury, where similar implements in association with deer-horn picks have been found at the bottom of the deep ditch that surrounded the monument.'

Similar bone shovels have been found at Cissbury (one is figured in *Archaeologia*, xlv, 345). But perhaps the most interesting are the five specimens found in the Harrow Hill flint-mines, 1924-5, and described by Drs. Eliot Curwen and E. Cecil Curwen in *Sussex Archaeol. Coll.*, lxxvii, 103-38; they include a unique example with the neck of the bone hollowed out by a deep tapering groove for the insertion of a handle (see illustrations in their paper, p. 111). Dr. E. C. Curwen has also written some notes on the use of these *scapulae* as shovels (*op. cit.*, 139-45). Portions of three worked shoulder-blades were found at All Cannings Cross; see Mrs. Cunningham's book on the subject, pl. 10, figs. 1, 2, and pl. 14, fig. 3. A specimen was found in a flint-mine at Stoke Down, near Chichester, and is now in the Brighton Museum (*Proc. Preh. Soc. E. Anglia*, iv, 89).

Two shoulder-blades of somewhat similar character were found in the Glastonbury Lake Village; see the work on the subject by Dr. A. Bulleid and Mr. H. St. George Gray, ii, 415. They have been found in rather large numbers in the excavations being conducted at the Meare Lake Village, 4 miles W. of Glastonbury; a small proportion of them is ornamented.

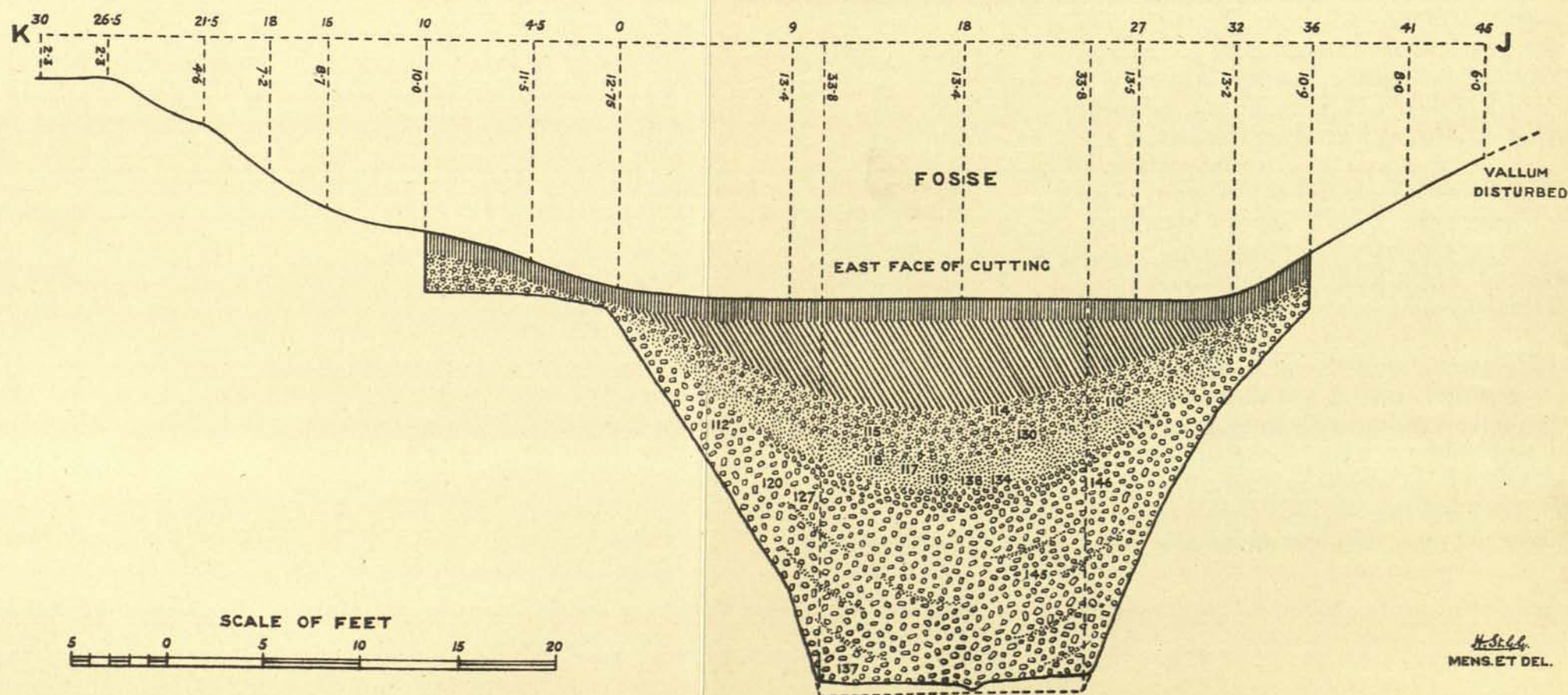
² No. 129 is preserved in the British Museum, no. 137 at Devizes, and no. 145 in the Pitt-Rivers Museum at Oxford.



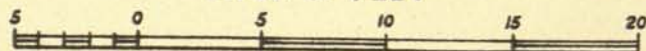
REFERENCES.

-  TURF AND TURF MOULD.
-  SURFACE SILTING.
-  MIXED SILTING.
-  FINE MIXED SILTING.
-  CHALK RUBBLE.

CUTTING II



SCALE OF FEET



H. St. G. DEL.
MENS. ET DEL.

Sectional Diagrams of Cutting II across the Fosse, on the lines G-H and J-K of the Plan

is an unusual rock and I do not remember anything like it from Windmill Hill. It is compact and certainly water-worn. In cutting a small section from it I find that the rock is a decomposed porphyrite or andesite, probably of North Wales derivation. As, however, the specimen is probably a drift pebble, the original source means little.

VII. CUTTING III, FOSSE

The E. edge of Cutting III was only 6 ft. W. of the W. margin of the hedge bounding the modern road into Avebury from the south. A length of 14 ft. of fosse was marked off for examination. It was close to the roadside gate, and was dug to ascertain if the fosse rounded off to form a solid entrance-causeway (see photograph, pl. xxxviii, fig. 1).

Both Aubrey and Stukeley apparently show the position of the Kennet Avenue entrance into Avebury as being on the site of the present road, and this fact rather led us to suppose that the fosse on the W. side of the solid entrance-causeway must have terminated in about the position of the present W. hedge. But our excavation into the fosse of Cutting III proved that their plans are incorrect and misleading.

In the previous year we made several trial-holes to ascertain the direction towards the E. taken by the upper margin of the walls of the fosse exposed in Cutting II. In all the holes nearest to Cutting II the solid chalk upper border of the fosse-wall was revealed; but instead of the fosse narrowing it widened as it approached the hedge and road.

Before excavating a part of the area called Cutting III we dug a trench about 32 ft. long and 5 ft. wide, connecting the N. face of Cutting II with the N. face of Cutting III, and clearly exposed the upper wall of the fosse. On the top of the solid chalk 'wall' in the NNE. corner of Cutting II a slight platform was observed. It was found on excavation to continue a little towards the N., but judging from (1) the apparent hollows in the turf-clad inner bank for some little distance round, and (2) the fact that modern sherds were found down to the solid chalk, it appeared evident that some rather recent digging had taken place here, perhaps for chalk, as in the much larger mutilation in the vallum opposite on the south.

Having re-excavated Cutting III to a considerable depth we felt bound to complete the N. portion of it to the bottom, which the fine weather permitted us to do. It soon became clear in digging this cutting that the fosse approaching the causeway from the W. not only maintained the great depth, but expanded considerably towards the point where it rounded off to form the causeway under what is now the high road into Avebury (see plan, pl. xxix).

The top margin of the fosse in Cutting III proved to be 52 ft. wide, and the whole of the filling to a depth of 5 ft. was removed. This produced no object of importance and consisted entirely of silt from the hedge and road, and a loamy tenacious material said by the local people to have been brought to this spot from the site of the 'New Bridge' across the Kennet stream on the Devizes road, a quarter of a mile SW. of our diggings, when it was built. It entailed much manual work to remove this 'dumped' material, but afterwards we came upon the same ancient deposits as occurred in Cuttings

I and II, making 'finds' of pottery (nos. 142 and 143, p. 140),¹ and obtaining a well-worn flint scraper (no. 140) at a depth of 9.5 ft. in the mixed silting, which is illustrated

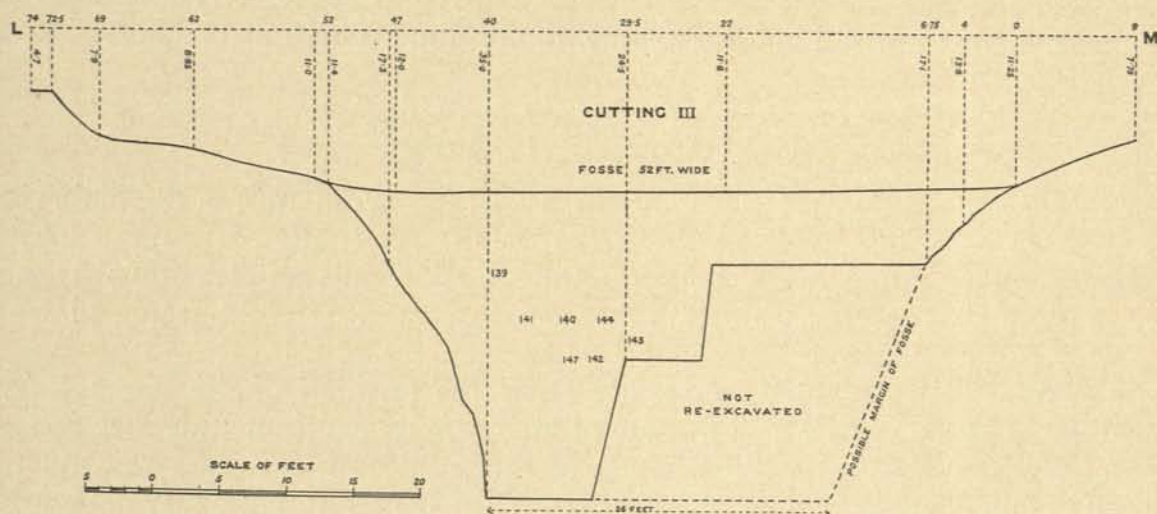


Fig. 1. Sectional diagram across Cutting III, Fosse, along the W. face of the digging and on the line L.M. of plan, pl. xxix.

in pl. XLVI. A flint core and another implement (nos. 147, 141) were found in the same deposit, down to a depth of 12.5 ft. (p. 144).

At length we reached the bottom at a depth of 23 ft. from the surface, but nothing of interest was found in the lowest depths, and no remains actually on the smooth floor of the fosse, which was exposed for a width of 8 ft. and a length of 3.8 ft. In no part of the excavations could one realize better the immensity of the great fosse and the labour its construction must have entailed when metals were practically unknown in Britain. The inner slope of Cutting III was perhaps the finest example of cut chalk exposed in any part of the excavations; and the uniformity of the slope and the absence of projections seemed to indicate that the fosse was originally excavated with greater care near the entrance-causeway than elsewhere. The average inclination of the fosse wall was at an angle of $63\frac{1}{2}^{\circ}$, and covered a length of 26.5 ft. on the slope (see fig. 1); but the steepness of the profile in the lowest 6 ft. was remarkable, being at an angle of 81° , the chalk resting in immense solid blocks in its natural condition. No ancient tool-marks were observable on the walls of the fosse, near the bottom or elsewhere.

VIII. CUTTING VIII, FOSSE

In many respects this fosse digging—the most westerly of our cuttings—was the most interesting. From it we were able to make various calculations as to 'structure', and the small 'finds' from here were among the most attractive.

Cutting VIII was 30 ft. long, and was afterwards extended in the middle 6 ft. farther W. in order that a ledge, or bench (length 10 ft.), might be cut, upon which the lower

¹ The sectional diagram (fig. 1) also shows the position of no. 139, part of a base of a medieval pot, depth 6 ft.; and no. 144, two small pieces of grey Roman pottery, depth 9.5 ft.

strata of silting could be thrown in clearing the bottom of the fosse. The E. margin of the cutting (in the middle of the silting) was 232 ft. in a direct line from the middle of the gateway on the roadside close to Cutting III (plan, pl. xxix), and 97.5 ft. from the middle of the W. margin of Cutting I across the fosse (see diagram, pl. xxxvi, fig. 2).

The surface of the silting at the point selected was fairly level (5 in. higher on the E. than on the W. margin). It has been stated, on the authority of the oldest inhabitants of Avebury, that the whole of the SW. quarter of the fosse had been cultivated as arable land some eighty-five years ago, and this would account for the flatness here (pl. xl, fig. 1).

The upper deposits of silting at the E. end consisted, from the top downwards, of (1) turf and turf-mould, (2) surface silting, (3) mixed silting, and (4) fine mixed silting, their thickness being, in the middle of the accumulation, 0.65, 3.35, 2.7, and 2 ft. respectively. This gave a total depth of silting above the chalk rubble of 8.7 ft. On the W. margin, where the fosse was shallower, these deposits were represented by a thickness of 7.7 ft. Dividing the surface silting from the mixed silting was a thin seam of small pieces of chalk which was traced nearly the whole way along the cutting. This feature is well seen in the photographs, pl. xxxix, figs. 1, 2.

In the mixed silting some Roman remains were found, including an 'Aucissa' fibula of bronze (no. 162), described and illustrated on pp. 155-7. At a depth of 4.7 ft. a small iron cleat, for shoe or sandal (no. 156), was found; it is 22 mm. in length, and has a narrow base (width 7.5 mm.) with the usual projecting points for attachment.¹ Scattered over a considerable area at a depth of 3.5 ft. part of a black earthenware saucer (no. 161) of shallow type was found; it has a bead rim.²

Part of a humerus and tibia, human, were found at a depth of 4.5 ft. (p. 148); and pieces of red- and roe-deer antler were collected (nos. 149, 164, 172, and 174, p. 154).

At a depth of 5.7 ft. a finely chipped flint knife (no. 154) was discovered, and is described on pp. 142, 144, and figured in pl. xlvi. The other flint implement was the scraper and awl (no. 166) (p. 144, and pl. xlvi).

In the mixed silting two distinct patches (not seams extending across the digging) of dark mould and very fine chalk were traced, the lower one practically throughout the length of the cutting at an average depth of about 7.2 ft. below the surface. The higher patch was at a depth of from 5.4 ft. to 6 ft., and extended northwards a couple of feet into the chalk rubble on the side. Each layer was 0.6 ft. in maximum thickness. Evidence of fire was distinctly traceable, and charcoal in small pieces was observed in both

¹ These cleats are of frequent occurrence in Romano-British deposits; their use as portion of the iron furniture of sandals, or shoe-leather, is proved by the discovery of specimens, with a quantity of hob-nails, at the feet of skeletons at Rotherley and Bokerly Dyke. A specimen was found on the old surface line under the rampart of Wansdyke, a few miles S. of Avebury (*Excavations in Cranborne Chase*, ii, 190; iii, 102, 106, 129, 270, &c.). Two specimens were discovered at Maumbury Rings (*Proc. Dor. Field Club*, xxxi, 244).

² Other finds of Roman and Romano-British pottery were as follows:

No. 152. Fragment of soft cream-coloured New Forest ware, painted black and slightly ornamented; depth 4.2 ft. near top of mixed silting.

No. 153. Fragment of brown pot; found in similar position to no. 152.

No. 155. Two fragments of light brown pottery; depth 4.3 ft.

No. 158. Fragment of brown pottery, with slight striations; depth 4.5 ft.

deposits. It is probable that these areas indicate occupation when the fosse had silted up to the respective levels.

In the lower patch we found a piece of the burr of a small red-deer antler, a piece of burnt bone, and fragmentary animal remains including those numbered 160, viz. part of the beam of a shed antler of red-deer, with burr, brow- and bez-tines complete; part of a dog's jaw, and a boar's tusk. The prehistoric pottery (no. 167) was found in the upper deposit of burnt material, in chalk rubble, depth 6 ft., associated with several bits of burnt bone and pieces of burnt iron pyrites. Seeing the importance of this ornamented pottery we had all the burnt material passed through a sieve. This pottery is of typical Neolithic B (Peterborough) type, and is described on p. 138, and illustrated in fig. 7.

The chalk rubble was found, as in the other cuttings, to cover the solid faces of the fosse (well seen in the photographs, pl. xxxix, figs. 1, 2, and pl. xxxiv, fig. 1), and its accumulation must have been very rapid when the ditch first fell into neglect. Relics found in this deposit would probably all belong to the first decade or so following the disuse of the monument.¹ This silting was no doubt the result of natural causes, i.e. the scaling of the profile of the fosse in frosty and rainy weather, and the slipping down of the loose rubble forming the vallum, which in all probability was not at that time turf-clad. Comparatively small quantities of turf and mould would, in the course of construction, be thrown up with the chalk to form the great vallum, and the occasional fall of the dark mould from the bank would be sufficient to account for the concave streaks, or seams, in the chalk rubble of the fosse, which were even better defined in this cutting than in the sections previously made (see photographs, pl. xxxix, figs. 1, 2). The lowest seam of mould met with, which extended right across the cutting in one part, reached at the point of greatest concavity to within 5 ft. of the bottom of the fosse. Four seams on the S. side of the silting were, for a length of several feet, exceptionally noticeable.² On the E. margin the depth of chalk rubble in the middle of the fosse was 10 ft. This rubble was somewhat larger at about 2.5 ft. from the bottom, especially in the middle of the ditch, but it became rather smaller again on the bottom. Pieces of iron pyrites were commonly found in the rubble, but very little flint was observed, and most of the pieces were very small. Fragments of charcoal were occasionally met with. At the top of this deposit the lumps of chalk were found cemented together—no doubt caused by means of carbonate of lime contained in water which had percolated through the upper silting. The thickness of this consolidation was perhaps hardly as great as in Cuttings I and II.

High up in the chalk rubble Neolithic B (Peterborough) ware was found in two places, see nos. 163 and 167 (mentioned above) in the sectional diagram on line O.N. of plan (pl. xl). This interesting pottery has been described by Mr. Stuart Piggott on p. 138, and is illustrated in fig. 7, p. 139. No pottery was found in this cutting at a lower level.

¹ When the whole profile of the fosse became covered by chalk rubble the remainder of the silting must have accumulated in a decidedly decreasing ratio. The upper stratified layers, which are of a sedimentary character and much finer than the chalk rubble below, must have been deposited by wind blowing material into the fosse, and also produced by rain.

² See similar seams of mould in the fosse of Wor Barrow, Handley, Dorset (*Excavations in Cranborne Chase*, iv, pl. 250, 251, which the writer drew for General Pitt-Rivers many years ago).



Fig. 1. View of Avebury, taken from the S., showing some of the remaining stones of the great outer circle and of the inner southern group; also the excavations on the site of the Entrance Causeway on the right, and in the foreground the silting of Cutting III, Fosse, being removed in 1909



Fig. 2. View, looking WNW., of the early stages in the excavation of Cutting IX, Fosse, on the E. side of the Entrance Causeway, a cutting across which is seen (22 April 1914)

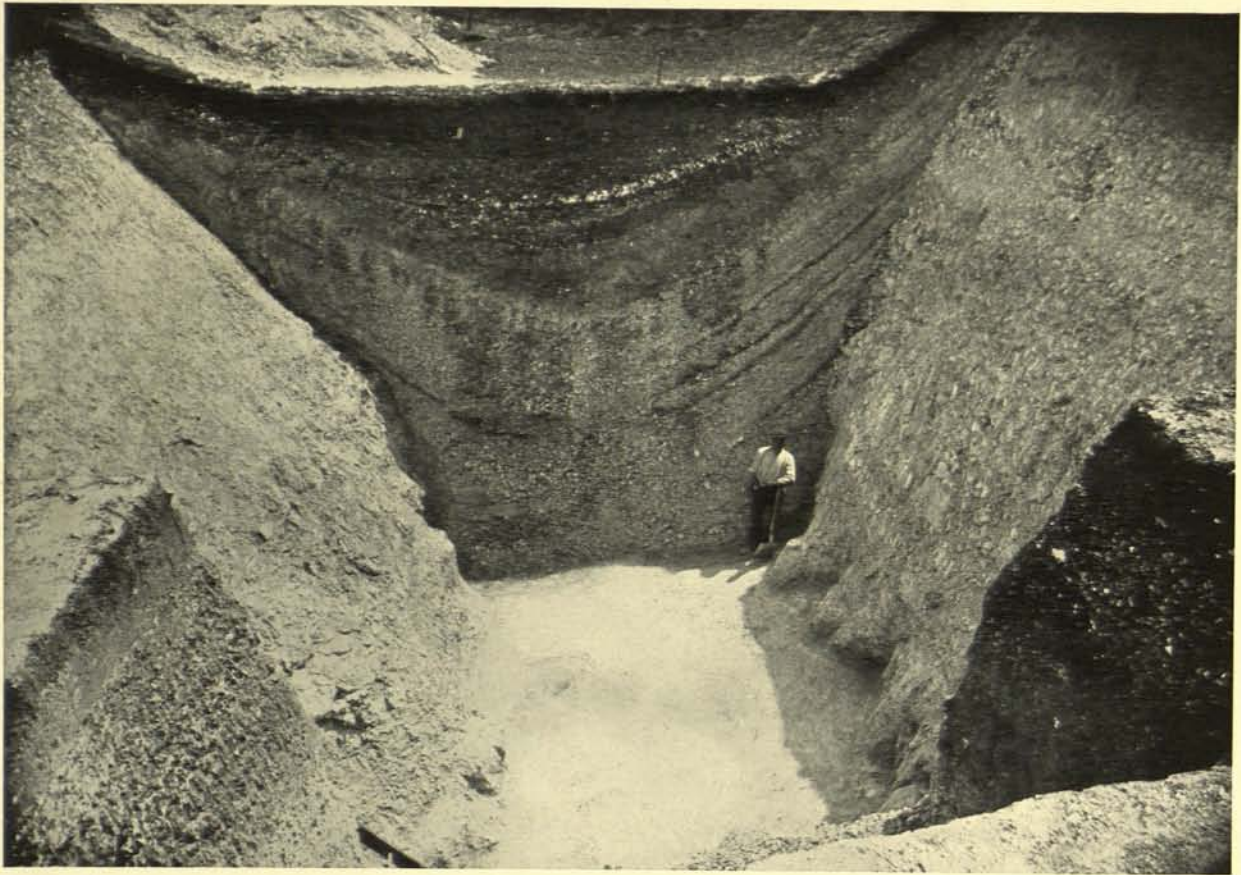


Fig. 1. The re-excavated Fosse, Cutting VIII, looking E., showing a length of 21 ft. of exposed floor (max. width 15 ft.), the solid chalk escarp and counterscarp of the Fosse, and the almost vertical face of silting
(11 May 1911)



Fig. 2. The same cutting showing at closer quarters the stratified layers of silting against which a 23-rung ladder rests. The minimum vertical height of the chalk rubble at the bottom is 10 ft.
(9 May 1911)

A flat and rounded disc of impure sandstone (no. 159), water-worn into pebble-form, was found in the rubble, depth 6.8 ft.; it shows signs of fire at one end apparently, but the flaking might be due to other causes. No flint implements were discovered in this part of the silting.

A shed antler of red-deer (no. 170), of medium size, was found on the floor of the fosse

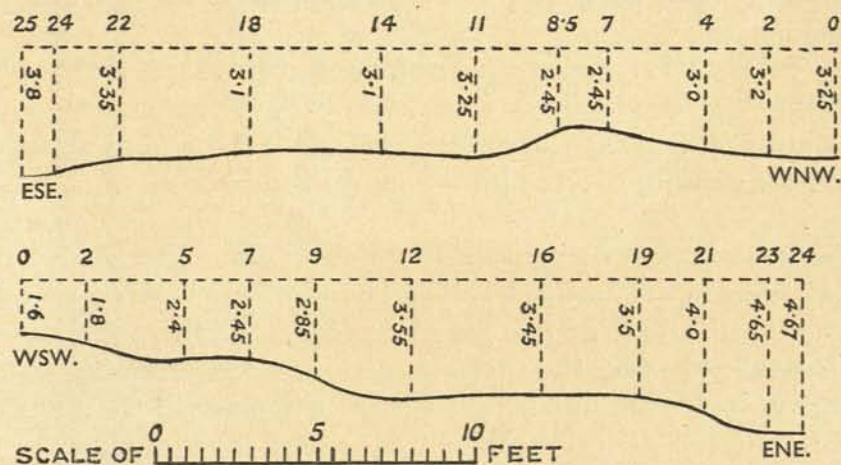


Fig. 2. Sections taken across the bottom of the Fosse, Cutting VIII, from ESE. to WNW. and from WSW. to ENE. The levels vary to the extent of 2.95 ft.

near the S. margin; the brow- and bez-tines were broken off; total length in direct line 22 in. Two antler picks, nos. 175 and 176, described on p. 151, were in the same deposit; the latter is figured in pls. XLVII and XLVIII. An excellent specimen of a rake, no. 172, consisting of the crown of an antler of red-deer, with three points or surroyals, bearing evidence of wear (pl. XLVIII) was also uncovered on the bottom of the fosse.

The greater part of a large rib-bone, probably of ox, with rough, slightly incised, longitudinal scoring, was taken from the bottom of the fosse.

An animal's rib-bone, no. 171, was found on the floor of the E. half of this cutting against the N. face. It has been worked to a rounded termination at one end, where it is very smooth—slightly bevelled from one side. Another, no. 176a, worked in a similar manner, but damaged at the 'business-end', was found on the bottom of the W. margin of the cutting. Both of them are illustrated in pl. XLVIII. Two similar worked rib-bones were found near the bottom of the fosse, Cutting IX (p. 127).

This cutting was 30 ft. long at the top, but as a considerable batter to the faces of the silting had to be left to avoid any risk of falls, it was only possible to uncover completely a length of 21.5 ft. of the floor. Unlike the floor in Cuttings I, II, and III, the bottom was found to be very irregular and far from level. Its maximum width was 15 ft. at the E. end, and the minimum width in the middle about 9.5 ft.

Two sectional diagrams of the floor were made (fig. 2), showing that the levels taken varied to the extent of 2.95 ft. This may probably be accounted for by the poor quality of the rock in this position, which consisted of a soft, smooth, rotten, pale greenish-grey chalk of the zone of *Rhynchonella Cuvieri*. The common fossil, *R. Cuvieri*, was found close to the floor. This poor chalk occurred also in the lowest part of the profile of the

fosse, with occasional solid blocks of whiter chalk projecting beyond it, as seen in the photographs, pl. xxxiv, fig. 1, and pl. xxxix, figs. 1, 2.

On the line of section O.N. (pl. xl, fig. 1) both the escarp and the counterscarp of the fosse, revealed by the removal of all the silting, had faces inclined at different angles. The following was the inclination of the chalk sides: *Escarp*, lower 5 ft., inclination, 90° ; middle 18 ft., 62° ; upper part, 28° ; *Counterscarp*, lower 8 ft., inclination 74° ; middle 12 ft., 50° ; upper part, 28° .

The fosse in Cutting VIII was deepest along the E. margin, viz. 18.7 ft. below the surface of the silting. It gradually rose as the work of re-excavation was continued westward. The depth of the fosse below the surface of the silting along the W. margin of the cutting was: maximum, 16.8 ft.; minimum (in the S. corner), 15.3 ft.; in the middle of the fosse, 16.3 ft.

While the excavations were in progress a sectional diagram (pl. xl, fig. 1) was plotted along the E. margin of Cutting VIII, and continued in a SSW. direction to include the crest of the vallum, the foot of the exterior slope, and the boundary-hedge beyond, and in a NNE. direction to cover the turf-clad counterscarp of the fosse and a small part of the central plateau, including one of the sarsen standing-stones (height 8.5 ft.) of the great outer circle.¹ The horizontal distance from the N. side of the stone to the N. upper margin of the boundary-hedge was 183 ft., and from the middle of the fosse to the crest of the vallum about 78 ft.

This section showed that the central plateau was 12 ft., and the crest of the vallum 31 ft. above the turf level of the fosse. After re-excavating the fosse the bottom was found to be 18.7 ft. deep below the surface of the silting on the E. margin, and consequently 49.7 ft. below the crest of the vallum. Supposing that the crest of the vallum was originally about 5 ft. higher, the total vertical height from the floor of the fosse to the summit of the embankment would not have been less than 55 ft.

Along the line of section on the E. margin of the cutting a narrow trench (3 ft. wide) was dug from the S. side towards the crest of the vallum, to ascertain the position of the hewn chalk. It was found to run at an angle of 28° for a considerable distance, at a depth of from 1.1 to 1.6 ft. below the surface of the turf. This digging was carried far enough (20 ft.) to find clear traces of the old turf-line under the great vallum, and to reach the solid chalk at a depth of about 2.2 ft. below its surface. From this trench and the level of the central plateau, we were able to obtain a fairly accurate estimate of the *original* depth of the fosse in this part, that is its depth below the ground level at the time of the construction of Avebury. This estimate gives the depth of 31.5 ft. for the fosse in the middle, and a height (measured from the same point) of about 18.2 ft. for the vallum above the old surface line at the present time; but the original height of the embankment, as previously suggested, was no doubt greater.

¹ Between this stone and the field-fence to the SW. a small excavation was made to test the depth of the solid chalk, which was found to be 1.95 ft. below the field-level. The material above it was surface mould 0.75 ft.; the rest, mixed rubble.

FIG.1. SECTION ON LINE O.N. OF PLAN.

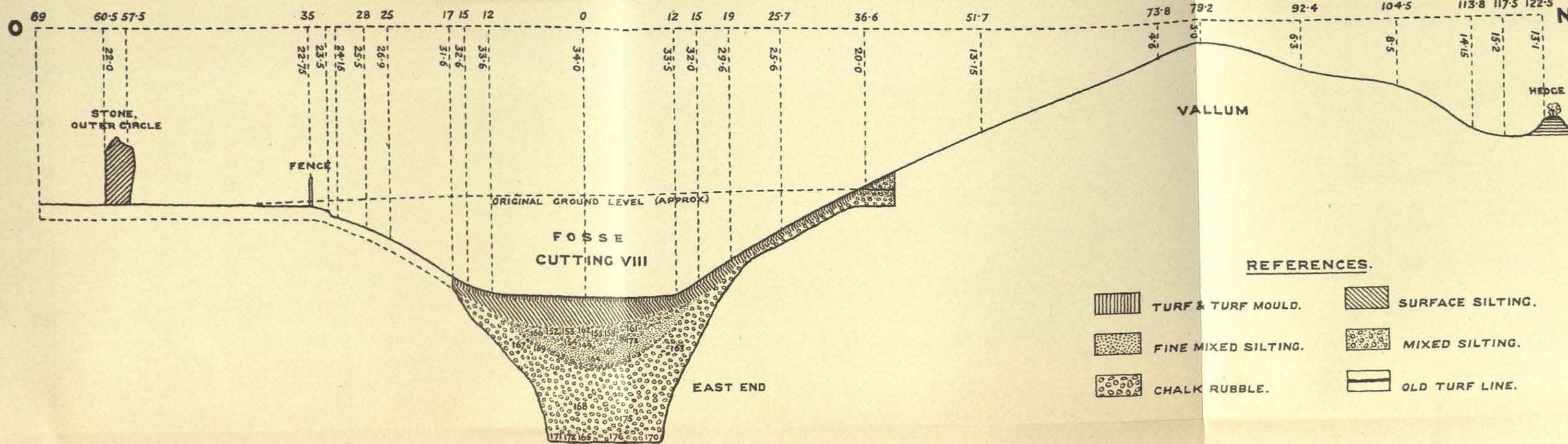


FIG.2. SECTION ON LINE AA.BB. OF PLAN.

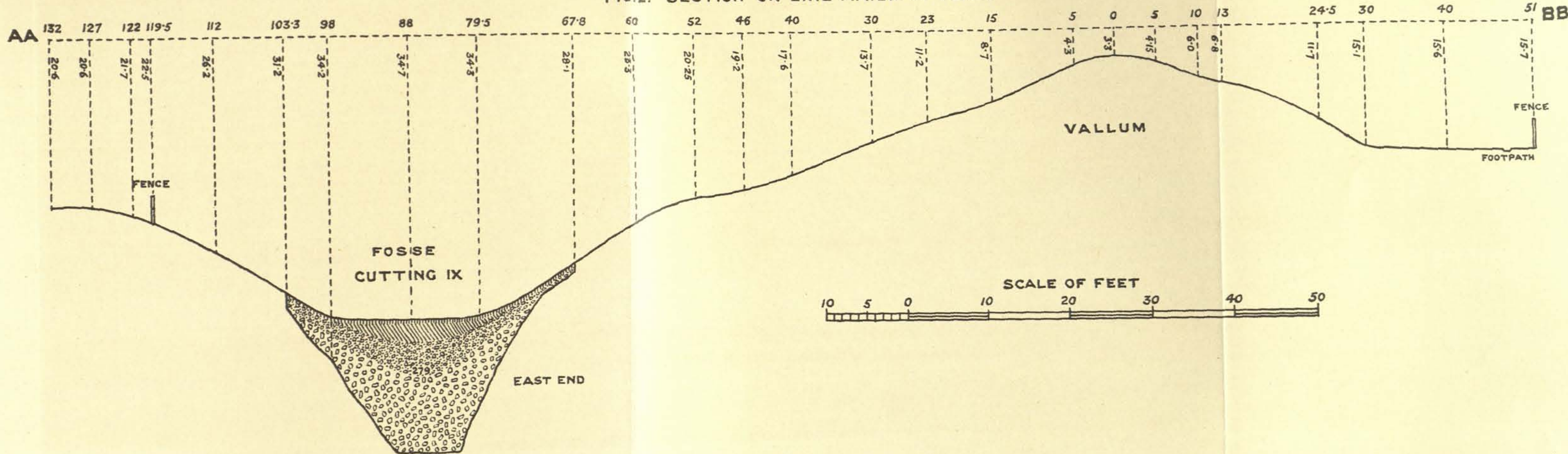
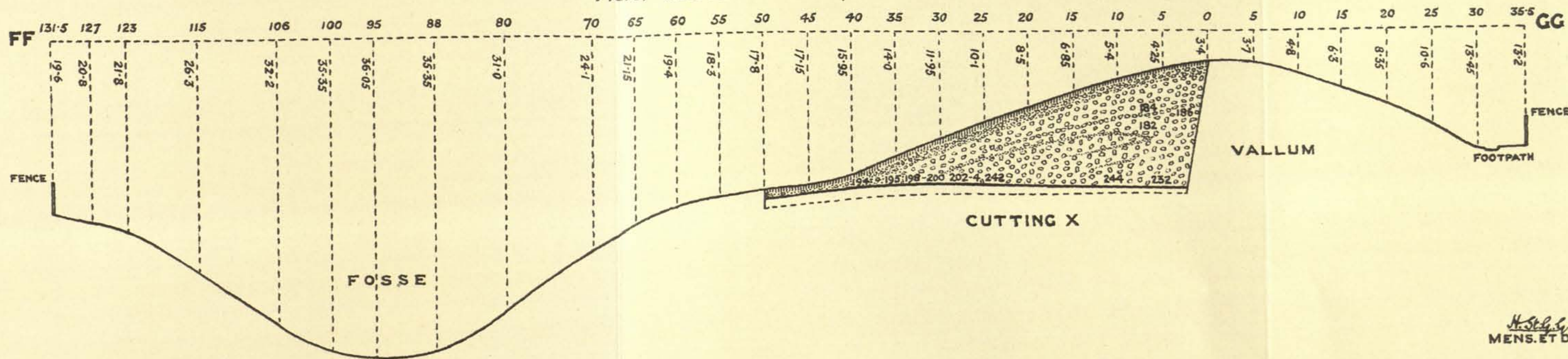


FIG.3. SECTION ON LINE FF.GG. OF PLAN.



SECTIONS OF THE FOSSE AND VALLUM, AVEBURY

IX. CUTTING IX, FOSSE

This cutting was begun in 1914 and completed in 1922—the Great War having caused a long cessation of activities at Avebury.

The fosse excavation marked out for examination measured 44.5 ft. in length, and was situated on the E. side and against the solid chalk causeway (see plans, pl. xxix and pl. xliii, fig. 3). The width of the cutting was regulated by the line taken by the escarp and counterscarp of the fosse.

The crest of the vallum in the position of the E. end of Cutting IX is about 31.5 ft. higher than the surface of the silting of the fosse, and the latter is 14 ft. below the central area (outer circle). There is a decided berm¹ between the fosse and vallum in the position of Cutting IX (see sectional diagram on line AA.BB. of plan, pl. xl, fig. 2).

This part of the ditch, being near the road, had been used as a receptacle for all manner of rubbish and pots and pans, all of which had in the first place to be cleared, together with the stumps of many bushes.²

The first week was devoted to the removal of comparatively recent silting at the end of the fosse and along the E. margin of the causeway down to a depth of 6.5 ft., that is to the level of the surface of the silting at the E. end of the cutting (pl. xlv, fig. 2). On the completion of this work the true and enormous dimensions of the upper margin of the fosse and its termination against the side of the causeway were revealed.

From the summit of the ancient causeway (E. margin) to the brink of the true fosse—a distance of about 20 ft.—the solid chalk was found to fall gradually, with slight ledges cut at intervals. From the brink, the solid chalk profile of the fosse—in other words the E. face of the causeway—dipped downwards at an angle of 61°, its upper margin being nearly straight (and square with the line of the fosse), with a slight concavity towards the west (see plan, pl. xliii, fig. 3). Following the brink of the fosse in this part it was found that its upper margin had a maximum width of 45 ft.

In re-excavating the successive strata the same arrangement of concave seams of silting were met with as in the fosse Cuttings I, II, III, and VIII. Almost needless to say, there was found to be a greater depth of mould and mixed silting at the W. end than at the E. end of the cutting.

After an infinite amount of labour a length of 4.25 ft. of the original floor of the fosse, at the W. end and against the face of the causeway (pl. xli, fig. 1), was uncovered at the enormous depth of 30.25 ft. below the brink of the fosse, vertically measured, that is 35.75 ft. below the top of the ancient causeway, and approximately 55.5 ft. below the

¹ This berm was noticed by the Rev. A. C. Smith in *Guide to the Antiquities of the North Wiltshire Downs*, 1884: 'The rampart for a considerable portion of its circuit shows an apparent terrace or "berme" half-way up its side, though this is in reality only the original level of the ground upon which the excavated earth from the fosse was thrown up.'

² With the owner's permission, four young trees of some fifteen years' growth were removed from this position and transplanted. Afterwards in the removal of the silting, even at considerable depths, the work was much impeded not only by the roots of the bushes and young trees, but also by those of many of the larger trees growing on the causeway.

present crest of the vallum. Even with these dimensions it is difficult to realize the magnitude of this part of the fosse without having visited the excavations.

The bottom of the fosse in the part already uncovered in 1914 was found to be fairly level, the width on the line of the causeway being 14 ft. The lower 7 ft. of the end-wall was inclined at an angle of about 71° . The greater part of the solid chalk end of the fosse appeared to be squared off with the sides of the fosse, and not rounded off. The face of the solid chalk was excellently cut.

In the NW. and SW. corners of the re-excavated fosse were two very shallow open channels, or 'shutes', which appeared to be artificial, and cut for a special purpose in the chalk wall. They may be due to an unsuccessful attempt to square or round the corners uniformly; on the other hand, these recesses might have been caused by wear in hauling up baskets of loosened chalk by means of ropes in the original formation of the fosse. The channel on the NW. extended from top to bottom of the fosse (tailing out at the bottom).¹ That on the SW. stopped about 12 ft. below the brink of the fosse, and was crossed by two or three slight ledges in the lower half.

This completes all that need be said about the dimensions and filling of the fosse ascertained in 1914. We will now turn to the work of 1922, and finally describe the specimens found in this great cutting independently of the year of discovery.

On resuming the work in 1922 (pl. xxxviii, fig. 2) it was our first intention to measure the amount of talus which had formed in the partly re-excavated fosse during the eight years which had elapsed since 1914.² The talus *appeared* to be very considerable, and in the middle of the cutting its surface was only 13 ft. below the surface of the silting of 1914, and about 12 ft. above the floor of the fosse, as shown by a curved dotted line in the section, pl. xliii, fig. 1. Nearly two-thirds of the end-wall forming the causeway had become covered by loose material, mostly chalk.³

But the value of these calculations was greatly lessened when, on clearing out this part of the fosse again and instituting inquiries in the village to supplement what was obvious to the eye, it was found that several tons of rubbish, tins, crockery, and bottles, as well as some stone, had, at intervals during the eight years, been shot into this hole, which apparently formed an attraction to those in this village and elsewhere who had rubbish to dispose of!

The lower layers of the silting were removed in such a way that the material passed through three or four hands, thereby lessening the chance of missing pottery, flints, bone,

¹ Seen, but not well seen, in photograph, pl. xli, fig. 2.

² In that year we had exposed a length of only 4.25 ft. of the original floor of the fosse, and for a length of another 5 or 6 ft. the re-excavation had reached to within 2 or 3 ft. of the bottom.

³ In 1893 General Pitt-Rivers excavated Wor Barrow, Handley, Dorset, and the ditch which surrounded it, which proved to be 13.5 ft. deep (maximum). The latter was left open for four years, so that a calculation might be made of the amount of denudation and silting that would take place during that short period. The writer of this paper made three sectional diagrams for this purpose (see *Excavations in Cranborne Chase*, iv, 24), and it will be observed that in the middle of the lower part of the ditch a depth of 2.5 ft. of chalk rubble had accumulated, and that at the sides the rubble had covered the solid chalk profile for a distance of 8 ft. from the bottom upwards, leaving 6 ft. or more of the 'wall' exposed to the erosive force of the atmosphere, which had caused the ditch at the top to widen to the extent of about 1.5 ft. on each side.



Fig. 1. The end walls of Cutting IX where the Fosse terminates against the Entrance Causeway. Shallow water marks the position of the bottom. At this stage the excavations of 1914 terminated (5 May 1914)



Fig. 2. General view, looking NW., of the re-excavated Fosse, Cutting IX, which illustrates its enormous depth in this part (maximum 30·25 ft.). The levelling-rod stands at 10 ft. (22 April 1922)



Fig. 1. View, looking SSE., of the two Sarsens of the great outer circle on either side of the Entrance into Avebury by way of the Causeway revealed in excavations which are seen in the photograph (1909)



Fig. 2. View of Cutting X through the Avebury Vallum, looking SSW., in which the old turf line is well seen
(4 May 1914)

and other remains mixed with the silting. 'Finds', however, of small kinds were few, and were it not for the antler picks, etc., the number of relics would be decidedly small.

On removing the silting at the E. end where the cutting was 35.5 ft. wide, the chalk rubble in the middle was reached at a depth of 7 ft., but owing to the curvature of the stratified layers the chalk rubble on the sides extended almost to the top. This concavity in the layers was extremely well seen on the E. face of this cutting just before the completion of the digging and during the final stages in clearing up the floor. It was intended to photograph this interesting feature on the last day of the work. However, owing to wind, hail, and rain, this loose and very moist face of silting would not stand, and a few tons of the material crashed to the bottom of the fosse, smashing our longest ladder in the fall. This disaster was much to be regretted, as this 'face' showed very remarkably the strata representing the long periods of time during which the silting had formed. An excellent photograph of the same 'face' was taken at an earlier stage of the work, showing the manner in which the silting was being removed (pl. XLV, fig. 2).

The upper 2.75 ft. of silting consisted of mould containing modern and medieval remains. Roman objects extended down to a maximum depth of 3.8 ft. Everything below that (in the middle) was of prehistoric date.¹

In clearing the bottom of the fosse it was found that the chalk rubble in the middle and near the causeway was very large, some pieces measuring 0.75 ft. across. At the sides of the fosse, as would be expected, the rubble was much smaller.²

In 1914 what little of the bottom of the fosse was exposed appeared to be fairly level, covering a width of 14 ft. But later it was found that at 5.5 ft. from the end-wall there was an abrupt rise of a foot; and, as the sectional diagram (fig. 3) shows, taken along the middle of the fosse, the floor continued to rise up to the limit of our digging eastward; it would have been interesting, had time permitted, to continue the re-excavation of the silting still farther eastward, if only to ascertain what variation took place in the relative depth of the floor of the fosse. In the length we were able to expose, viz. 25.5 ft., the floor rose from W. to E. to the extent of 7.55 ft., and at the E. end the bottom had diminished in width to 8 ft. Along the N. side of the floor, in the middle 9.5 ft.,³ there was a decided concavity suggesting a rough pathway.⁴ At from 8 ft. to 13.5 ft. from the W. end (fig. 3) there was, on the N. side, a natural vertical and smooth face of solid chalk reaching to a maximum height of 3 ft.

¹ At distances of between 6 ft. and 10 ft. from the E. end of the cutting several pieces of sarsen stone were found at depths varying from 5 ft. to 5.6 ft. They measured from 0.5 ft. to 0.75 ft. across, and were apparently not arranged in any special order. Much fewer and smaller fragments were found between 3.5 ft. and 5 ft. in depth.

² In the lower chalk rubble we met with occasional seams of fine mixed silting much compressed and difficult to break up. There were more seams, or patches, of mould in the chalk rubble in this cutting than in the others, and small pieces of ochreous clay were occasionally met with.

³ The 9.5 feet extended eastwards from a point 6 ft. E. of the W. end of the section, fig. 3.

⁴ If a large amount of the chalk excavated in the construction of the fosse was, in this part, brought to the NW. and SW. corners of the fosse (p. 124), this would probably account to a large extent for the worn depression or 'pathway'.

It remains to describe the chief 'finds' made in Cutting IX.¹

From the Roman stratum a number of pieces of Romano-British pottery was collected (nos. 192, 193, 256, 270) from an average depth of 3.45 ft.; also a whetstone consisting

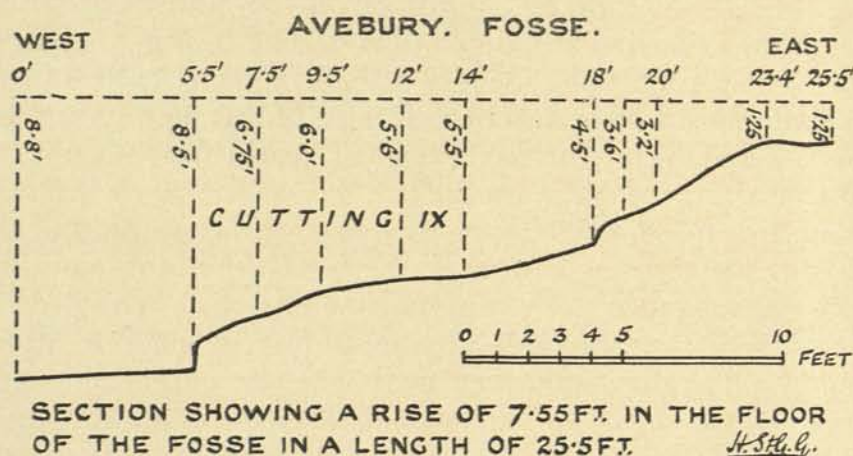


Fig. 3.

of an oblong piece of reddish-brown sandstone, very smooth on one surface and artificially grooved obliquely.

In bronze, a ring (no. 180), having an external diameter varying from 19.5 mm. to 20.5 mm., was found; and another (no. 269), having an external diameter of 20 mm., came from a depth of 3.8 ft. But the most interesting specimen in bronze was the greater part of a bracelet (no. 205) of bright green colour, consisting of two strands of wire twisted, which appears to have had a hook-and-eye fastening. It was found at a depth of 4.25 ft.

From the mixed silting a flint flake with secondary chipping (no. 189) was found, and a very interesting small flint knife (no. 177), plano-convex in cross-section, at a depth of 5 ft. It is figured in pl. XLVI, and described on pp. 142, 144. Two scrapers (nos. 257, 258) were also obtained from this deposit; no. 257 is shown in pl. XLVI.

From this area a few fragments of prehistoric pottery were collected (nos. 210, 231, 252, 279). No. 210 is described on pp. 136, 140, and one piece is illustrated in fig. 7. Nos. 231 and 252 are described on p. 140, and the latter illustrated in fig. 6. No. 279 is of exceptional interest, consisting of the only fragments of beaker found in the excavations. Four of the sherds were examined and drawn by Mr. Piggott (fig. 7, and pp. 136, 138), but several other small fragments were collected at the same place, scattered over an area of burnt earth measuring 1.25 ft. across, depth 6.5 ft., and at the bottom of the mixed silting, and barely 0.5 ft. above the top of the chalk rubble.

Parts of red-deer antlers (nos. 183, 188, 215, 216, 247) were found in this deposit.

Thirty picks of red-deer antler were collected from the chalk rubble, eight of which were found lying on the bottom, and the majority of the others close to the floor (see

¹ The human remains are described separately (see pp. 145-8). The position of most of the numbered 'finds' is shown in the plan, pl. XLIII, fig. 3.

pp. 151-3; several are figured in pls. XLVII, XLVIII). Five crowns of antlers, mostly used as rakes, were found on or close to the bottom of Cutting IX.¹

Two animal's rib-bones, nos. 223 and 225, were found near the floor of the cutting at depths of 24.5 ft. and 25 ft. respectively. The former measures 335 mm. (13¼ in.) in length on the outer curve; it is cut to a rounded and somewhat bevelled termination at the larger end, and the surfaces are rather smoother in this part than elsewhere; here the cancellous tissue is exposed. What remains of no. 225 measures 221 mm. (8⅝ in.) in length, but it is obviously broken at the butt-end; the cancellous tissue is exposed owing to shaping; it is cut to a rounded termination at the complete end, and is more pointed than nos. 171 and 223. These implements are figured together in pl. XLVIII. No. 225 is exhibited in the British Museum. Two similar implements, nos. 171 and 176a, were found at the bottom of the fosse, Cutting VIII (p. 121).²

A small slender animal-bone (no. 240), broken off at both ends, but quite smooth, is probably the shaft of a pin (length 44 mm.). It was found on the bottom of the fosse at the W. end.

X. EXCAVATIONS IN THE POSITION OF THE ANCIENT SOUTHERN ENTRANCE

Plans, pl. XXIX, and pl. XLIII, fig. 3; photographs, pl. XLII, fig. 1, and pl. XLV, fig. 1; and sectional diagrams, pl. XLIII, fig. 2, and fig. 4, p. 129.

Cutting III into the fosse having given no evidence of the position or existence of a southern entrance into Avebury, it was found necessary to pay attention to the area to the east, on the other side of the high road,³ both near the two large standing-stones of the outer circle on the property of Lord Avebury and in the position of the plantation of beech trees then owned by Lt.-Col. L. C. D. Jenner, the two properties being divided here by a barbed wire fence. The trees were noticed to be planted on a slight ridge so near the road that it was thought possible that it might be the result of a collection of rubbish from the highway and elsewhere, and especially as the position is covered on the south by the end of the outer vallum which appeared to obstruct any direct approach to the most northern remaining stone of the Kennet Avenue. But it was, on closer examination, observed that the slight ridge also extended towards the north into the

¹ Several fragments of red-deer antler were found at the bottom of the fosse cuttings. Fifteen fragments of antlers of red-deer were found at the bottom of the ditch of the long barrow known as Wor Barrow, Handley Down, Dorset, among late Neolithic remains (*Excavations in Cranborne Chase*, iv, 133).

² Somewhat similar worked rib-bones were found at All Cannings Cross, see Mrs. Cunnington's book on that site, pl. 10, figs. 3-5. Worked rib-bones, apparently of a different type, were found at Woodhenge (*Woodhenge*, pl. 21, figs. 1, 2).

Two spatula-like implements (B 48, 49) made from the rib-bones of ox, with one end worn in each case, lengths 175 mm. and 200 mm. respectively, were found in the Highfield pit-dwellings, Fisherton, Salisbury (*Wilts. Arch. Mag.* xlv, 612).

³ The roadway from the middle of hedge to hedge measured 33.5 ft. in width; the hard road measured 20 ft. wide. This road is nearly 3 ft. lower than the surface of the ancient causeway. In each of the sectional diagrams the position of the present road and the hedge and fence is shown. The digging in these cuttings (nos. IV, V, VI, VII) was carried down to the solid chalk.

meadow in the direction of the space (24 ft.) which exists between the two remaining standing-stones of the outer circle.

Cutting IV.—Forthwith a cutting, No. IV, was made, length 47 ft., width 5 ft., approximately at right angles to the ridge and 23 ft. from the most westerly of the standing-stones. Here the solid chalk in the middle of the cutting was reached at a depth of 2 ft. from the turf, and there appeared to be no sign of a continuation of the fosse in this position. The same depth was maintained to the most easterly part of the cutting, but there were occasional dips in the chalk which appeared to have no special significance. At 28 ft. from the eastern end there was a step in the solid chalk down to a depth of 3 ft. from the surface; at 33.5 ft. another step to a depth of 4 ft. from the surface; then a level floor for about 5.5 ft., followed by a gradual slope downwards to a depth of 4.5 ft. Having almost reached the hedge it was impossible to go farther. The causeway had been struck, and what appeared to be steps down to the brink of the ancient fosse at its termination on the west of the entrance had also been revealed.

A large number of sherds, glazed and unglazed, were found between the turf and a depth of 18 in. in the middle parts of the cutting; all of which appeared to be medieval and later ware. In the deeper part on the west a few pieces of brown pottery, apparently medieval, were found in or on a distinctly blackish-brown seam of mould, the result probably of disturbance at such a time as the modern bank and hedge were made. See plan, pl. xxix, photograph, pl. xlv, fig. 1, and section, fig. 4, p. 129.

Cutting V.—The next cutting made was close to the fence on the Jenner property. The western half was cut 5 ft. wide, the eastern 3 ft. It was begun close to the road-fencing, and continued in an easterly direction for a distance of 54 ft. At 25 ft. from the eastern end the solid chalk was reached at a depth of 1.35 ft. from the surface—the level of the ancient causeway. From this point eastwards the surface of the ground sloped towards the eastern fosse; likewise the solid chalk sloped downwards gradually, not evenly, but in rough, shallow and slight steps. At 50 ft. from the western end of the cutting the solid chalk shot down suddenly at an angle of about 46°, at which point the brink of the eastern fosse was undoubtedly reached. The western end is more difficult to describe, because a modern drain-pipe was met with, for draining the surface-water from the modern road into the eastern fosse, the placing of which had destroyed the contour of the solid chalk as left by the constructors of the causeway. See plans, pl. xxix, and pl. xliii, fig. 3, and section, fig. 4, p. 129.

Cutting VI.—Another cutting (length 56 ft., width 2.5 ft.) was made close to and parallel to the barbed-wire fence, and on Lord Avebury's property. This revealed the solid chalk running nearly level for a length of 25 ft., the nearest part of the surface of the turf being at a depth of 1.6 ft. At 19.5 ft. from the west end of the cutting the solid chalk dropped in two steps towards the western fosse, in the same manner as described in Cutting IV. At the E. end of the cutting the chalk sloped off very gradually. See plans, pl. xxix, pl. xliii, fig. 3, and section, fig. 4, p. 129.

Cutting VII.—This narrow cutting was dug among the beech trees on the Jenner property. The length examined was 50 ft., but a part in the middle had to be left untouched on account of the large roots of trees. This cutting gave clear evidence that the causeway was 24 ft. wide at the top in this part, and at a minimum depth of 1.8 ft.

FIG.1. SECTION ON LINE DD.EE.OF PLAN BELOW.

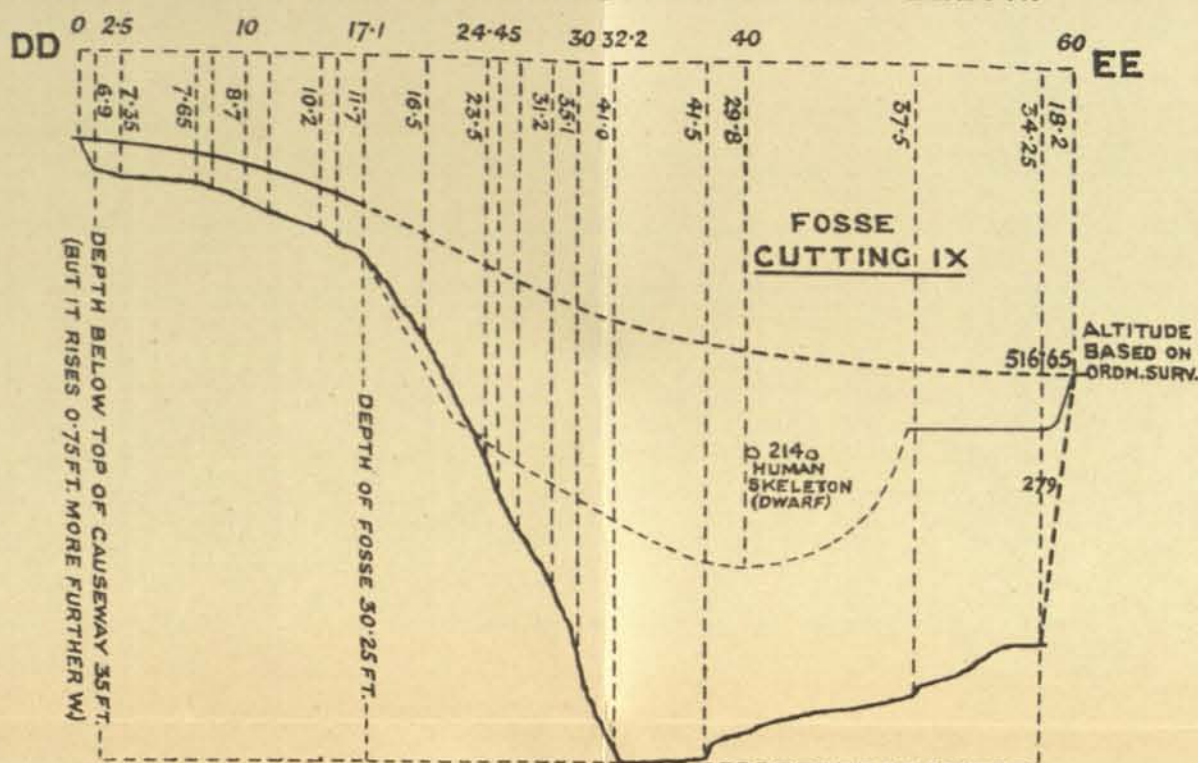
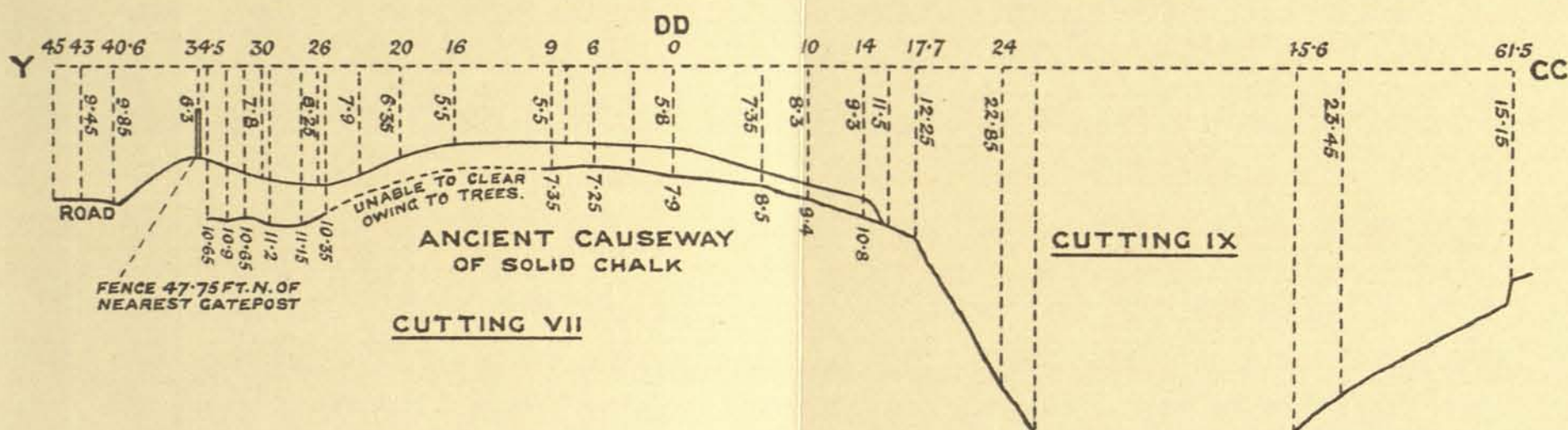


FIG.2. SECTION ON LINE Y.DD.CC.OF PLAN BELOW.



H. St. John
MENS. ET DEL.

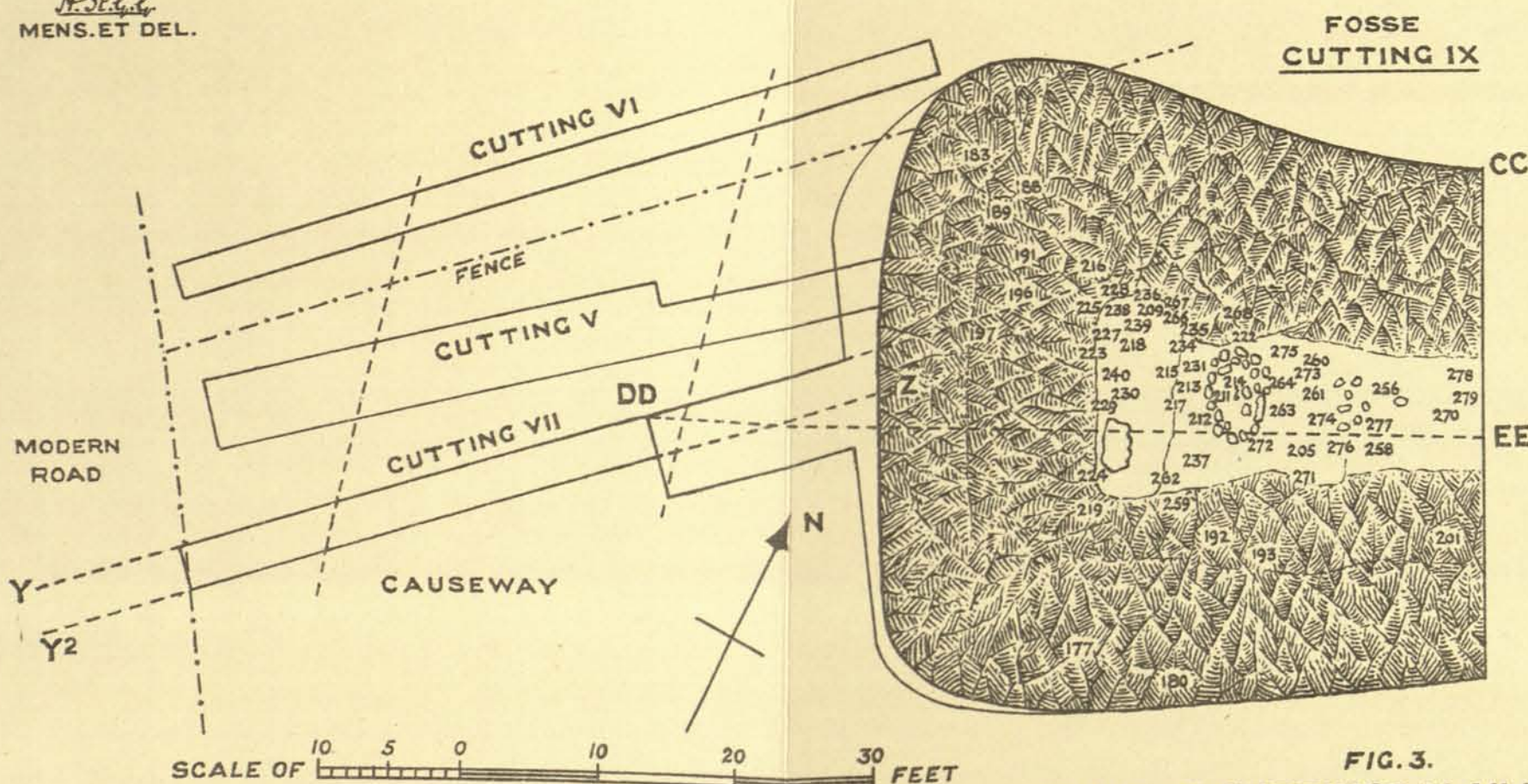


FIG.3.
PLAN OF CUTTINGS V, VI, VII AND IX.

Plan and Sections of Entrance Causeway and Fosse on the SSE. side of Avebury

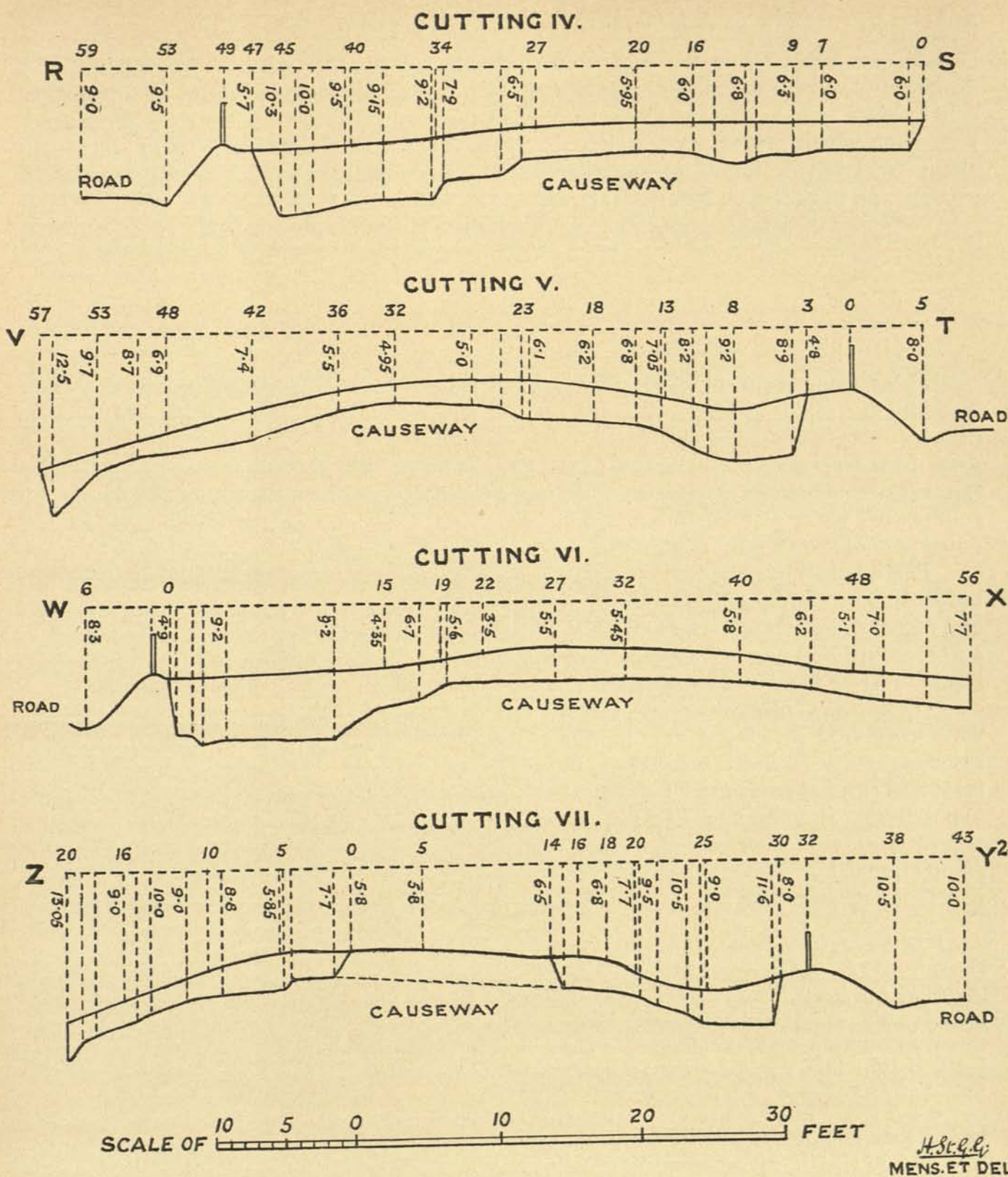


Fig. 4. Sectional diagrams of Cuttings IV, V, VI, VII across the Southern Causeway (Entrance) of Avebury.
The letters R.S., T.V., W.X., and Y².Z. are shown on the plan, pl. xxix, and Y².Z. on the plan, pl. XLIII, fig. 3, also.
VOL. LXXXIV.

from the surface. From the margins of this ancient road of solid chalk, rough steps downwards were traced in both directions. In the eastern half the brink of the fosse was reached at a distance of about 14 ft. from the eastern margin of the top of the causeway, from which point the solid chalk had been cut abruptly downwards at an angle of about 51° , into the depths of the fosse below. See plans, pl. xxix, pl. xliii, fig. 3, and sections, pl. xliii, fig. 2, and fig. 4, p. 129.

No relics of datable importance were found in any of these cuttings.

XI. CUTTING X, VALLUM

See plan, pl. xxix, sectional diagram, pl. xl, fig. 3; and photograph, pl. xlii, fig. 2.

This cutting, 15 ft. in width, was made on the SSE. and within easy distance of the fosse-digging (Cutting IX), so that the two excavations could be watched simultaneously in 1914. At this point the vertical height from the surface of the silting of the fosse to the crest of the vallum was 32.65 ft., and from the middle of the berm to the top, 14.4 ft. About one-half of the berm was included in the excavation which extended southwards as far as the summit of the vallum, the length examined being 50 ft. The outer part of the vallum, comprising a length of 30 ft., remains to be excavated.

The whole of the body of the rampart was found to consist of chalk-rubble with a little admixture of mould in the form of seams. The old turf, or old surface line (*humus*), and the dark brown material immediately below it were found to be very clearly defined, and measured on an average 3.5 in. in thickness throughout the cutting. It ran fairly level, and was reached at a depth of 14 ft. below the crest of the vallum.

Upon this ancient material—the old turf line—the late Mr. Clement Reid, F.R.S., who examined a dried lump, kindly reported as follows: 'Brown silty clay, with small splinters of flint and minute fragments of charcoal. The matrix is mainly an insoluble residue from the Chalk, with the usual dark stain of mixed oxides of iron and manganese. It contains also some very fine quartz-sand, probably derived from Tertiary deposits. It is scarcely a soil, though it shows small roots; it is a subsoil into which some charcoal has been kneaded. It corresponds with the "clay-with-flints".'¹ The charcoal was found by Mr. J. Cecil Maby to be hazel, hawthorn, and horse-chestnut.

¹ In connexion with this subject it might be well to mention here that Dean Merewether in his account of *The Examination of Silbury Hill* (Archaeol. Inst., Salisbury vol., 1849, p. 76; Smith, *Antiquities of North Wilts.*, 152) said that 'the thin compressed line of clay, formerly grass, could be traced continuously throughout the tunnel'.

When the mound in the grounds of Marlborough College was examined it was found that over the charcoal on the original surface a thin stratum, $\frac{1}{2}$ -inch, of reddish clay extended (*Report Marlborough Coll. Nat. Hist. Society*, vol. lxi for 1912).

It was found in excavating the Cuckhamsley Barrow in Berks in 1843-4 that 'over the turfy base is a stratum of stiff ochreous clay of a ferruginous nature, which must have been procured at some distant spot'. This barrow was 21 ft. in height, but formerly is believed to have stood much higher (Hewett, *Hundred of Compton, Berks.*, art. Cuckhamsley).

Objects found in the Vallum, Cutting X

Fortunately a favourable position was chosen for this cutting, and a number of relics were discovered on the ancient surface and elsewhere.¹ Several of the fragments of prehistoric pottery, mostly very small, were recovered from the old surface by breaking the hard mould up in the hands and sifting. Flint flakes were plentiful (p. 145).

The flint implements have been described on p. 141 and in the table on p. 144.² Nos. 199, 200, 206, 221 are figured in pl. XLVI.

The prehistoric pottery, mostly small fragments, are elsewhere described (p. 140), and they include at least three 'finds' of Peterborough ware. Nos. 220, 244 are illustrated in fig. 6.

The two antler picks found in the vallum and other fragments of antler are described elsewhere (pp. 154, 155).

In bone there were the following numbered specimens:

No. 182. Small, flat piece, length 33.7 mm., rounded at the complete end, and of similar workmanship to the larger worked rib-bones, nos. 223 and 225, found at the bottom of the fosse.

Found in the body of the vallum, depth 6 ft.

No. 186. Finely worked pin, very slightly curved, with faintly tooled and polished surface; length 86 mm. ($3\frac{3}{8}$ in.), the shaft of oblong section, maximum dimensions 2.5 mm. by 4.5 mm. One end is finely worked to a sharp point of round section; the other end is cut off slightly oblique to the line of the pin, and is bevelled on both the flat faces of the implement. Both faces are figured in pl. XLVI.

Found in chalk rubble in the body of the vallum, 8 ft. N. of the crest, depth 5.5 ft.

XII. EXCAVATION ROUND A PROSTRATE STONE

Plan and sections, fig. 5; photograph, pl. XXXII, fig. 1.

The fallen stone chosen for examination in 1909 is one of a group of five (two standing, three prostrate) forming the south and south-west portion of the southern of the two groups of inner circles. It is the most southern of the remaining prostrate stones of this circle (see plan, pl. XXIX), and is situated at a distance of 144 ft. to the north of the most western of the two large standing-stones of the outer circle at the entrance. Before excavation the stone was seen to have fallen in a southerly direction, the north end being considerably covered by turf. The digging was carried down to the solid chalk on all sides except the south and south-west.

This digging proved (1) that the stone measured $16\frac{1}{4}$ ft. long by 12 ft. wide; (2) that

¹ A fourpenny-bit of William IV, 1836, was found near the foot of the interior slope of the vallum in the turf mould, depth 0.4 ft.

² Photographs of flint saw, scraper, and chisel-end arrowhead found on the old turf line under the vallum of Avebury during excavations made many years ago were given by Mr. A. D. Passmore to Devizes Museum (*Wilts. Arch. Mag.*, xliii, 385).

it had fallen in or since medieval times; (3) that a socket-hole had been cut into the solid chalk to a depth of 1.5 ft., roughly shaped to receive the base of the stone; (4) that for additional support the stone had been packed round with a considerable number of blocks of sarsen measuring from 4 in. to 16 in. across; (5) that the base of the stone had been set at a depth of 4.3 ft. from the present surface of the ground; and (6) that the base of the stone in its fall had kicked out in a northerly direction to the extent of only 2 ft.

A number of sherds were found in this excavation, but nothing apparently was of earlier date than Norman times. Between the surface and a depth of 2.5 ft. and above the level of the socket-hole cut into the solid chalk, this medieval pottery appeared to be plentiful enough to indicate the former existence of some kind of a dwelling close against the stone, and it is possible that shelter, for a number of years together, may have been taken in close proximity to these huge standing-stones. Some of the pottery was found under the north end of this prostrate stone; it was, however, observed that the sherds were close against the stone, and none below the level of the natural bed of solid chalk.

A plan and two sectional diagrams were made of this excavation, see fig. 5.

XIII. THE AVEBURY DITCH: THE MOAT THEORY

Having found the floor of the great fosse so irregular in places, especially in Cuttings VIII and IX, and having more than once heard the suggestion made by antiquaries visiting the excavations that the Avebury fosse might have been a moat supplied by the waters of the River Kennet, it was of particular interest at the time of the excavations in 1922 to read Mr. A. D. Passmore's short article entitled 'The Avebury Ditch', in *The Antiquaries Journal*, ii, 109-11, which was written without any reference or inquiry with regard to my surveys and observations at Avebury and, therefore, without knowing the full facts.¹ Hence the reason of some inaccuracies, especially when he says the ground-level, varying somewhat on the north and south of the monument, points 'to the conclusion that a ditch was planned with a level bottom irrespective of the original level of the ground at any one point, and that the ditch was not therefore made the same depth all round'. He also argues that 'a level of 10 ft. of water could be maintained in the moat surrounding Avebury Circles', and especially as 'the water-level was at least 10 ft. higher than to-day'.

During my stay at Avebury in 1922 my levels were brought into relation with those given on the Ordnance Sheet² and those recorded by Mr. A. H. Lawson in the article referred to. Before doing this it was apparent, from my sectional diagrams, that the levels of the bottom of the fosse in the different places excavated on the SSW. and

¹ He appears to have based his deductions entirely upon Cutting IX on the east side of the causeway—a cutting a part of which was left open for several years, so that when we returned after the war we hoped to be in a position to ascertain what the accumulation of natural silting had been since we left the work in 1914. But in the meantime the villagers had deposited some of their pots and pans here and spoilt our intentions (see p. 124).

² The larger upright figures in the diagram correspond with the levels above Ordnance Datum.

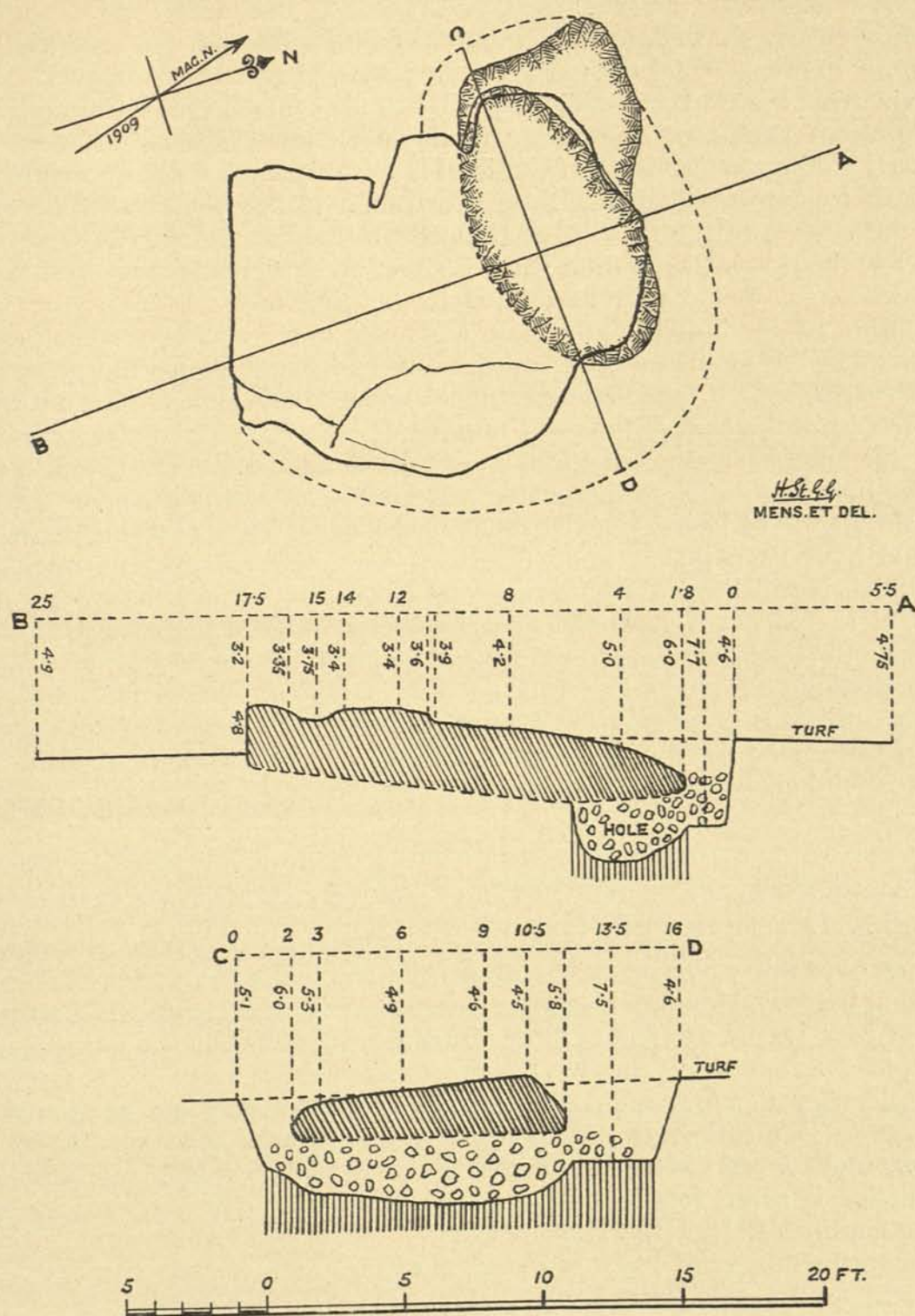


Fig. 5. Plan and sections of the excavation at the base of the most southern prostrate stone of the southern inner group, Avebury, 1909.

SSE. varied considerably, and that the floor of the fosse rose from west to east, as my five cuttings¹ clearly showed, to the extent of 11.6 ft., as seen in the sectional diagram (pl. xxxvi, fig. 2) prepared for the purpose: the length of ground represented comprised 413.2 ft., viz. from the west end of Cutting VIII to the east margin of Cutting IX.

The present surface of the silting in the fosse rises gradually eastwards from Cutting VIII to the western edge of Cutting III to the extent of 15.1 ft. This is largely due to wash from the high-road. From excavation it was found that in the same situation the bottom of the fosse rose gradually to the extent of 10.25 ft. from a level 3.81 ft. below the present bed of the River Kennet at New Bridge (which is, according to Mr. Lawson, 492.56²) to a level 6.44 ft. above the river bed.

In Cutting IX the bottom of the fosse was found to rise 7.55 ft. in a length of 25.5 ft. (see fig. 3). The west end is 0.24 ft. and the east end 7.79 ft. above the present bed of the Kennet stream. It would be interesting to know whether the floor of the fosse still rises to the east of the eastern limit of Cutting IX.

Had this fosse been converted into a moat we should have found much fine silt or mud at the bottom as well as the coarse angular blocks of chalk rubble. The chalk walls would also have been stained by stagnant water. The inevitable result of a wet ditch would have been that it could not easily be kept clear of the masses of chalk rubble and debris which from natural causes would fall from the chalk walls of the ditch and from the rampart above. If a moat was to be maintained the difficulty of clearing out the accumulations from time to time would be practically impossible.³

In the diagram (pl. xxxvi, fig. 2) the depth below the present surface of the fosse in the various cuttings is given, varying from 16.3 ft. to 30.25 ft. The approximate line of the great fosse under the modern road is indicated; and the position of the ancient causeway of solid chalk is also seen.

XIV. AVERAGE SECTION OF THE SOUTHERN FOSSE OF AVEBURY, SHOWING THE RELATIVE POSITION OF THE POTTERY, ANTLER PICKS, AND OTHER OBJECTS FOUND. Description of Pl. XLIV.

Having, over thirty-five years ago, drawn the average sections of the fosse of Wor Barrow (long barrow), Handley Down, for General Pitt-Rivers, figured in *Excavations in Cranborne Chase*, iv, pls. 250 and 251, the writer was prompted to put something similar on record, in diagrammatic form, for the great fosse of Avebury. This was done on a small scale after the first season's excavations, in reference to a length of 24 ft. of re-excavated fosse (Cutting I). As a result a section was given in *Report, British Association*, 1908, p. 406. This has now been considerably amplified, and in pl. XLIV an average section is given representing a length of about 134 ft. of the southern fosse, comprising Cuttings I, II, III, VIII, and IX.

Although the minimum depth of the fosse in the parts excavated was 16.3 ft.⁴ and

¹ The respective cuttings are marked by Roman numerals—I, II, III, VIII, and IX.

² 502 is the level of the parapet of this bridge.

³ *Wilts. Arch. Mag.*, xlii, 46, 121.

⁴ Cutting VIII was only 15.3 ft. deep at the SW. corner of the cutting, but just in this position there was a decided hump in the chalk at the bottom which was not noticed elsewhere.

the maximum (Cutting IX) was 30.25 ft., the average depth, for diagrammatic purposes, has been put at 19 ft. The turf and turf-mould was found to be about 1 ft. in depth everywhere. The average thickness of the surface silting below it was 2.75 ft. in the centre of the fosse, and the mixed silting, still lower, 4 ft. Below this a finer mixed silting generally occurred, which on an average was 2.25 ft. in thickness. The surface of the chalk rubble was reached, in the middle of the silting, at an average depth of 10 ft. below the surface.

For the purposes of this diagrammatic record the width of the fosse at the top has been given as about 30 ft.; and 15 ft. represents a fair average, so far as is known, for the width of the bottom of the fosse.

Some of the silted chalk was derived from the slipping of the loose rubble from the surface of the inner slope of the vallum, and partly from the solid sides of the fosse caused by the action of frost and rain after the construction of the earthwork, and at the time when the fosse became neglected and was allowed to fill up from natural causes. Concave seams of mould arising from turf and turf-mould falling from the top have not been shown in this diagram.

The whole of the chalk rubble may have become deposited in the course of a very few years (see p. 120), and when the whole profile of the fosse became covered the remainder of the silting must have accumulated in a decidedly decreasing ratio. These materials, which are of a sedimentary character and much finer than the deposits below, must have been either blown into the fosse from the outside or produced by rain.

Into this section the objects discovered have been projected, their position reckoned in accordance with proportionate depth and estimated ratio in the accumulation of the silting. All the chief remains have been included in the middle and bottom deposits, but to avoid confusion and overcrowding of the section the medieval pottery, etc., found in the surface silting in some quantity, and the modern objects found in the turf-mould, have been omitted. Practically nothing of the Roman period was found in the surface silting, which consisted chiefly of mould. The mixed silting represents the Roman period, and nothing below that deposit contained anything of Roman character.¹ The only 'find' of beaker pottery (no. 279) is shown on the top of the fine mixed silting at about the same level as some of the other prehistoric pottery and rather higher than the majority of fragments of pottery attributable, apparently, to the late Neolithic Period. Only two fragments of prehistoric pottery, nos. 93 and 168, were found deep in the chalk rubble.

Flint implements extended from and included the Roman stratum down to the bottom of the fosse, although very few were found in the chalk rubble. Some of them, although high in level, were revealed under chalk rubble against the margin of the fosse.

The human skeleton (no. 214, Cutting IX), adult female, estimated stature, 4 ft. 4 in., has been omitted in the section, as it is not known exactly how much silting had accumulated in the fosse when the interment was made, and it affords no evidence of value. Fragmentary human remains, however, are shown in the section as occurring in the mixed and fine mixed silting and also in the chalk rubble.

¹ A definite stratum of early Iron Age objects was not traceable in the parts of the fosse examined.

The shoulder-blade shovels, the antler rakes, and the worked rib-bones are shown on and near the bottom of the fosse.

This average section shows at a glance that a large number of antler picks were found, all of them in the chalk rubble which accumulated so rapidly. They date, therefore, from the time when the fosse was constructed, and the chalk thus 'quarried' thrown upwards and outwards to form the great vallum.

XV. THE POTTERY FROM THE AVEBURY EXCAVATIONS

By STUART PIGGOTT

Of the forty-odd sherds examined only fifteen could definitely be assigned with immediate certainty to any specific groups. Of these, four were typical Beaker fragments (all one find, no. 279, fig. 7), and the remainder of the late Neolithic type known as Peterborough ware or Neolithic Class B. This is a proportion of 37·5 per cent. of datable sherds.

The remaining sherds are undecorated, and mostly rather indefinite fragments of coarse wares such as are to be found from Neolithic to Romano-British times, and their date must finally be decided by their association with sherds with more recognizable features. Some doubt was, however, felt at first in including all these in one category, more particularly as certain sherds (e.g. nos. 123 and 210, figs. 6, 7) seemed in some respects to resemble the earlier Neolithic Windmill Hill ware (Neolithic Class A). The pottery from the famous Neolithic dwelling-site on Windmill Hill, so near the Avebury Circle, was the obvious group for comparison, and the texture and fabric of all the fragments have been closely compared with the sherds in Mr. Keiller's Museum.¹ The result of this examination was to establish that none of the undecorated pottery had features at all incompatible with a comparatively late dating, in a Peterborough ware-Beaker horizon, and that none showed features definitely characteristic of an earlier date.

The whole group of pottery may, then, be assigned to the overlap period in North Wiltshire between the end of the Neolithic, marked by the Peterborough ware (Neolithic B), and the dawn of the Bronze Age heralded by the Beaker. This is the period of the second occupation of the village on Windmill Hill, and the assemblage compares well with that from 'the Sanctuary' at the end of the Kennet Avenue on Overton Hill,² and with that from the chamber of the West Kennet long barrow.³ At the Sanctuary the proportion of indeterminate and undecorated sherds to those of Peterborough ware or Beaker was about 50 per cent., while at West Kennet the fragments preserved are all Peterborough and Beaker wares. But Mrs. Cunnington has shown⁴ that there is reason to suppose that Thurnam only preserved the decorated sherds.

¹ This work has been much facilitated by the assistance given by Miss M. V. G. James, Curator of the Museum, whose intimate knowledge of the varying textures of the Windmill Hill pottery has been invaluable.

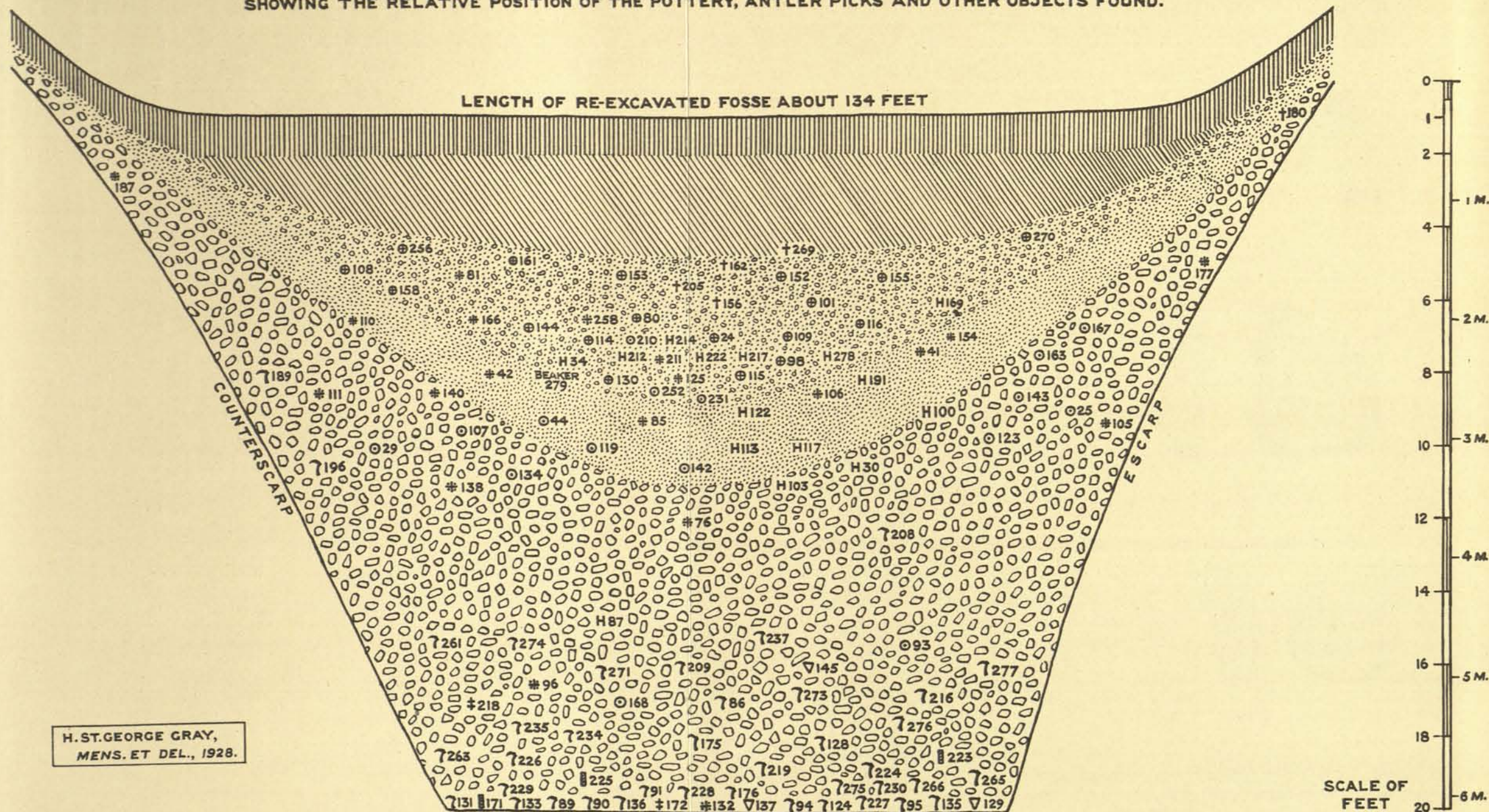
² *Wilts. Arch. Mag.*, xlv, 300-35.

³ *The Pottery from the Long Barrow at West Kennet*, M. E. Cunnington, Devizes, 1927.

⁴ *Op. cit.*, 3.

AVEBURY, WILTS.**AVERAGE SECTION OF THE SOUTH FOSSE,**

SHOWING THE RELATIVE POSITION OF THE POTTERY, ANTLER PICKS AND OTHER OBJECTS FOUND.

**REFERENCES
TO FINDS.**

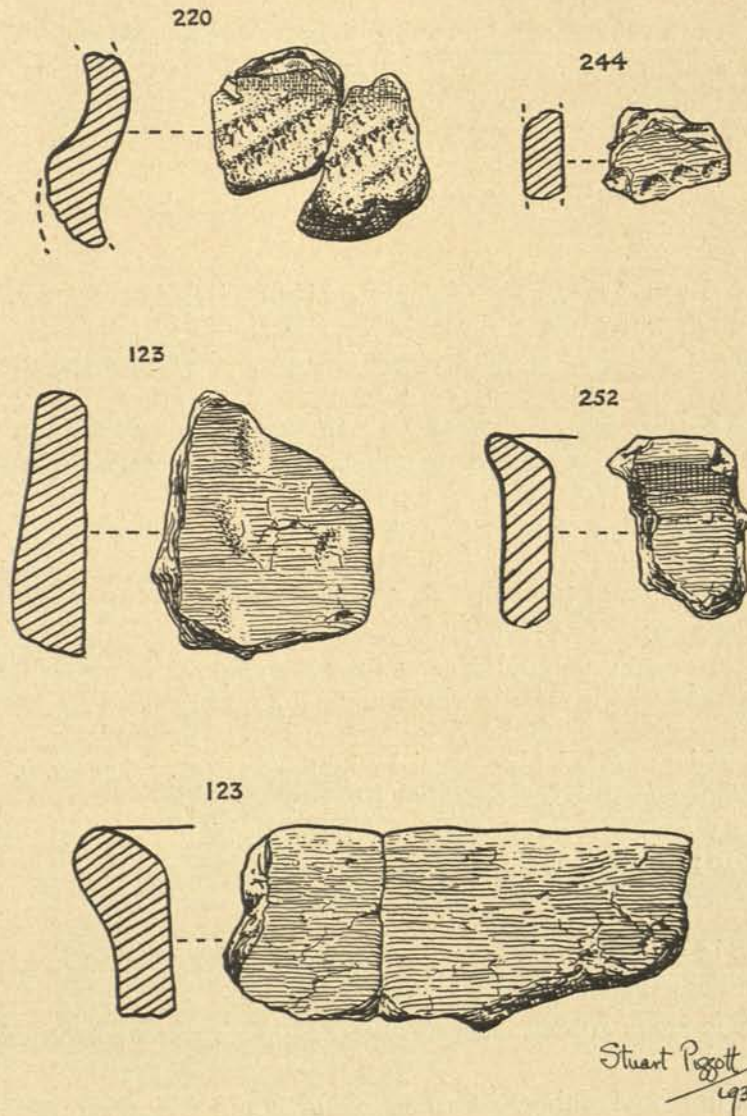
- ⊙ PREHISTORIC POTTERY (OR OF PREHIST. TYPE).
- ⊕ POTTERY OF THE ROMAN PERIOD.
- † METAL OBJECTS, ROMAN PERIOD.
- # FLINT IMPLEMENTS.
- H. HUMAN REMAINS (FRAGMENTARY).

- ∟ PICKS OF ANTLER.
- ▽ BONE SHOVELS (SCAPULÆ).
- ‡ ANTLER RAKES.
- ▨ WORKED RIB-BONES.
- M. METRES (IN SCALE).

**REFERENCES
TO SILTING.**

- ▨ TURF AND TURF MOULD.
- ▨ SURFACE SILTING (CHIEFLY MOULD).
- ▨ MIXED SILTING.
- ▨ FINE MIXED SILTING.
- ▨ CHALK RUBBLE.

While the two cultures of Neolithic Britain, A and B, are probably to be considered as broadly contemporary in their initial stages, in North Wiltshire the B culture is demonstrably later than A, and is but little anterior to the Beakers.



Stuart Pigott
1932

Fig. 6. Prehistoric Pottery found at Avebury. $\frac{1}{2}$.
No. 123, Cutting II, and no. 252 (unclassified), Cutting IX, Fosse; and nos. 220 and 244 (Neolithic B), Cutting X, found on old turf line under the vallum.

The occurrence of abraded fragments of Peterborough ware on the old turf line beneath the great vallum of Avebury gives absolutely unequivocal evidence of the date of the construction of the monument, more definite than the occurrence of similar sherds at a comparatively high level in the vast accumulation of silt in the ditch, but these sherds, and the Beaker fragments from a similar level, all give added support to an early Bronze Age dating.

DETAILS OF THE POTTERY

I. From the Ditch

Beaker.

No. 279. Cutting IX, 6.5 ft. at bottom of mixed silting. Four sherds of typical red Beaker ware, free from grit and with smooth exterior, which is reddish-brown. Interior disintegrated, greyish-brown, average thickness 7-8 mm. Decoration on all sherds in typical hyphenated technique forming horizontal, vertical, or herring-bone lines. Possible traces of white inlay still remaining. See fig. 7.

Cf. Sanctuary, *passim*; West Kennet, nos. 97-III.

Neolithic B (Peterborough) ware.

No. 163. Cutting VIII, 6.5 ft. close to top of chalk rubble. Two fragments of the upper part of a bowl of Peterborough ware, one a rim sherd. The rim is slightly everted and simple. The ware is black, almost gritless,¹ smooth black exterior, fairly smooth brownish interior. The exterior has four horizontal lines of cord impression, about 3 mm. wide. Inside are two horizontal lines of cord impression, some 1.6 cm. apart, between which is a line of oval impressions made with a pointed tool, 10 mm. by 5 mm., spaced at intervals of about 1.2 cm. See fig. 7. For exterior decoration *cf.* West Kennet, 4 and 78.

No. 167. Cutting VIII, 6 ft. close to top of chalk rubble. Fragments partly restored of the upper part of a very fine bowl of Peterborough ware. The ware is very good and almost entirely free from grit, and both interior and exterior are highly smoothed. Interior black, exterior brownish-buff to light red. The form is an overhanging collar-type of rim, with slight hollow neck moulding below; a form typologically fully developed, but probably not chronologically very late. It is associated with bowls with round and flat bases.

The exterior is decorated with a herring-bone design of lightly impressed 'maggots', 1.2 cm. long and 3-4 mm. wide, of fine whipped cord with 8-10 'ribs'. See fig. 7.

For the form *cf.* Wandsworth (*Archaeologia*, lxi, 10).

For decoration (very common on Peterborough ware and its foreign analogues) *cf.* especially Sanctuary, 3-5, 8, 10; West Kennet, 16 (?).

Unclassified.

No. 25. Cutting I, 7 ft. in chalk rubble. Small sherd of sandy ware, buff exterior, brown interior, medium and abundant grit, thickness 9 mm.

No. 29. Cutting I, 8 ft. in chalk rubble. Small sherd of black ware, smoothed inside and out, fine grit, thickness 6 mm.

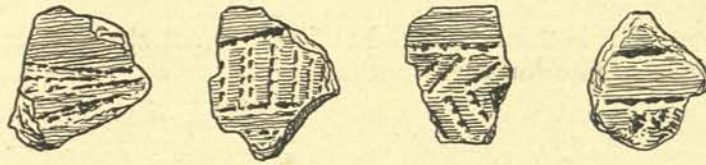
No. 44. Cutting I, 7 ft. in mixed silting. Two sherds of abraded greyish ware, fairly abundant grit, thickness 1 cm.

¹ A small fragment of pottery belonging to no. 163 was sent at the time of discovery to the late Mr. Clement Reid, F.R.S., for close examination, and he wrote the following report upon it:

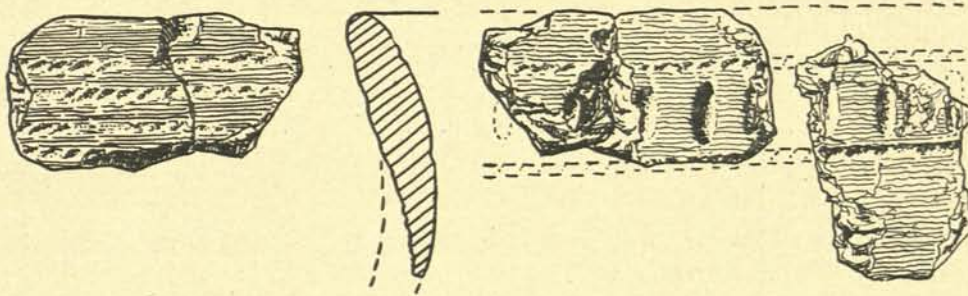
'The "grout" or coarse material used for stiffening this pottery and making it keep its shape when burnt in an open fire, is of unusual composition. It consists mainly of burnt bone, with a few minute bits of charcoal. I think that ashes of a fire have been used, as being grit that would not fly, shrink, or burn out when the pottery was fired; there are also one or two small fragments of flint. The clay with which this "grout" was mixed seems to have been a coarse sandy clay with large rounded grains of quartz. Probably the so-called "clay-with-flints" so common on the chalk-downs was used. As far as one can judge from so small a sample, only enough clay was used to bind the material.'

No. 93. Cutting I, 12.5 ft. in chalk rubble. Small sherd of coarse sandy ware, red exterior, brown interior, medium to large grit, thickness 9 mm.

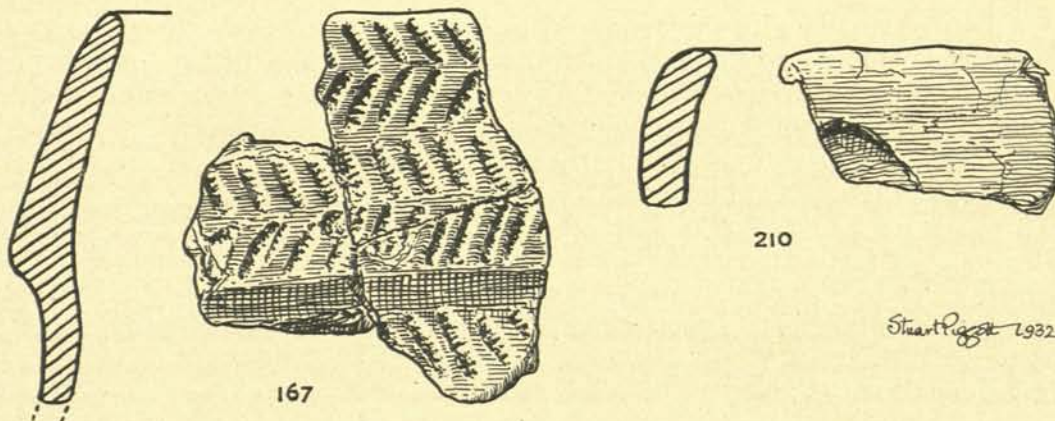
No. 107. Cutting II, 8.7 ft. in chalk rubble. Very small sherd of greyish-brown ware with no grit, black interior, reddish exterior, abraded, thickness 5 mm.



279



163



167

210

Stuart Pigott 1932

Fig. 7. Prehistoric Pottery found in the Fosse at Avebury. $\frac{1}{2}$.
No. 279, Beaker ware, Cutting IX; nos. 163 and 167, Neolithic B ware, Cutting VIII; and no. 210, unclassified, Cutting IX.

No. 119. Cutting II, 9.3 ft. in mixed silting. Small sherd of greyish ware, few small grits, smooth surface, black interior, brown exterior, thickness 6 mm.

No. 123. Cutting II, 8.5 ft. in mixed silting. Three fragments of rather soft ware with very few grits, grey core, reddish-buff interior, brown exterior. Two rim fragments join, showing a thickened, slightly everted rim, bevelled internally. The original diameter (external) would be some 22 cm. The third fragment has a slightly darker exterior, with what was probably a double vertical line of oblique shallow finger-nail markings. One line is certain, the other probable.

Thickness 1.2 cm. The last-named similar to a piece from the West Kennet long barrow (British Museum). See fig. 6.

- No. 134. Cutting II, 9.5 ft. at bottom of mixed silting. Small sherd of coarse black ware, grit almost absent, black interior and reddish-buff exterior. The exterior has an unornamented shoulder or cordon. Thickness 1.3 cm.
- No. 142. Cutting III, 12.3 ft. at bottom of mixed silting. Small sherd of greyish ware, few grits, buff exterior, disintegrated interior. Thickness 5 mm.
- No. 143. Cutting III, 11 ft. near top of chalk rubble. Sherd of greyish ware, no grit. Slightly abraded, and surfaces pitted by decomposition of elements in the paste — ? small pieces of grass burnt out. Thickness 8 mm.
- No. 168. Cutting VIII, 14 ft. in chalk rubble. Very small sherd, slightly sandy, medium grits. Red exterior, disintegrated, interior brown. Thickness 5 mm.
- No. 210. Cutting IX, 5.7 ft. with human skeleton. Two sherds probably of the same pot, although the rim fragment is rather lighter in colour than the other. Both of softish ware, reddish-buff exterior, blackish-brown interior. Very little grit. The rim is simple and slightly incurved. This section is paralleled in the Peterborough ware levels at Windmill Hill, where the sherds are however decorated. Average thickness 1 cm. See fig. 7.
- No. 231. Cutting IX, 7.7 ft. in mixed silting. Sherd of coarse ware, red exterior, black interior, large to medium grits. Thickness 1.3 cm.¹
- No. 252. Cutting IX, 7.5 ft. in mixed silting. Rim fragment of hardish smooth ware, little or no grit. Exterior brown, interior black. The rim is bevelled and everted—a slightly sharper form of no. 123.² See fig. 6.

II. From the Old Turf Line under the Vallum, Cutting X

Neolithic B (Peterborough) ware.

- No. 220. Of the five sherds with this number two (joining) are small sherds showing the hollow neck and keeled shoulder of a typical Peterborough ware bowl. They are of greyish ware with few medium flint grits and are abraded. They are decorated on the exterior with diagonal 'maggots' of coarse whipped cord, of uncertain length and 4 mm. wide. The impression of the twisted strands of the cord can be clearly seen, a feature noticeable on several sherds of the East European prototypes of this ware. See fig. 6.
- No. 243. Three abraded sherds of pinkish-grey ware with few large flint grits. Although much worn, the exterior retains traces of impressed pattern, either cord or bird-bone.³
- No. 244. Small sherd with few small grits, red exterior, black interior. Decorated on exterior with three crescentic impressions 4 mm. wide, probably made with a bird-bone. Thickness 8 mm. See fig. 6.
- Cf.* West Kennet, 11, 27, 30.

¹ On this fragment Mr. C. Reid wrote as follows: 'The chalk-flint looks as if it had been intentionally crushed and added to the paste for stiffening. The quartz grains probably came from Tertiary deposits. Samples of clay as coarse as this can often be found over the chalk downs. It may have been baked by piling brushwood over the inverted pot. I see no sign of chalk or charcoal having been used in this paste.'

² Mr. C. Reid described no. 252 as follows: 'Soft paste stiffened with fragments of old pots and some grit. Well burnt outside to rim; black and slacker baked inside, suggesting that the pot was inverted and fire could only reach outside.'

³ The late Mr. C. Reid examined one of the coarsest unornamented fragments, and wrote: 'Thin, well-burnt pottery, not local; the grit is all vein-quartz, and suggests Bristol coal-field.'

Unclassified.

No. 194. Small sherd of hard sandy ware, medium grits, brown to black exterior, black interior. Thickness 1 cm.

No. 195. *Not examined.*

No. 202. Small sherd of ware identical with no. 194.

No. 203. *Not examined.*

No. 220. The three sherds under this number not of definite Peterborough ware comprise one of identical ware to nos. 124 and 202, and two abraded sherds of pale reddish ware with medium grits, buff interior, red exterior.¹

No. 251. The two small fragments of burnt clay with this number are apparently not actually pottery. One is hard, the other soft and crumbly.

XVI. THE FLINT IMPLEMENTS, AVEBURY EXCAVATIONS

By J. G. D. CLARK, M.A., PH.D., F.S.A.

The majority of the flint implements came from the silting of the fosse—'mixed silting' and 'chalk rubble'—but a certain number comes from the old turf line near the foot of the vallum. Details relative to provenance will be found in the table.

Almost all the flints with secondary flaking are patinated densely to a white colour, cherty inclusions being in some cases grey; four specimens, however, are patinated only to a slight degree and two are quite unpatinated, these six all coming from the upper levels of the fosse silting—'mixed silting'. Rust-coloured stains are noticeable on nos. 112, 140, 141, and 258.

The flint hammerstone (no. 247) and the cores (nos. 146, 147, and 214), together with several untouched primary flakes, suggest that flint working was carried on either in the ditch or in the immediate neighbourhood.

The types of implement represented are disappointingly uninformative. The commonest are various forms of convex scraper, six being of the horseshoe form, three on the end of flakes, and four of irregular form. One of the end-scrapers (no. 200, pl. XLVI) is finely serrated along one edge, but shows no lustre. Three more serrated flakes were obtained from the old turf line near the foot of the vallum; one of these (no. 204) is calcined but shows signs of a narrow band of lustre due to sawing bone or wood;² another (no. 245) has been used so much as to destroy most of the serrations, though showing no signs of lustre, and the third (no. 255) shows no signs of use or of lustre. It is interesting that the four serrated flakes mentioned all occurred in the old turf line and are, therefore, older than the fosse; the type was used extensively by people with Windmill Hill or Neolithic 'A' culture, but in common with all the flint types of this culture it seems to have lived on into the Bronze Age. A fifth finely serrated flake (no. 211) comes

¹ Of one of these fragments Mr. C. Reid wrote: 'Not local; paste black and sandy, and full of splinters of grit, with some large quartz-grains. The splinters look like Carboniferous Limestone chert, rather than chalk-flint, but there is not enough material to be certain. Perhaps from the Mendips.'

² E. C. Curwen, *Antiquity*, June 1930, iv, 186.

from the mixed silting of the fosse and shows no lustre.¹ Among the flints found with the skeleton in the mixed silting were a core (no. 214, pl. XLVI), four primary flakes, and a long flake very coarsely serrated, the secondary working designed to isolate the teeth being achieved from the upper and lower faces of the flake alternately; it shows no sign of lustre.

The most informative pieces found are two typical plano-convex knives (nos. 154 and 177, pl. XLVI). Both specimens retain their primary flake bulbar faces, the convex faces having the typical shallow secondary pressure flaking. No. 154 is slightly asymmetrical, but does not differ in this respect from others of this class of implement. The only evidence for dating this form has been published by the present writer in full² and may be summarized here. An analysis of the funerary associations of the plano-convex knife in this country has shown that it is to be identified closely with the food-vessel culture; thus out of the twenty-eight good associations with other datable objects with burials, in no less than twenty-three instances the only pottery present was food-vessel accompanied by beaker; in no single case was beaker the only pottery. This evidence shows that the plano-convex knife belonged to the food-vessel culture with which it is found associated in Ireland, Scotland, and parts of England, but was contemporary in time with, at any rate, some beakers (e.g. Painsthorpe, barrow 83; beaker, food-vessel, and plano-convex knife associated, Mortimer, fig. 285). On more general grounds it is clear that the plano-convex knife might in the south-east of England be found to belong to the beaker period, or rather to that part of the beaker period which overlaps with the food-vessel period. For the food-vessel culture was only established well in the highland zone of Britain and its outliers; elsewhere it seems to have been a weak growth. That the food-vessel culture of the highland zone, and the beaker cultures pushing into the lowland as well as the highland, were contemporary to a considerable extent, is shown by the numerous instances of beaker and food-vessel ceramic in the same grave; this is characteristic of the Yorkshire Wolds, where the beaker people impinged upon an established food-vessel culture, with origins in the Neolithic 'B' culture of these islands. There is, therefore, no reason why in the south of England the plano-convex knife need indicate a *date* later than the beaker period—a 'period' of which the extent is in the south of England not yet very well defined,³ but which probably includes the greater part at least of the food-vessel period of the highland zone. Both the typical plano-convex knives occurred fairly high up in the 'mixed silting' of the fosse.

From a much greater depth in the 'chalk rubble' of the fosse comes another flake knife with fine secondary flaking (no. 96, pl. XLVI). In this case the secondary working does not cover more than a fraction of the convex surface, but its technique is very similar to that on nos. 154 and 177. It is hardly possible to be positive in this case, but it seems difficult to separate it from the plano-convex class.

¹ This specimen is preserved in the Pitt-Rivers Museum, Oxford. All the other flint implements are in Devizes Museum.

² J. G. D. Clark, *Antiq. Journ.* April 1932, xii, 158.

³ Beaker pottery is found to occur with wares of food-vessel affinities in the lowland zone, e.g. at Plantation Farm, Shippea Hill, near Ely, which also produced plano-convex knives. *Antiq. Journ.* July 1933, xiii, 266.

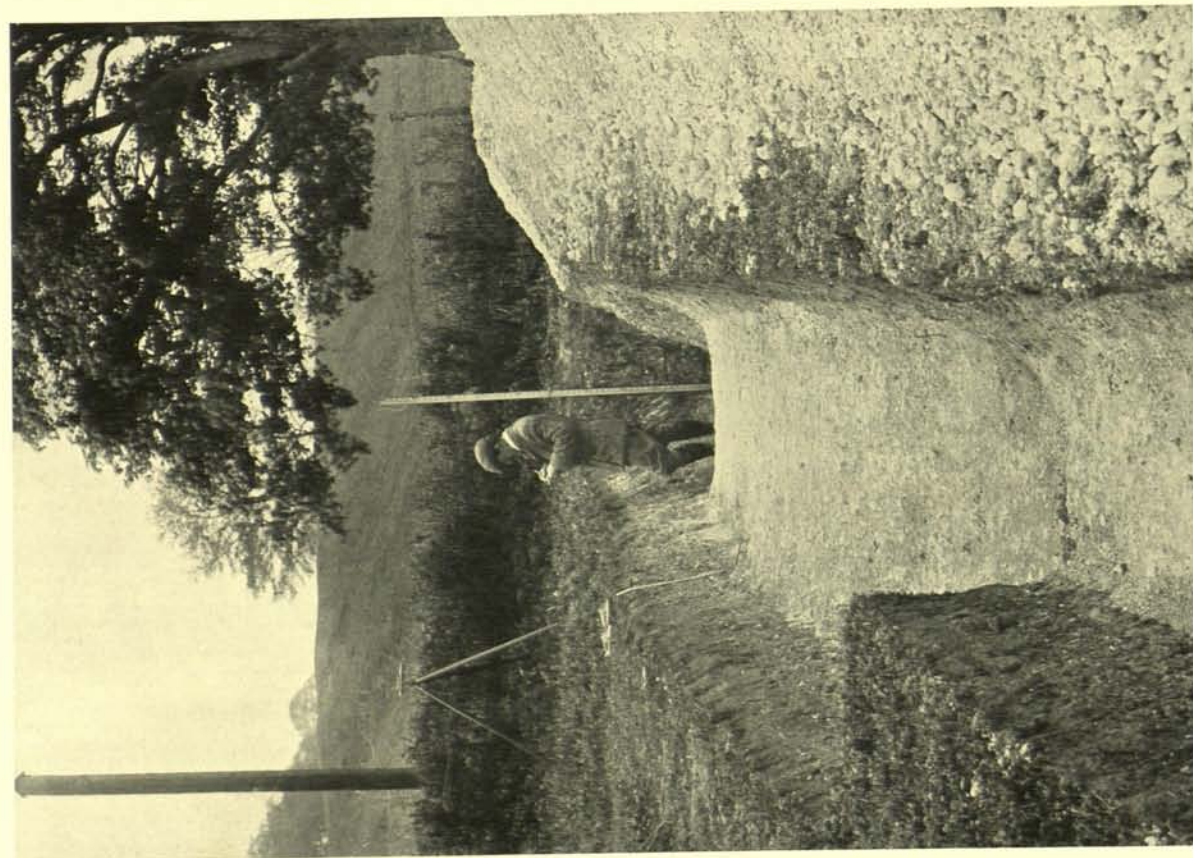


Fig. 1. Cutting IV across the southern Entrance Causeway, looking WSW. The solid chalk trackway is well seen sloping away in both directions (1909)

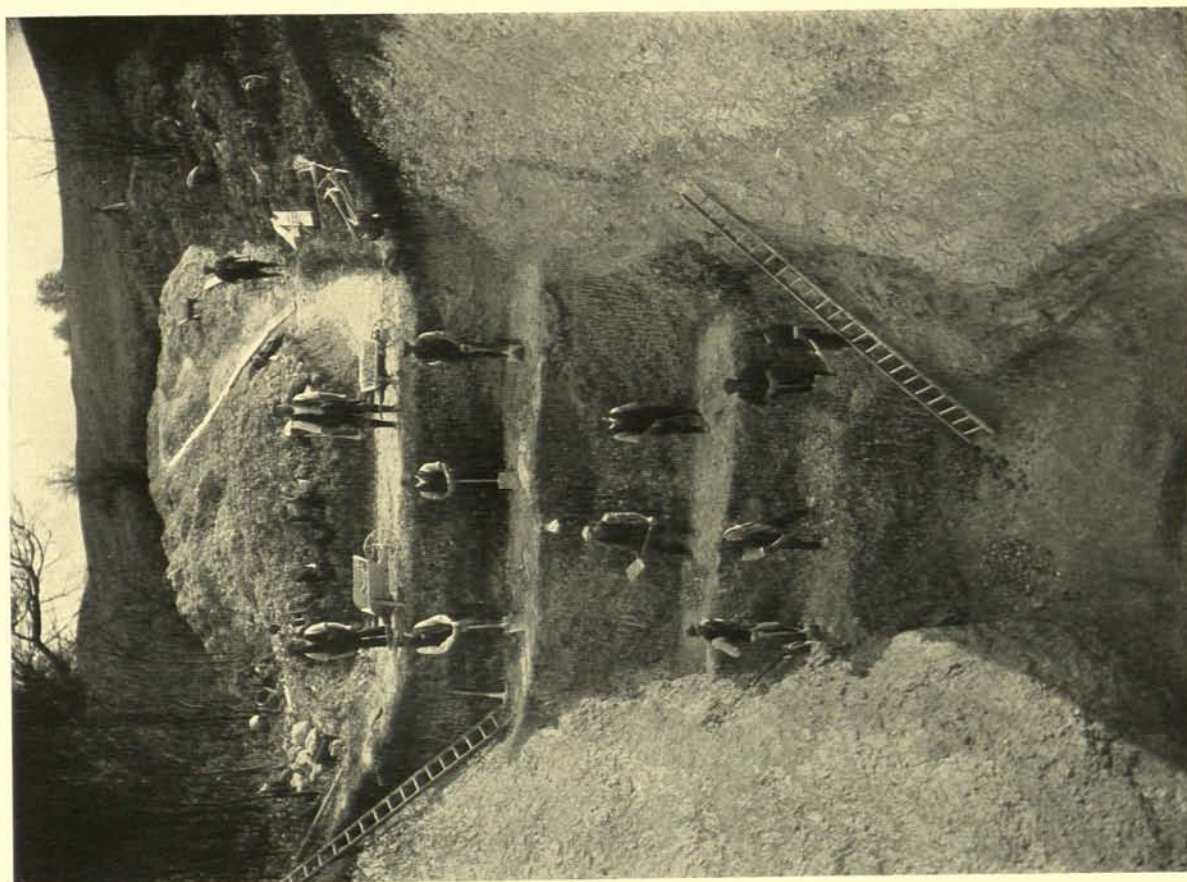
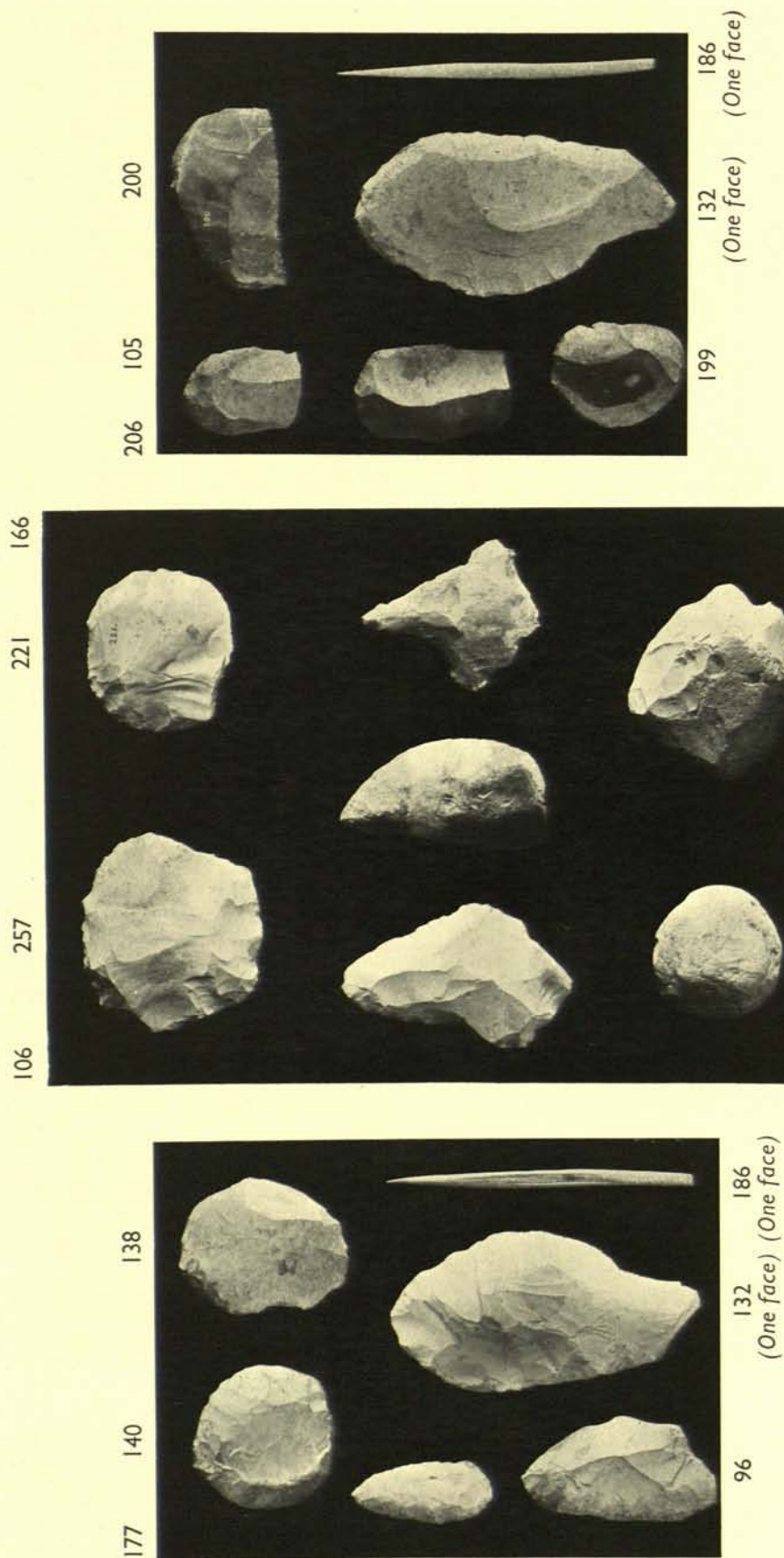


Fig. 2. View of the E. end of the Fosse, Cutting IX, taken from the W., from the top of the Entrance Causeway, showing the manner in which the silting was removed (21 April 1922)



Flint Implements and Bone Pin found in the Fosse and Vallum at Avebury
(Scale rather less than $\frac{1}{2}$)

Published by the Society of Antiquaries of London, 1935

We are left with one very puzzling piece (no. 132, pl. XLVI, two views) from the bottom of the fosse at a depth of 17.8 feet. It is too individual a piece to be of much value for dating, but merits special description. It is flaked to an irregularly lanceolate form by secondary flaking on both faces; the straighter edge has been blunted, but the more convex has been sharpened by fine shallow secondary flaking on both faces and shows traces of diffused lustre suggesting use for cutting straw. An implement only $3\frac{1}{2}$ in. (89 mm.) long and with a convex cutting-edge can hardly be classed as a sickle in the normal sense. The lustre is similar to that seen on some of the concave-edged single-piece flint sickles described by the present writer,¹ and the way it is diffused over the flake scars suggests it was used for cutting straw stalks. Presumably it cannot have been used with the swinging action of the true sickle, but may have been used for removing the heads of grain plants singly. The single-piece flint sickle was probably introduced by the Peterborough people, but seems to have continued in use into the Bronze Age. If it is permissible, which is more than doubtful, to class no. 132 with this group, it gives us the maximum possible date for the fosse.

¹ J. G. D. Clark, *Proc. Preh. Soc. E. Anglia*, 1932, vii, 67. See also Eliot Curwen and E. C. Curwen on 'A Flint Sickle-flake from Selmeaton, Sussex', *Antiq. Journ.* Oct. 1934, xiv, 389.

XVII. FLINT IMPLEMENTS FOUND AT AVEBURY

All from Fosse, except those from Cutting X, which are Vallum.¹

The specimens marked with an asterisk (*) are figured in pl. XLVI.

Cat no.	Description.	Cutting.	Deposit in which found.	Depth below surface.
42 ²	Knife with dorsal ridge, slightly worked along both edges, bearing evidence of prolonged use.	I	Mixed silting	6.3 ft.
76 ²	Worked flake.	I	Chalk rubble	10 ft.
81 ²	Scraper-like flake, rough, oval, prominent bulb of percussion, half back covered with cortex.	I	Mixed silting	4 ft.
85 ²	Flake worked to a bevelled edge along one side, dorsal ridge not high.	I	Chalk rubble	7.3 ft.
96	*Flake knife with shallow secondary working along one edge continued round the tip; patinated white (p. 142).	I	Ditto	13 ft.
132	*Irregular lanceolate flint with secondary flaking over both faces, in one case more extensively than in the other (see above). The straighter edge has been blunted, but the more convex has been sharpened by shallow flaking on both faces and shows signs of diffuse lustre; patinated white. (With it a scorched flint and piece of charcoal.) Two views of no. 132 are given in pl. XLVI.	I	Ditto	17.8 ft. (bottom of the fosse)
—	Four large pieces of flint, bearing slight signs of rough flaking and hammering.	I	'In upper strata of silting'	—
—	Core.	II	Bottom of surface silting	—
105	*End scraper with butt missing, and traces of cortex remaining; patinated.	II	Chalk rubble	7.8 ft.
106	*Irregular scraper, patinated white.	II	Mixed silting	7 ft.
110	Oval scraper with two periods of work; primary flakes patinated white and secondary work mottled grey.	II	Ditto	5.3 ft.
112	Patinated flake showing secondary working of a later period.	II	Chalk rubble	6.5 ft.

¹ This Table was drawn up by J. Grahame Clark and H. St. George Gray.

² These four implements were not examined by Dr. Grahame Clark.

<i>Cat. no.</i>	<i>Description.</i>	<i>Cutting.</i>	<i>Deposit in which found.</i>	<i>Depth below surface.</i>
125	Horseshoe scraper, unpatinated, and showing part of the cortex.	II	Mixed silting	6.7 ft.
138	*Oval scraper, patinated white.	II	Ditto	9.5 ft.
146	Core, patinated white.	II	Chalk rubble	9.5 ft.
140	*Discoidal scraper, showing indications of considerable use; patinated white and flecked with rust-coloured staining.	III	Mixed silting	9.5 ft.
141	Roughly chipped implement, patinated white.	III	Ditto	9.5 ft.
147	Core, slightly patinated.	III	Ditto	12.5 ft.
154	*Finely chipped knife (p. 142), of plano-convex section, worked on convex surface only and from both edges; butt-end shows cortex of the core from which the implement was struck; length 61 mm., max. width 30 mm., max. thickness 8.5 mm.; only slightly patinated. (Badly fractured by being struck by an iron pick, but now neatly repaired.)	VIII	Ditto	5.7 ft.
166	*Concave flake scraper and awl, with some cortex remaining; very slightly patinated, mottled grey.	VIII	Ditto	4.6 ft.
177	*Small knife, of plano-convex section, with shallow secondary flaking over the greater part of the convex face; densely patinated (p. 142).	IX	Ditto	5 ft.
187	Flake showing some secondary working, including a notch; unpatinated.	IX	Top of mixed silting	—
211	Finely serrated flake showing no lustre; patinated white (see pp. 141, 147), found with human skeleton.	IX	Mixed silting	6.5 ft.
214	*Core, large, densely patinated (see pp. 141, 142, 147), found with human skeleton.	IX	Ditto	5.8 ft.
247	Hammerstone, large, found in burnt material (see p. 148).	IX	Ditto	7.5 ft.
257	*Scraper, large (54 by 57 mm.), rough workmanship; patinated white.	IX	Ditto	About 6.5 ft.
258	Implement, perhaps a scraper; very slightly patinated, grey flecked with white, and showing patches of rust-coloured stain.	IX	Ditto	5 ft.
198	Broad end-scraper, slightly patinated, mottled grey.	X	O.T.L. (Old turf line)	Near foot of vallum
199	*Scraper, elongated horseshoe shape, patinated white.	X	Near no. 198	—
200	*End-scraper and serrated flake, showing no edge lustre; slightly patinated, mottled grey (p. 141).	X	Ditto	—
204	Finely serrated flake, showing narrow band of edge lustre; calcined (p. 141).	X	O.T.L.	—
206	*End-scraper, retaining considerable area of cortex; patinated white.	X	O.T.L.	—
207	Fragment of unidentifiable object, flaked on both faces, patinated white.	X	O.T.L.	—
221	*Horseshoe scraper, patinated white.	X	O.T.L.	Near foot of vallum
242	Scraper of horseshoe form, patinated whitish-grey.	X	O.T.L.	—
245	Serrated flake showing considerable signs of use; patinated white (p. 141).	X	O.T.L.	—
255	Serrated flake showing no lustre; patinated greyish-white (p. 141).	X	O.T.L.	—

XVIII. TABLE OF FLINT FLAKES FOUND AT AVEBURY ^a

All from Fosse, except those from Cutting X, which are Vallum.

Cutting.	Down to depth of 4 ft.	Between 4.1 ft. and 6.5 ft.	Between 6.6 ft. and 15 ft.	Below 15 ft.	Total counted.	Remarks.
I	8	29	37	—	74	All the flakes from this cutting counted on the ground. One was numbered 111, depth 7 ft.
II	8	43	68 ^b	1	120	All the flakes from this cutting counted on the ground. One was numbered 120, depth 9.5 ft.
III	— ^c	21	78	—	99	All the flakes from this cutting counted on the ground.
VIII	—	3	—	1 ^d	4	The other flakes were not preserved nor counted on the ground.
IX	—	Several	—	—	—	Several flakes (one burnt) were found with the human skeleton (no. 214), depth 5.8 ft.
IX	1	17 ^e	—	2	20	Mostly found with deposit of burnt material (no. 247).
X	—	—	—	—	66 ^f	These flakes (patinated light grey and white) were collected from the old turf line under the vallum. Two of them were numbered 190 (depth 6.5 ft.) and 241 (depth 13.7 ft.).
				Total	383	

^a The great majority were patinated white, but a few were pale grey and some a darker grey.^b Forty-four of these were found between 8 ft. and 10 ft. deep.^c Large accumulation of washed-in surface silting here.^d Found on bottom of the fosse.^e Eight of them calcined. One found with beaker pottery, no. 279, depth 6.5 ft.^f Four of them burnt.

XIX. SKELETON AND OTHER HUMAN REMAINS, ALSO DEPOSITS OF BURNT MATERIAL, FOUND IN THE SILTING OF THE FOSSE, CUTTING IX

At a distance of 17.4 ft. from the east end in the middle of this cutting, a contracted human skeleton (no. 214), fully adult but of small size, was uncovered at a depth of 5.8 ft. below the surface of the silting. The unexpected discovery was made in mould with very little admixture of chalk, at a time, unfortunately, when the surrounding ground owing to a drizzling rain was sticky and slippery. The writer's absence at breakfast was also unfortunate, for on his return some of the bones had been removed, and the skull had apparently been trampled upon before any part of it was actually recognized by the workmen engaged on this spot. Some of the bones had been thrown back; these, however, were collected, the picks were set aside, and the clearing of the interment and the surroundings was then carried out by Mrs. Gray and the writer, with the assistance of one man. It was seen at once that the skeleton, although the bones were in sequence, was in a decidedly bad state of preservation. The flexed knees touched a large sarsen stone, and the head was to south. The long-bones were much decayed, with the exception of the right tibia,¹ which, however, was fractured; it was carefully measured in the ground, the length being 286 mm. (11 $\frac{1}{4}$ in.), which, by Topinard's and Rollet's

¹ The tibia is not platycnemic, the latitudinal index being 731.

formulae and taking the mean, gave a stature of only 4 ft. 3.88 in. for a female. She must therefore be classed as a dwarf.¹

The skeleton was surrounded by twenty-three sarsen stones (measuring from 6 in. to 24 in. in length), not arranged in a very orderly fashion, but covering roughly an oval area about 7 ft. by 4.5 ft. One of the stones appeared to be half a 'ring-stone'. See plan, pl. XLIII, fig. 3.²

The calvaria of the skull was repaired as far as possible, and was examined by Professor W. Wright, F.S.A., who reported as follows:

'The cranium was evidently of oval shape and of considerable but not extreme length. The frontal bone was in two pieces owing to the persistence of the metopic suture. The other sutures of the calvaria were only beginning to be obliterated. The skull bones are remarkable for their thickness. It is interesting to note in the fragment of the occipital region that the thick character ceases at the superior curved line. From a small piece of the frontal bone one gathers that the supraciliary eminence was not well marked. The mastoid processes are small. The remains also includes a portion of the right side of the body of the mandible. The lateral incisor, canine, and first and second bicuspid teeth are all considerably worn, particularly the first two and the second bicuspid. The first molar must have been lost during life as its socket is entirely closed. The skull belonged to an individual probably over thirty years of age and of the female sex.'

Three human mandibles were found near the skeleton and at a slightly greater depth, and another in the NW. part of the cutting. Between these remains and the human skeleton the chin regions of the mandibles permit of comparison. Professor Wright reports that 'they suggest a close relationship between the individuals, for they bear a close resemblance to each other. The chins, moreover, are strong and firm.'

It will be convenient to give the details of the mandibles here.³

No. 191. Symphysial part of the mandible of a man (height at symphysis 30 mm.); no teeth remaining; in a weathered condition. 'Its chief feature is the breadth and strength of the chin' (W. Wright).

Found in the lower part of the mixed silting (loamy chalk silt) and above the chalk rubble in the NW. part of Cutting IX.

No. 212. The left half and the region of the angle of the right half of the mandible of a man;

¹ Dwarf skeleton from Dog Holes, Warton Crag, Lancs. Four bones of this individual are sufficiently perfect for measurement, and these are a left tibia (length 305 mm.), a left fibula (length 292 mm.), a left radius (length 226 mm.), and a right humerus (length 258 mm.). In all probability the Dog Holes femora were about 365 mm. in length when perfect. Adopting Rollet's and Topinard's formulae for calculating the height, we get an average stature from the four bones for the dwarf of 4 ft. 4 $\frac{3}{4}$ in. The epiphyses are united, showing that growth was complete. Age about twenty-five years. There is apparently an absence of pathological conditions (*Trans. Lancs. and Chesh. Antiq. Soc.* xxx, 1913, 113-14).

² Near the top of Roman stratum above—in various places but more or less over the position of the skeleton—lumps of sarsen had been met with; two pieces measured 18 in. in length each; another 27 in. by 18 in. by 7 in.; and another 21 in. by 18 in. by 7 in. Farther west a large sarsen slab was found in the surface mould, length 47 in., max. width 24 in., max. thickness 11 in. (thin on all sides). The latter was probably split off one of the stones of the outer circle and shot over into the fosse. Between Cuttings IX and X on the surface of the silting of the ditch a piece of sarsen stone was noticed; it was found to be 4 ft. long.

³ Part of a lower jaw, no. 30, was found at a depth of 8.3 ft. in the chalk rubble in Cutting I, 1908.

somewhat weathered, like the other fragments of lower jaws, nos. 191, 217, and 222, as if they had been exposed upon the surface at some time. 'There is nothing noteworthy about this mandible unless it be that the age of the individual was probably from thirty-five to forty-five years of age' (W. W.).

Found in the mixed silting at a depth of 6.2 ft. below the surface in Cutting IX.

No. 217. Part of a small mandible consisting of the chin and part of the right side, with the sockets of the bicuspid teeth remaining; weathered. 'It probably belonged to a female, and the chin, making allowances for the sexual differences, has the same conformations as that of specimens nos. 191 and 214' (W. W.).

Found in the mixed silting at a depth of 6.8 ft. below the surface in Cutting IX.

No. 222. Part of the right side of the body of a mandible, the ascending ramus missing; of the teeth only the first and third molars remain. 'The last molar is only slightly, if at all, worn, and therefore probably the specimen came from an individual whose age was something in the early twenties' (W. W.).

Found in the mixed silting at a depth of 6.3 ft. below the surface in Cutting IX.

Associated with the human skeleton, the following objects were found, all bearing the same number, no. 214, except the serrated flake, no. 211, and two fragments of pottery, no. 210.

- (a) Ball of solid chalk, rudely shaped and having an average diameter of 36.5 mm. ($1\frac{7}{16}$ in.), and similar to several which have been found in the Windmill Hill excavations.¹ Figured in pl. XLVI.
- (b) Large flint core (pl. XLVI, and pp. 141, 142, 144).
- (c) Several flint flakes, one of which is burnt (p. 145).
- (d) Metacarpus of sheep, length 138 mm.; least circumference 48 mm.; estimated stature 2 ft. 2 in.
- (e) Nineteen fragments of prehistoric pottery, hand-made and of soft paste. There is no trace of ornament. Some of the pieces are black all through; some black inside and reddish-brown outside. They represent fragments of more than one pot and vary in thickness from 6 mm. to 14 mm. Most of the pieces contain a small admixture of quartz grains, but for the most part they are very small.

No. 210. Two fragments of prehistoric pottery, shown in fig. 7, p. 139, and described on p. 140. Found at a depth of 5.7 ft. below the surface, 4 ft. NW. of the pelvis of the human skeleton.

No. 211. Serrated flint mentioned on pp. 141, 144. Now in the Pitt-Rivers Museum at Oxford. Found in the mixed silting under the skeleton, at a depth of 6.5 ft. below the surface.

Deposits of Burnt Material from the Fosse

At a distance of 0.5 ft. below the skeleton a patch of dark material was reached, consisting for the most part of burnt mould. This was found to extend to a depth of 7.5 ft. below the surface of the silting. The deposit was more or less in the shape of a mound of about 3 ft. in diameter, and it was evident that a fire had been kindled on the spot. The dark area was divided by a seam of 0.2 ft. of mixed mould and fine chalk at about 0.75 ft. from the top of the dark patch. Below the dark material yellowish-brown mould occurred, followed at a greater depth by chalk rubble.

¹ A similar ball, not quite spherical, about 2 in. in diameter, was found at Grime's Graves in 1914 (see *Grime's Graves Report*, 1915, 210).

In this dark material the following objects were found (marked no. 247):

- (a) Part of a large flint hammerstone (pp. 141, 144).
- (b) A large quantity of burnt animal bone, mostly split up into small pieces.
- (c) A human incisor tooth (mentioned below).
- (d) Astragalus of small ox.
- (e) Points of four tines of red deer, much weathered.
- (f) Metatarsus of red-deer (in bad state of preservation).
- (g) Fifteen flint flakes, of which eight were burnt (p. 145).
- (h) Charcoal (p. 159).

XX. HUMAN REMAINS FOUND IN THE FOSSE AT AVEBURY

<i>Cat. no.</i>	<i>Description.</i>	<i>Cutting.</i>	<i>Deposit in which found.</i>	<i>Depth below surface.</i>
30	Part of lower mandible of adolescent, with two molars.	I	Chalk rubble	8.3 ft.
34	Greater part of left clavicle.	I	Mixed silting	5.7 ft.
87	Part of parietal bone.	I	Chalk rubble	12.0 ft.
100	Part of right temporal bone (petrous and mastoid portions). ^a	I	Ditto	7.0 ft.
103	Part of left fibula, probably of a young female. ^b	I	Ditto	8.8 ft.
113	Greater part of clavicle.	I	Fine mixed silting	8.5 ft.
117	Part of femur and humerus.	II	Ditto	9.0 ft.
122	Part of femur and radius.	II	Ditto	7.9 ft.
169	Part of left humerus and left tibia. ^c	VIII	Mixed silting	4.5 ft.
191	Symphysial part of mandible of a man. ^d	IX	Fine mixed silting	—
212	Parts of mandible of a man. ^e	IX	Mixed silting	6.2 ft.
214	Human skeleton, etc., found in 1914 and described on pp. 145-6.	IX	Ditto	5.8 ft.
217	Part of small mandible, probably female. ^f	IX	Ditto	6.8 ft.
222	Part of right side and body of a mandible. ^g	IX	Ditto	6.3 ft.
247	Burnt material, etc., described on pp. 147-8, and including a human incisor tooth.	IX	Ditto	About 7 ft.
278	Fragment of cranium, piece of lower mandible and fragments of bones of fore-arm.	IX	Ditto	6.3 ft.

^a Dr. William Wright, F.S.A., thinks it is that of a female adult, the extreme smallness of the mastoid process being due to sex.

^b Identified by Dr. W. Wright.

^c Tibia (small): Antero-posterior diameter 30 mm., transverse diameter of the shaft 21 mm., latitudinal index 700.

^d Height at symphysis 30 mm.; no teeth remaining; in a weathered condition. 'Its chief feature is the breadth and strength of the chin' (W. Wright).

^e Somewhat weathered, like the other fragments of lower jaws, nos. 191, 217, and 222, as if they had been exposed on the surface at some time. 'There is nothing noteworthy about this mandible unless it be that the age of the individual was probably from 35 to 45 years of age' (W. Wright).

^f It consists of chin and part of the right side, weathered. 'It probably belonged to a female, and the chin, with allowances for the sexual differences, has the same conformations as that of specimens nos. 191 and 214' (W. Wright).

^g The ascending ramus is missing; of the teeth only the first and third molars remain. 'The last molar is only slightly, if at all worn, and therefore probably the specimen came from an individual whose age was in the early twenties' (W. Wright).

XXI. PICKS OF RED-DEER ANTLER, AVEBURY

A total number of forty-six antler picks was discovered in the Avebury excavations, viz. two in the vallum cutting and forty-four in the fosse—all of them in the chalk rubble and nearly all found on or near the bottom. These (with the exception of no. 236) are marked in the Average Section, pl. XLIV. Only seven of the picks were found high up in the rubble (three of these are marked in the Average Section). No picks, be it noted, were found in the mixed silting or in the upper stratified layers.

In Cutting I the ten picks were found from a depth of 14 ft. to the bottom. In Cutting II the specimens (two) came from a depth of 16.5 ft. to the bottom. In Cutting VIII a pick was taken from a depth of 14.8 ft. and another from the floor of the fosse. In Cutting IX, where examples were plentiful (thirty), the highest was found near the side of the ditch, depth 8.3 ft., but the majority of them were close to or on the floor.

Several of the specimens showed signs of much wear, as described in detail elsewhere, and a fair proportion of them bore marks of fire especially in the position of the grip on the beam of the antler. Some of the best examples have been figured (pls. XLVII and XLVIII).

A large proportion of the picks (twenty-nine) was made from shed antlers, whilst five had been taken from slain deer. The other ten—fragmentary specimens—could not be definitely classified in this respect.

Mr. Horace W. Sandars, F.S.A., made allusion to the antler picks found in Cuttings I and II at Avebury in his paper 'On the Use of the Deer-Horn Pick in the Mining Operations of the Ancients' (*Archaeologia*, lxii, 121, 124). Mr. W. G. Clarke, who brought together records of finds of picks in his *Report on the Excavations at Grime's Graves*, 1914, does not mention those discovered at Avebury.¹

¹ The discovery of antler picks is by no means confined to sites dating from the late Neolithic and early Bronze Age. Specimens have occurred on Roman sites, as for instance Woodyates (? Vindogladia) and Viroconium (*Excavations in Cranborne Chase*, iii, 135; *Wroxeter Excavations*, 2nd report, 1913, pl. ix, fig. 2).

The Rev. A. C. Smith, in his large book on North Wilts., informs us that 'fragments of antler picks, the instruments with which the graves had been dug, have been found repeatedly in opening the barrows of North Wilts.'. A large number of antler picks were found in the prehistoric shafts at Maumbury Rings, Dorchester, which the writer excavated in 1908-13 (*Proc. Dorset N. H. & Archaeol. Soc.*).

Others were found at Knap Hill Camp, Alton Barnes, N. Wilts. (Devizes Museum). A good specimen from Avebury was exhibited by the Rev. Bryan King, vicar of Avebury, when the British Archaeological Association visited Avebury in 1880. Portions of antler picks—one piece being smoothed and charred at the handle-end—were found in the great artificial mound at Marlborough College (*Report M. C. Nat. Hist. Soc.*, vol. lxi, 1912, p. 25). About twenty antler picks were found in the Harrow Hill flint mines (*Sussex Archaeol. Coll.*, lxvii, 117, and pl. v). Similar implements have been taken from the flint mines at Spiennes, Mons, Belgium (*Stone Age Antiquities*, *Brit. Mus.*, 1926, p. 153).

But the flint mines of Grime's Graves and Cissbury have produced more specimens of these antler picks than any other places in Britain. At the Grime's Graves, excavated first by Canon Greenwell, the picks were all found in the galleries or in the filling of the shaft, below 17 ft. from the surface; the total number then discovered was seventy-nine. Much work has been done there since then, and readers are referred for further information to Mr. Clarke's *Report* and to *Proc. Preh. Soc. E. Anglia*, vol. ii, etc. No less than 244 antler picks were found in the excavations at Grime's Graves in 1914; 147 of the specimens had also been used as hammers. A fine example of an antler pick was found in Gallery 6, pit 1, and is figured in *P.P.S.E. Anglia*, vol. v, p. 110. There are at least four of these picks in Norwich Castle Museum, one with 'cut' handle and marks of fire. Others may be seen in the British Museum (*Stone Age Antiquities*, *Brit. Mus.*, 1926, 79-81).

The above is not of course, by any means, a complete list of sites where antler picks have been found.

DETAILS OF THE AVEBURY PICKS

CUTTING I.

86. Greater part of a pick made from a shed antler of red-deer, the bez-tine broken off. Parts of the brow-tine are very much polished, the rounded point broken. This was not resting on the bottom of the fosse, like nos. 89, 90, 91, 94, and 95, but at an approximate depth of 14 ft.

89. Massive pick, measuring 219 mm. in circumference just above the burr, and 183 mm. round the beam between the brow- and the bez-tines. The stump of the trez-tine is seen, and close to it the handle terminates in a smooth bevelled end. The long brow-tine displays a graceful curve ending in a smooth point. The bez-tine is seen only as a stump. This was also a shed antler.

Figured in pl. XLVII.

90. Fine specimen of a pick made from a large shed red-deer antler. Present length $22\frac{1}{2}$ in., maximum circumference to beam 140 mm. The brow-tine does not appear to have been utilized in this specimen, but is broken off short. The bez-tine is straight and at an angle of about 40° with the beam of the antler. The smooth rounded point bears evidence of considerable use. The stump of the trez-tine is rounded and very smooth. The end of the handle and the grip are much polished in places.

Figured in pl. XLVII.

91. Pick formed from a large shed antler of red-deer. The bez-tines and trez-tines have been broken off. The brow-tine, which is set at a very obtuse angle with the beam of the antler, is much worn down from prolonged use. Circumference of antler just above the burr 200 mm.

94. Greater part of a pick of red-deer antler; of average size, much damaged; the brow-tine bears evidence of use.

95. Pick formed from an average-sized antler of a slain red-deer. The brow- and bez-tines are poorly developed, and both were probably used together as a double pick. The rounded point of the bez-tine is in good condition.

131. Small shed antler with brow- and bez-tines broken. The more perfect parts show no signs of wear, and it is uncertain if this specimen was ever used as a pick; the head shows no signs of hammering. Depth 17-8 ft. on the bottom.

133. Fine antler of slain deer, which has evidently been used as a pick; the bez-tine remains only as a short stump, but both the brow- and the trez-tine show considerable evidence of use, the former having a smooth rounded point, the finely developed trez-tine not being worn down, but the tip is extremely smooth. The grip of the handle is also smooth, as in no. 90. The tool was also used for hammering on the side opposite to the brow-tine. Depth 17-8 ft. on the bottom.

Figured in pl. XLVIII.

135. Pick, the shed antler being now missing beyond and including the trez-tine. The brow-tine is complete, showing signs of wear at the rounded point; the bez-tine has been intentionally removed; the back of the burr bears indications of hammering. Found on the bottom of the fosse.

Figured in pl. XLVIII.

136. Pick (present length, $20\frac{1}{2}$ in.) bearing considerable indications of prolonged use, the brow-tine being worn down to a length of 3 in. The bez- and trez-tines remain only as stumps. The antler was shed. It is interesting from the fact that the base for a length of 4 in. from the burr is battered by hammering to a very considerable extent, and undoubtedly this tool had proved to be a most serviceable one. Found on the bottom of the fosse.

Figured in pl. XLVII.

CUTTING II.

124. Pick, worn out from prolonged use, very little now remaining of the brow-tine. The bez- and trez-tines exist as stumps. The pick shows signs of hammering in the usual position. The smooth grip remains in a damaged condition. The antler is a shed one with a heavy straight beam. Depth 18.8 ft., on the bottom of the fosse.

128. The greater part of the beam of an antler pick, the base deficient, the trez-tine remaining as a stump. Signs of hammering in the usual position. Depth 16.5 ft. in the chalk rubble, near the bottom.

CUTTING VIII.

175. Broken pick of shed red-deer antler; the bez- and trez-tines removed, the brow-tine broken; evidence of hammering is seen on the back of the burr. Depth 14.8 ft. in the chalk rubble, near the floor and close to the western margin of the cutting.

176. Broken pick formed from a shed antler of a large red-deer; maximum circumference of the beam between the two lower tines, 161 mm.; the brow-tine has its point missing; considerable evidence of hammering is seen on the back of the burr. With it was found part of a worked rib-bone, numbered 76A. Found on the bottom of the fosse on the west margin of the cutting.

Figured in pls. XLVII and XLVIII.

CUTTING IX.

189. Pick, well worn, consisting of the beam and burr of a shed antler, having only a very slightly developed indication of a bez-tine. The trez-tine has been reduced to a stump (more projecting than in the majority of the picks). The brow-tine has become much worn and broken. The implement has been smoothed at the handle-end. The most pronounced indication of wear is seen at the back of the beam, caused by hammering, which has reduced the thickness of the antler considerably in this position, and removed the burr. Total length 470 mm. (18½ in.). Found in the chalk rubble close to the causeway in the NW. part of the cutting, depth 8.3 ft. below the brink of the fosse.

Figured in pl. XLVII.

196. Part of a pick formed from a shed antler. The bez-tine remains as a fairly long stump; the brow-tine is broken but still bears traces of human work. The back of the head of the pick and the burr bear clear evidence of hammering. Length 344 mm. (13½ in.). Found in the chalk rubble in the W. part of the cutting, depth 9.8 ft. below the brink of the fosse on the E. side of the causeway.

208. Pick damaged at the handle-end, having the bez- and trez-tines reduced to stumps, and the brow-tine broken off. This pick was formed from a large antler of a slain deer. Its most interesting feature is the large cavity at the back of the beam and head, the result of considerable wear from hammering. Length 394 mm. (15½ in.). Found near the W. end of the cutting in the chalk rubble, depth 12.8 ft. below the brink of the fosse on the E. side of the causeway.

Figured in pl. XLVIII.

209. Base of a large antler of a slain deer, with pedicle 3 in. in length. The burr is much worn down and the bez-tine is indicated merely by a stump. A good part of the brow-tine remains, but it has been broken. Probably the remains of a pick. Found in the N. half of the cutting in the chalk rubble, depth 17 ft. below the brink of the fosse on the E. side of the causeway.

216. Part of a pick consisting of the beam of an antler, the trez-tine reduced to a stump. The burr, brow- and bez-tines broken off. At the back of the beam there are traces of a depression, the result of hammering. Found in the chalk rubble in the NW. quarter of the cutting close to the wall of the fosse, at a depth of 22 ft. below the brink.

219. Pick, almost complete, formed from a small shed antler having two tines, the upper one reduced to a stump and bearing slight traces of fire. The brow-tine has been considerably worn down by picking. The back of the burr has been broken off. Length 489 mm. ($19\frac{1}{4}$ in.). Found in the chalk rubble in the S. half of the cutting, depth 24.5 ft. below the brink of the W. end of the fosse.

Figured in pl. XLVII.

224. Part of a pick consisting of the beam with the trez-tine remaining as a stump. The back of the beam is much worn by hammering. Found in the chalk rubble in the S. half of the cutting, depth 25 ft. below the brink.

226. Pick, much damaged, consisting of a shed antler with brow-tine broken off; the bez- and trez-tines reduced to stumps, the latter bearing indications of fire. The back of the beam and head of the pick bear distinct evidence of its use as a hammer. Found in the chalk rubble at the W. end of the cutting, 25 ft. below the brink.

227. Pick, almost complete (shed antler), the brow-tine reduced in length by wear and fracture; the bez- and trez-tines reduced to stumps; the latter and the handle-end are blackened in parts by the action of fire. There is evidence at the back of the head that the implement was also used as a hammer. Length 500 mm. ($19\frac{5}{8}$ in.); circumference of the beam 159 mm. Found in the N. half of the cutting on the bottom of the fosse, against the end-wall and 29.5 ft. below the brink.

Figured in pl. XLVII.

228. Pick, almost complete (shed antler), the brow-tine bearing indications of considerable wear; the bez- and trez-tines reduced to stumps. There is clear evidence of this implement having also been used as a hammer, like no. 227. Length 474 mm. ($18\frac{7}{8}$ in.). Found in the NW. corner of the cutting on the bottom of the fosse, against the end wall and 29.5 ft. below the brink.

Figured in pl. XLVII.

229. Greater part of a much-worn pick formed from a shed antler. The brow-tine is much shortened by wear and fracture; the bez- and trez-tines reduced to stumps. This implement was largely used as a hammer and there is a deep cavity at the back of the beam penetrating one-half of its diameter; the burr has also been broken away by hard wear. Length 350 mm. ($13\frac{3}{4}$ in.). Found at the W. end of the cutting against the end wall, on the bottom of the fosse, depth 29.3 ft. below the brink.

Figured in pl. XLVII.

230. Pick formed from a large antler of a slain deer with pedicle, the burr much worn down at the back. The large brow-tine has been reduced in length by wear and the 'tip' is now quite blunt; the bez- and trez-tines have been shortened in the usual manner. Indications of fire are noticeable near the burr, at the base of the bez-tine, and at the handle-end. Length 521 mm. ($20\frac{1}{2}$ in.); minimum circumference of the beam 165 mm. Found at the W. end of the cutting against the end wall, on the bottom of the fosse, 29 ft. below the brink.

Figured in pl. XLVIII.

234. Part of a pick formed from a shed antler, the handle-end missing. The greater part of the brow-tine remains and bears indications of wear; the bez- and trez-tines reduced to stumps. The condition of the back of the beam and burr indicates that the pick, as in most other instances, was also used as a hammer. Found in the chalk rubble in the N. half of the cutting, depth 20.5 ft. below the brink.

235. Pick, much damaged and in a very fragile condition (*not preserved*). Found close to no. 234, and at the same depth.

236. The greater part of the beam of an antler, bearing traces of fire, and perhaps part of a pick. Found at the W. end of the cutting, depth 25.5 ft. below the brink.

237. Pick formed from a large shed antler having the burr partly removed. The brow-tine is nearly complete, the tip in places being smooth from wear; the bez- and trez-tines reduced to stumps. Length 467 mm. ($18\frac{3}{8}$ in.); circumference of the beam between bez- and trez-tines 170 mm. ($6\frac{3}{4}$ in.). Found in the chalk rubble in the S. half of the cutting, 16.5 ft. below the brink.

Figured in pl. XLVIII.

261. Greater part of the beam of an antler, the stumps of the intentionally removed bez- and trez-tines remaining. The base of the antler and the brow-tine were not found; they were evidently broken off owing to prolonged use of this pick as a hammer also; the specimen shows considerable evidence of hammering. Found in the N. half of the cutting near the middle of the silting, depth 21 ft.

263. Pick, small but well worn, consisting of the beam and burr of a shed antler. The bez- and trez-tines are reduced to stumps, and the brow-tine is partly broken off. The back of the base of the antler and the burr bear clear evidence of wear. Found in the middle of the cutting, depth 27.5 ft.

265. Pick in fairly good condition, having the brow-tine remaining and the bez- and trez-tines reduced to stumps. The brow-tine has become shortened by wear and its 'tip' is now quite blunt. The handle-end bears traces of fire. Length 442 mm. ($17\frac{3}{8}$ in.). Found in the middle of the cutting on the bottom of the fosse, depth 28.5 ft.

266. Pick of large dimensions; length from burr to end of handle 503 mm. ($19\frac{3}{4}$ in.). The brow-tine, smooth at the tip, is of graceful form, length 340 mm. ($13\frac{3}{8}$ in.) on the outer curve. The bez- and trez-tines have been considerably cut down. The smoothed handle bears indications of fire in two places. Minimum circumference of beam between bez- and trez-tines, 153 mm.; circumference just above the burr 200 mm. Found in the N. half of the cutting near the W. end, on the bottom of the fosse, depth 29.5 ft.

Figured in pl. XLVII.

271. Pick, having the burr completely worn away and the brow-tine largely reduced by constant use. One tine has been completely removed; the beam of the antler is smoother than is generally the case. The crown of two points has been left to form a termination to the handle of the pick; these points are also a good deal polished by wear; they may also have been used for levering purposes. Length 522 mm. ($20\frac{1}{2}$ in.). Found near the middle of the cutting, on the bottom of the fosse, depth 24 ft.

Figured in pl. XLVIII.

273. Pick, small but fairly complete, except at the handle-end. The brow-tine has, however, been shortened by fracture. Found on the bottom of the fosse, depth 24 ft.

Figured in pl. XLVII.

274. Pick, small and incomplete, with the whole of the brow-tine deficient. Part of the burr has been removed. Found near the bottom of the fosse, depth 19.5 ft.

275. Beam of a large antler, without any trace of the burr or brow-tine now remaining. The handle-end is extremely smooth—more polished than the great majority of the Avebury specimens. Probably the remains of a pick. Found within 3 in. of the bottom of the fosse, in the N. half of the cutting.

276. Greater part of a pick, having the brow-tine set very obtusely to the line of the beam of the antler. The bez- and trez-tines have been removed; also part of the burr; handle-end broken. Found near the E. end of the cutting, depth 22 ft.

277. Pick, length 431 mm. (17 in.). The brow-tine is worn down to a rounded point, the result of considerable use. The bez- and trez-tines have been removed. The handle-end shows some signs of wear. The most pronounced indication of wear, however, is seen at the back of the beam and round the burr, caused by hammering. Found near the E. end of the cutting, depth 19.5 ft.

Figured in pl. XLVII.

In addition to the above, four much broken and decayed antler picks (or parts) were found in the chalk rubble at an average depth of 12 ft. below the surface of the silting.

CUTTING X (Vallum).

184. Greater part of a small shed antler, red-brown colour. There is no positive evidence that this specimen was a pick, as the brow-tine is broken and the other tine some way up the beam has not been shortened; but the end of the beam nearest the crown has been burnt in a similar manner to some of the handle-ends of more definite picks. Found in the chalk rubble in the body of the vallum, depth 4 ft. below the surface.

232. Part of a small pick formed from a shed antler having a rudimentary bez-tine; the brow-tine was badly fractured at the time of its discovery, but the point is worked and very smooth. Found in a slight 'mound' of mould (probably decayed turf), 0.2 ft. above the old surface under the crest of the vallum.

XXII. OBJECTS OF RED-DEER ANTLER, AND PIECES OF ANTLER UNWORKED

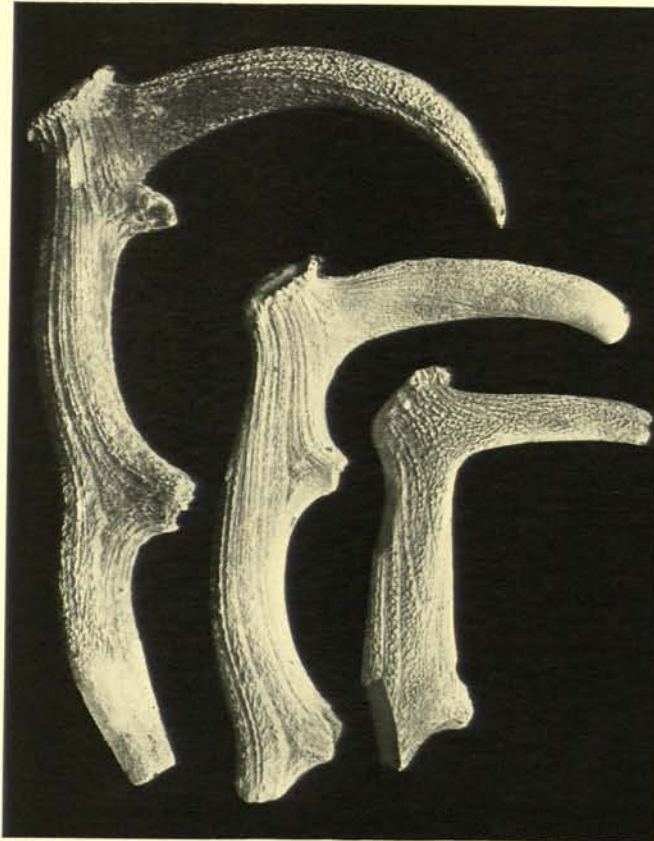
All from Fosse, except those from Cutting X, which are Vallum.

<i>Cat. No.</i>	<i>Description.</i>	<i>Shed or slain.</i>	<i>Cutting.</i>	<i>Deposit in which found.</i>	<i>Depth below surface.</i>	<i>Reference to illustrations.</i>	<i>Museum in which preserved.</i>
86	Pick	Shed antler	I	Chalk rubble	14 ft.		P. R. Museum, Oxford
89	Pick	Do.	I	Do.	Fosse bottom	pl. XLVII	Devizes
90	Pick	Do.	I	Do.	Do.	pl. XLVII	Do.
91	Pick	Do.	I	Do.	Do.		Do.
94	Pick	—	I	Do.	Do.		Abingdon Museum
95	Pick	Slain deer	I	Do.	Do.		Devizes
88	Pieces or part of antler	—	I	Do.	12.5 ft.		Do.
92	Pieces or part of antler	Shed antler	I	Mixed silting	5.7 ft.		Do.
131	Pick	Do.	I	Chalk rubble	Fosse bottom (17.8 ft.)		Do.
133	Pick	Slain deer	I	Do.	Do. (17.8 ft.)	pl. XLVIII	Do.
135	Pick	Shed antler	I	Do.	Fosse bottom	pl. XLVIII	P. R. Museum, Oxford
136	Pick	Do.	I	Do.	Do.	pl. XLVII	Somerset County Museum
124	Pick	Do.	II	Do.	Do. (18.8 ft.)		Devizes
128	Pick	—	II	Do.	16.5 ft.		Do.
121	Pieces or part of antler	—	II	Mixed silting	8 ft.		Do.
127	Pieces or part of antler	—	II	Chalk rubble	10.2 ft.		Do.
149	Pieces or part of antler	—	VIII	Mixed silting	6 ft.		Do.
160	Pieces or part of antler	Shed antler	VIII	Do.	7 ft.		Do.
164	Pieces or part of antler	—	VIII	Do.	8 ft.		Do.
170	Pieces or part of antler	Shed antler	VIII	Chalk rubble	Fosse bottom		Do.
172	Rake	—	VIII	Do.	Do.	pl. XLVIII	Do.
173	Piece, <i>roe-deer</i>	—	VIII	Mixed silting	5 ft.		Do.
174	Small antler of young red-deer	—	VIII	Do.	5.5 ft.		Do.
175	Pick	Shed antler	VIII	Chalk rubble	14.8 ft.		Newbury Museum
176	Pick	Do.	VIII	Do.	Fosse bottom	pls. XLVII, XLVIII	British Museum
183	Pieces or part of antler	—	IX	Mixed silting	—		Devizes
188	Pieces or part of antler	—	IX	Do.	7.3 ft.		Do.
189	Pick	Shed antler	IX	Chalk rubble	8.3 ft.	pl. XLVII	P. R. Museum, Oxford
196	Pick	Do.	IX	Do.	9.8 ft.		Salisbury Museum
208	Pick	Slain deer	IX	Do.	12.8 ft.	pl. XLVIII	British Museum
209	Pick	Do.	IX	Do.	17 ft.		Devizes
213	Pieces or part of antler	—	IX	Mixed silting	—		Do.
215	Pieces or part of antler	Shed antler	IX	Do.	8.7 ft.		Do.
216	Pick	—	IX	Chalk rubble	22 ft.		Do.
218	Rake	—	IX	Do.	18 ft.		Do.

266

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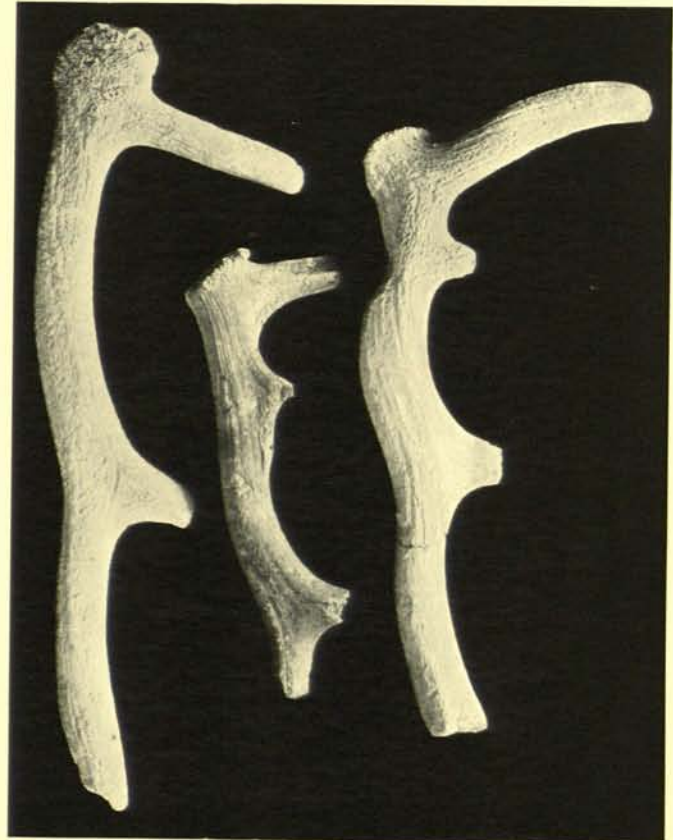
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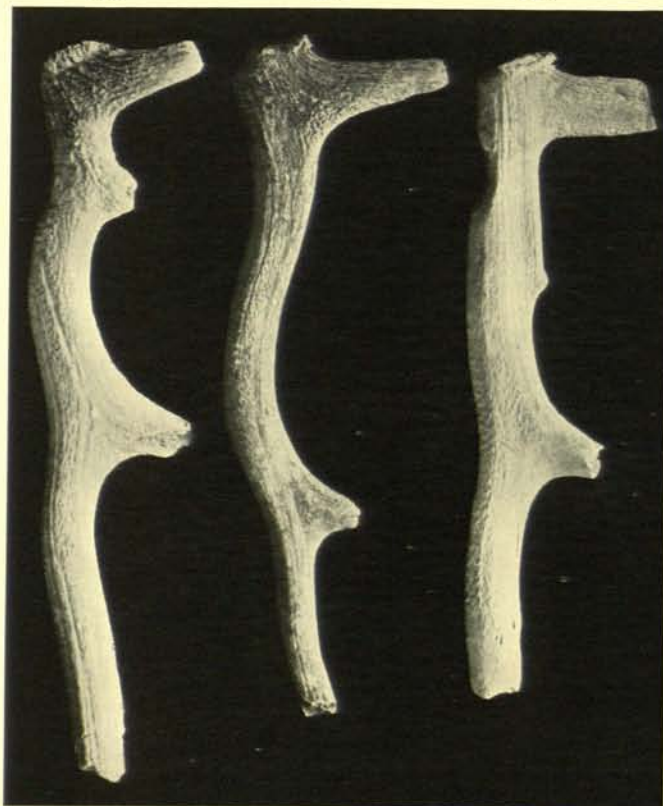
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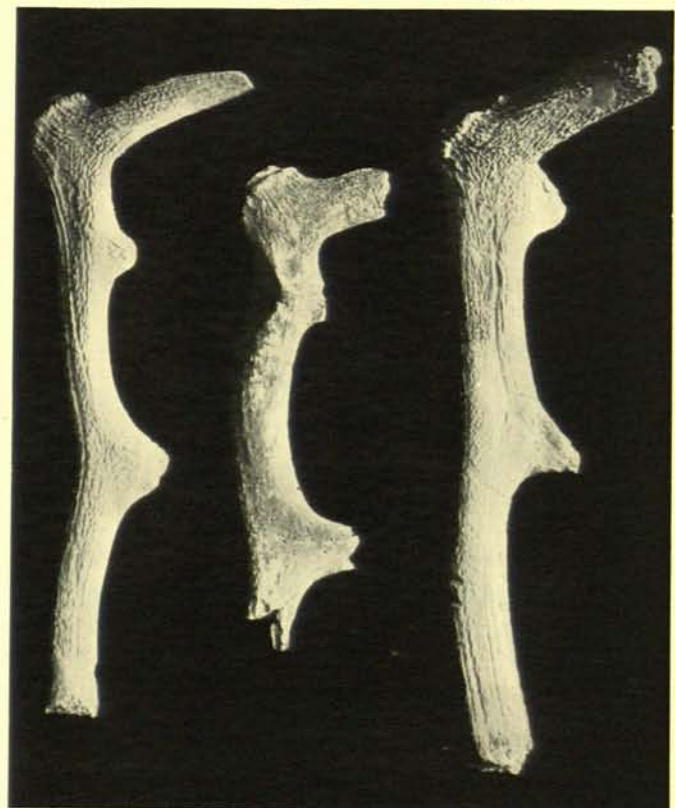
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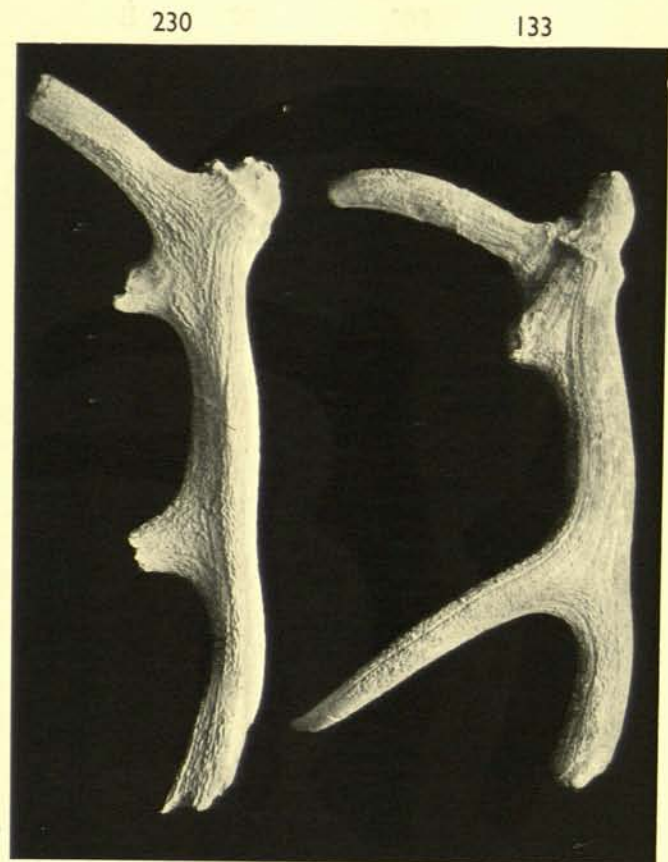
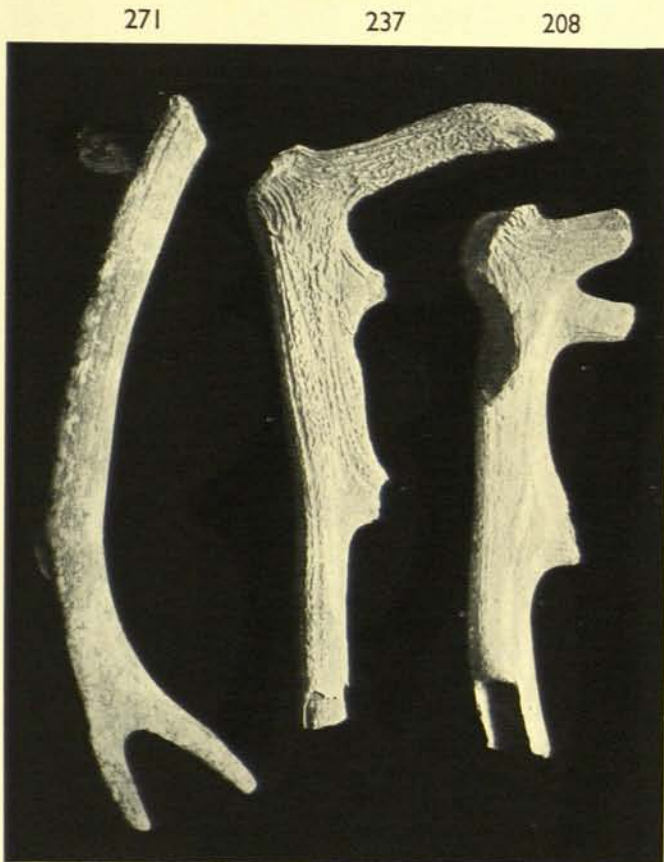
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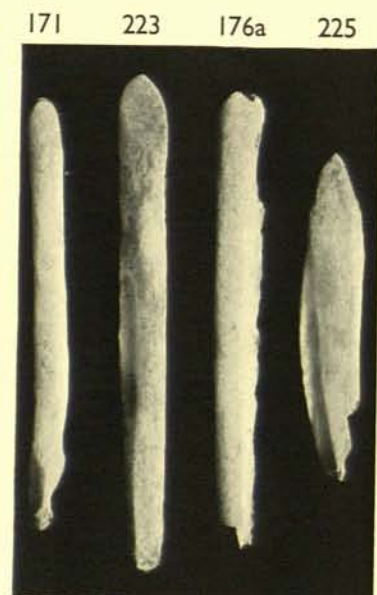
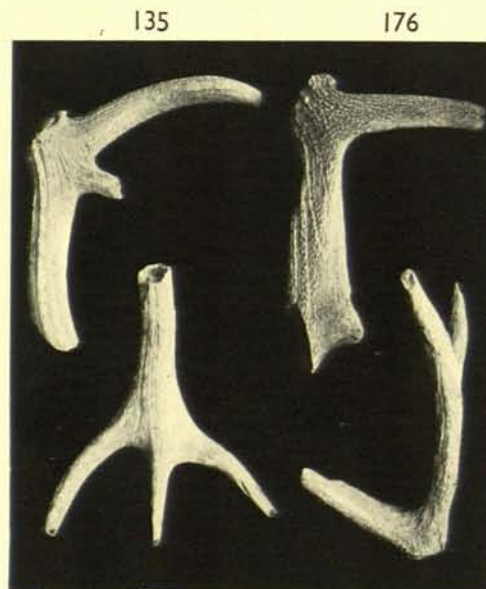
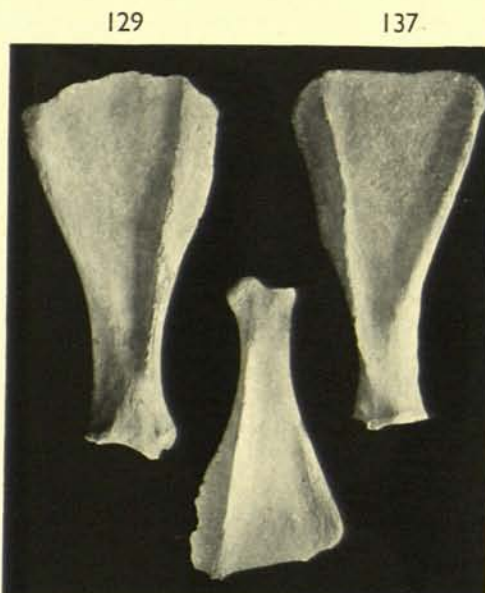
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Antler Picks found in the Fosse at Avebury



Antler Picks found in the Fosse at Avebury



145

172

259

Picks and Rakes of Antler, worked Shoulder-blades (Shovels), and other bone implements, found in the Fosse at Avebury

<i>Cat. No.</i>	<i>Description.</i>	<i>Shed or slain.</i>	<i>Cutting.</i>	<i>Deposit in which found.</i>	<i>Depth below surface.</i>	<i>Reference to illustrations.</i>	<i>Museum in which preserved.</i>
219	Pick	Shed antler	IX	Chalk rubble	24.5 ft.	pl. XLVII	Salisbury Museum
224	Pick	—	IX	Do.	25 ft.		Devizes
226	Pick	Shed antler	IX	Do.	25 ft.		Marlborough Coll.
227	Pick	Do.	IX	Do.	Fosse bottom (29.5 ft.)	pl. XLVII	Do.
228	Pick	Do.	IX	Do.	Do.	pl. XLVII	P. R. Museum, Oxford
229	Pick	Do.	IX	Do.	(29.5 ft.)	pl. XLVII	H. Drutt Museum, Christchurch
230	Pick	Slain deer	IX	Do.	(29.3 ft.)	pl. XLVIII	British Museum
234	Pick	Shed antler	IX	Do.	(29 ft.)		
235	Pick (<i>not preserved</i>)	—	IX	Do.	20.5 ft.		Somerset County Museum
236	Pick	—	IX	Do.	25.5 ft.		—
237	Pick	Shed antler	IX	Do.	16.5 ft.	pl. XLVIII	Devizes
239	Pieces or part of antler	Do.	IX	Do.	Fosse bottom (29 ft.)		British Museum
—	Pick	—	IX	Do.	12 ft.		Devizes
—	Pick	—	IX	Do.	12 ft.		Do.
—	Pick	—	IX	Do.	12 ft.		Do.
—	Pick	—	IX	Do.	12 ft.		Do.
—	Pieces or part of antler	—	IX	Do.	Fosse bottom		Do.
247	Pieces or part of antler	—	IX	Mixed silting	7.5 ft.		Do.
259	Crown (? rake)	—	IX	Chalk rubble	27.5 ft.	pl. XLVIII	Do.
260	Pieces or part of antler	—	IX	Do.	20 ft.		Do.
261	Pick	Shed antler	IX	Do.	21 ft.		Do.
262	Pieces or part of antler	—	IX	Do.	27.3 ft.		Do.
263	Pick	Shed antler	IX	Do.	27.5 ft.		Do.
264	Pieces or part of antler	—	IX	Do.	27.5 ft.		Do.
265	Pick	Shed antler	IX	Do.	Fosse bottom (28.5 ft.)		Newbury Museum
266	Pick	Do.	IX	Do.	Do.	pl. XLVII	Devizes
267	Crown (? rake)	—	IX	Do.	(29.5 ft.)		
268	Crown (? rake)	—	IX	Do.	Do.		Somerset County Museum
271	Pick	Shed antler	IX	Do.	(29 ft.)		Devizes
272	Crown (? rake)	—	IX	Do.	27 ft.	pl. XLVIII	Do.
273	Pick	Shed antler	IX	Do.	Fosse bottom (24 ft.)		
274	Pick	Do.	IX	Do.	Fosse bottom (24 ft.)	pl. XLVII	Do.
275	Pick	Do.	IX	Do.	Do.		Newbury Museum
276	Pick	Do.	IX	Do.	19.5 ft.		Devizes
277	Pick	Do.	IX	Do.	Fosse bottom		Do.
181	Crown (? rake)	—	X	Body of Vallum	22 ft.	pl. XLVII	Do.
184	Pick	Shed antler	X	Do.	19.5 ft.		Do.
232	Pick	Do.	X	—	3.4 ft.		Do.
253	Pieces or part of antler	—	X	Body of Vallum	4 ft.		Do.
					O.T.L.		Do.

XXIII. THE AUCISSA FIBULA, AVEBURY

A fibula of bronze, no. 162, Roman, first century A.D., was found in the fosse near the western margin of Cutting VIII, depth 3.9 ft. and at the top of the mixed silting¹ (fig. 8).

It has a semicircular bow of plano-convex section, the rounded upper surface being

¹ There is no doubt about the finding of this fibula in this position, as it was picked up by the writer when closely watching the excavators digging at this level.

ornamented longitudinally by a beaded pattern of the character usual in brooches of this type. The nose, consisting of a knob, appears to have been broken and replaced by a moulded knob of a different metal. The pin is hinged, with an iron axis. The

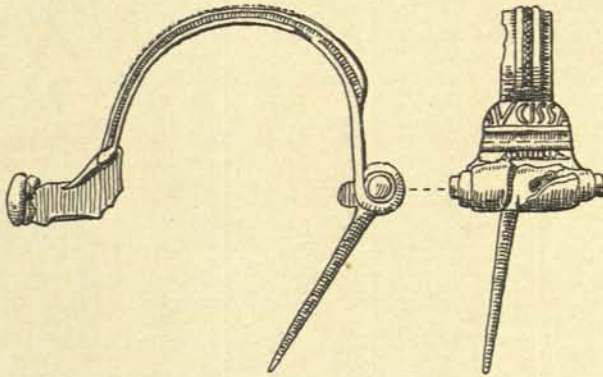


Fig. 8. Bronze fibula, inscribed 'Aucissa', found in the Fosse, depth 3.9 ft., Cutting VIII, Avebury. $\frac{1}{2}$.

head of the bow terminates in a plate bearing the inscription AVCISSA;¹ length 49.5 mm. (nearly 2 in.).

This type of brooch, without inscription, is not rare, and has been found in many parts of the Roman Empire north of the Mediterranean, and outside it, including the Caucasus and Tomsk in Siberia. It seems to have been commonest in the first half of the first century A.D., and dates in Eastern Gaul from B.C. 10 to A.D. 50. The late Professor Haverfield had up to 1905 listed and recorded twenty-eight fibulae bearing the name AVCISSA, including six from Britain, namely, two found about 1875

in the Roman lead-workings at Charterhouse-on-Mendip, Somerset (Capper Pass Collection, Bristol Museum),² two others found at Cirencester (one in the Bathurst Museum there, the other in the Cripps Museum),³ and two found presumably in a Roman cemetery at South Ferriby, Lincolnshire (bought for Hull Museum in 1905).⁴

In 1906 the writer exhibited at the Society of Antiquaries another specimen, found at Tor Point Quarry on Ham Hill, South Somerset, in 1905. This brooch has been figured, and it will be seen that the S's in the inscription are reversed.⁵ Subsequently the bow of another fibula with 'Aucissa' in relief was found on Ham Hill.⁶ The site has also produced three or four similar brooches without inscription.⁷

Another Somerset specimen bearing the name was found on a site rich in Roman remains at Charlton, Shepton Mallet, in 1917.⁸ This specimen, which is exhibited in the museum at Shepton Mallet, has the pin missing, and is damaged at the hinge. Its length is 47 mm.; height 24 mm.

In Wiltshire an inscribed 'Aucissa' fibula was found at Mildenhall, near Marlborough, in 1910, and was to be seen in the J. W. Brooke Museum in that town (now

¹ 'Aucissa' is very rarely met with on Roman pottery. One piece bearing the name was found in Paris over a century ago.

² *Arch. Journ.*, lx, 240 (figured); *Ephemeris Epigraphica*, ix, 661; *Vict. Co. Hist. Som.*, i, 343 (figured); *The Connoisseur*, August 1918, li, 221 (one figured).

³ *Arch. Journ.*, lxii, 265.

⁴ *Ibid.*, 265-6 (figured); *Hull Museum Publications*, xv, Dec. 1905 (figured).

⁵ *Proc. Soc. Antiq. Lond.*, xxi, 131; *Proc. Som. Arch. Soc.*, lvi, ii, 56 (figured); *The Connoisseur*, li, 221 (figured).

⁶ *The Antiquaries Journal*, iii, 150.

⁷ One figured in *Proc. Som. Arch. Soc.*, li, 146. A good specimen of the type was found with human remains in Coronation Road, near St. John's Church, Weston-super-Mare, and may be seen in the Museum in that town.

⁸ Figured by the writer in *The Connoisseur*, li, 221.

in the Devizes Museum).¹ Another comes from Roman Wanborough in North Wilts., and has been figured.²

The excavations at Wroxeter produced one fibula inscribed 'Aucissa', but the initial 'A' has been broken off. It was found in 1912 in connexion with pottery belonging to the period A.D. 80-120. This is perhaps the latest 'dated' example that has been recorded.³

A fine example of an inscribed Aucissa fibula of bronze was found in the excavations at Richborough in 1931.⁴ Another inscribed specimen was found at Alchester (Oxon.) in 1928.⁵

XXIV. ANIMAL REMAINS FOUND AT AVEBURY⁶

Apart from the antler picks and other tools of bone and antler little in the way of animal remains was found in the chalk rubble in the great fosse; but above that level bones were fairly numerous especially in the upper, or post-Roman strata. For the most part they were the remains of young animals, the epiphyses being detached.

The animals represented are:—Horse, Ox, Sheep, Pig, Dog, Red Deer, Roe Deer, Common Fox, Mole, Frog, Toad, and Common Fowl.

The following are the details which were collected:

HORSE. The Horse remains, for the most part belonging to small animals, included several teeth in Cutting I, but they extended to a depth of only 7 ft.

Three more teeth were found in the Roman strata of Cutting III, at a depth of 9.5 ft.

Ox. Remains of Ox were comparatively numerous and 'evidently belong to a larger and a smaller race; the latter may be the long-faced Ox, *Bos taurus* var. *longifrons*' (E. T. Newton, F.R.S.).

In Cutting I the Ox was traceable down to a depth of 9 ft. in the *chalk rubble*, and remains apparently belonging to one animal were found at a depth of 8.8 ft.; astragali and digits were fairly plentiful.

The relative size of the bones varied considerably; a tibia found at a depth of 5.5 ft. gives a height for the animal of 3 ft. 2 in., whereas a complete metacarpus (depth 6.5 ft.) gives a height of only 3 ft. $\frac{3}{4}$ in.; from a metacarpus (depth 6.8 ft.) a height of 3 ft. $5\frac{1}{2}$ in. was estimated. Worked shoulder-blades (*scapulae*) and other worked bones are dealt with elsewhere.

In Cutting II a tooth was found at 6.5 ft., and two digits at 7 ft. At 7.5 ft. in the Roman stratum a metacarpus (length 240 mm.), giving an estimated height of 4 ft. 9 in., was discovered. There were also, in the Roman stratum, depth 6.3 ft., a humerus, and at 9.5 ft. in the Bronze Age stratum, a tibia with ends missing. Mr. Newton identified part of a radius of a young animal, depth 18.5 ft., on the bottom of the fosse.

In Cutting III an astragalus was uncovered in the Roman stratum, depth 9.5 ft.; another was discovered with find no. 247 in the fosse, Cutting IX. This cutting also yielded the lower end of a femur of Ox (no. 234), found on the bottom of the fosse.

¹ *Cat. Devizes Museum*, pt. ii (2nd edit.), 1934, p. 222, and pl. lxxii, fig. 8.

² *Wilts. Arch. Mag.*, xli, plate facing p. 279, no. 3.

³ Figured and described in the *Wroxeter Report*, i (1913), p. 24, no. 5.

⁴ Will be figured in the Fourth Report on Richborough (Soc. of Antiquaries).

⁵ *Antiq. Journ.*, xii (1932), p. 64, and pl. xvii, 8d.

⁶ This section has been read by Dr. J. Wilfrid Jackson, F.G.S.

In the mixed silting, Cutting VIII, a large humerus of Ox was found, with other fragmentary remains apparently of the same animal, depth 7.7 ft.

In Cutting X, vallum, the lower end of a femur of Ox (no. 233) was found on the old turf line. The shaft of a tibia (no. 232), the heads broken off at both ends as if for the extraction of marrow, was found near the old turf line. In the chalk rubble, at a depth of 4 ft., part of a radius and other remains of Ox were found (no. 179), and at 4.25 ft. the greater part of a tibia of young Ox (no. 185), the shaft split obliquely—perhaps for the extraction of marrow.

SHEEP. In Cutting I, fosse, remains of Sheep, including jaws, were found down to a depth of 6 ft. A metacarpus was obtained at a depth of 3.5 ft.

A scapula was found in Cutting III at a depth of 18 ft., in the chalk rubble.

With find no. 214 a metacarpus of sheep was found, length 138 mm., least circumference 48 mm.; estimated height of animal, 2 ft. 2 in.

FIG. Mr. E. T. Newton said there was nothing to suggest wild forms.

In Cutting I, fosse, most of the Pig teeth were found in the upper deposits; the lowest depth, however, was 13 ft. (in chalk rubble).

In the fine mixed silting, Cutting VIII, depth 7 ft., a small tusk of Boar was found. In this cutting a few very fragmentary animal bones were found on the bottom of the fosse, among which Pig was recognized.

Four teeth of Pig were found on the old turf line, Cutting X, vallum.

DOG. One or two of the bones under this heading may be Wolf, but this is uncertain. The remains varied considerably in size. This was firstly noticed in Cutting I, fosse, where lower jaws, etc., were found, not deeper than 8.8 ft.

In Cutting II the shaft of a femur of small Dog was found in the chalk rubble.

In Cutting III a lower jaw, rather smaller than a Retriever, was obtained from a depth of 4.5 ft. in the surface silting.

Cutting VIII produced a Dog's jaw in the fine mixed silting, at a depth of 7 ft.

One side of lower jaw of Dog (no. 238) and a number of teeth belonging to the other side also, about the size of a Retriever, were found on the bottom of the fosse, Cutting IX, and near by several teeth of Dog of similar size were uncovered.

RED DEER. In Cutting I, fosse, the Red Deer was represented, in addition to the antler picks (described elsewhere), by an astragalus, os calcis, teeth, and small parts of lower jaws; the largest of the latter, however, was at a depth of only 2.5 ft. in the surface silting.

In Cutting II part of a metacarpus, depth 9 ft., was found.

In Cutting III a digit was recorded at a depth of 11.5 ft. in the mixed silting.

Cutting IX, fosse, produced some interesting specimens. A metatarsus, much broken, was included with find no. 247. No. 250 represented another metatarsus, length 315 mm. ($12\frac{1}{4}$ in.), least circumference 81 mm., found at a depth of 8 ft. A Red Deer at the Royal College of Surgeons, having a metatarsus $10\frac{3}{4}$ in. in length, stands $44\frac{1}{4}$ in. at the withers. The Avebury stag, therefore, probably stood over 49 in. at the withers.

Part of a metacarpus (no. 249) was found at a depth of 6.5 ft.; and another specimen, complete, length 274 mm., least circumference 78 mm., was found in the Roman stratum.

The occipital portion of a skull, with height from the basion to supra-occipital crest 89 mm. (no. 246), was found in the chalk rubble at a depth of 11 ft.

The antler picks and other pieces of Red-deer antler have been listed and described elsewhere (see pp. 148-155).

ROE DEER. In Cutting I a fragment of antler, probably of Roe-buck, was found.

In Cutting VIII, fragment of the base of an antler of Roe Deer (no. 173) was found at a depth of 5 ft. in the mixed silting.

COMMON FOX. Part of a maxilla with molars, found in Cutting I, depth 3.5 ft.; also two canine teeth.

MOLE. Scapula and sternum, Cutting II, identified by Mr. E. T. Newton.

COMMON FROG. Frog remains from Cutting I (E. T. N.).

TOAD. Ilium from Cutting II (E. T. N.).

COMMON FOWL. Part of tibia, Cutting I (E. T. N.).

XXV. CHARCOALS FROM THE AVEBURY EXCAVATIONS

Identified by Mr. J. CECIL MABY, B.Sc., unless otherwise stated.

FOSSE

Cutting I.

From the bottom of the fosse, with a piece of burnt flint; *Alnus* or *Corylus* sp., too splintered for certainty; only fragment available looked most like Hazel, not Alder.

Cutting VIII.

Two patches of dark mould with evidence of burning were recorded, one at 5 ft. deep, the other at 7.2 ft.; charcoal was collected in both deposits.

From the bottom of the fine mixed silting in the middle of the fosse; *Corylus* sp., presumably Hazel; young wood, several pieces.

From the bottom of the fine mixed silting resting on the surface of the agglutinated chalk rubble; *Rhamnus* sp. (?), apparently Buckthorn, but just possibly Hazel; young wood; 'knotty'.

Found deep in the chalk rubble; *Alnus* or *Corylus* sp., probably Alder rather than Hazel; young wood.

From another box of charcoal obtained here (position not preserved) the following identifications were made: *Aesculus* sp., presumably Horse Chestnut, *Corylus* sp. (?), Hazel (?); too poor and small for certainty; several fragments. *Crataegus* sp., presumably Hawthorn; just possibly might be abnormal *Pyrus* sp. (Apple, Pear, Rowan, etc.): several fragments.

Cutting IX.

Found with the burnt material, no. 247, depth 6 to 7 ft.: *Taxus* sp., presumably Yew, but just possibly Juniper (*Juniperus* sp.). A Conifer; narrow rings; several pieces. *Rhamnus* sp., presumably Buckthorn; several fragments.

Found in the mixed silting against the south 'wall' of the fosse: *Alnus* or *Corylus* sp., presumably Alder or Hazel; most resembled Alder; several fragments.

A little charcoal was also found in the chalk rubble, depth 12 ft. below the surface, and another piece deep in the chalk rubble, identified by the late Mr. Clement Reid, F.R.S., as Hazel.

At the bottom of the yellowish-brown mould, depth 6.8 ft., charcoal was collected, which the late Mr. A. H. Lyell, F.S.A., identified as Hornbeam (*Carpinus betulus*, L.). This was in close association with Beaker pottery (found 3 in. higher). This Hornbeam must date, therefore, from at least as far back as the earliest years of the Bronze Age.

In excavations at Ham Hill Camp, South Somerset, the writer found a large quantity of Hornbeam in one mass in Cutting X, depth 9.5 ft., and it was identified by Mr. Lyell. This was regarded as an important record, being found below the Roman remains at 'Ham Turn', and in deposits in which objects of the earlier part of the prehistoric Iron Age were discovered (*Proc. Som. Arch. Soc.* lxxii, 1926, pp. 67-8).

In the *Journal of Ecology* (vol. xii, no. 1, Jan. 1924), the late Mr. Miller Christy issued

a valuable paper on the Hornbeam,¹ and he noted its discovery (p. 44) in excavations on Roman sites at Hengistbury Head, 1911-12, Wroxeter, 1914, and Hambledon (Bucks.), 1915. Hornbeam has also been found on the Neolithic and early Iron Age levels at the Trundle (*Sussex Arch. Coll.* lxxii, 147).

The discovery of the nuts of the Hornbeam in much earlier deposits, as Mr. Christy said, 'suffices to dispel any supposition that the tree was introduced by the Romans. . . . The tree has been accepted as indigenous by nearly all those writers on British forest trees who are best qualified to express an opinion.'

Hornbeam only occurs now in most places in Wilts. as a planted tree (*Flora of Wilts.*, by T. A. Preston, 1888, p. 274). Aubrey in *Nat. Hist. Wilts.*, p. 55, says, 'Hornbeam we have none'.

The Rev. R. P. Murray in *Flora of Somerset*, 1896, p. 301, says under Hornbeam, 'Alien, I think, in Somerset, wood and hedges, rare'. Planted and indigenous records are given by the Rev. E. S. Marshall in *Supplement to the Somerset Flora*, p. 166.

VALLUM

Cutting X.

Found, in some quantity, on the old turf line: *Crataegus* sp., presumably Hawthorn; several pieces. *Aesculus* sp., presumably Horse Chestnut; several pieces. *Corylus* sp., presumably Hazel; several pieces.

XXVI. REPORT ON THE NON-MARINE MOLLUSCA, AVEBURY

By A. S. KENNARD, A.L.S., F.G.S., and the late B. B. WOODWARD, F.L.S. (18 December, 1927)

Mr. H. St. George Gray kindly forwarded the molluscan remains found during the excavations and we are greatly indebted to him for the trouble he has taken. The series was not a large one, being practically all large shells, but by washing the contained earth some of the smaller forms were obtained.

FOSSE, CUTTING I, depth 6 ft.: *Xerophila itala* (Linn.); *Trochulus hispidus* (Linn.).

FOSSE, CUTTING II, depth 9.5 ft.: *Goniodiscus rotundatus* (Müll.); *Helicella pura* (Ald.); *Xerophila itala* (Linn.); *Arianta arbustorum* (Linn.); *Cepaea nemoralis* (Linn.); *Cepaea hortensis* (Müll.).

FOSSE, CUTTING VIII, depth 6.5 ft., from the fine silting in the middle of the fosse, below the Roman stratum: *Pomatias elegans* (Müll.); *Vallonia excentrica* (V. Sterki); *Cochlicopa lubrica* (Müll.); *Helicella nitidula* (Drap.); *Trochulus hispidus* (Linn.).

FOSSE, CUTTING VIII, from the chalk rubble: *Cepaea nemoralis* (Linn.).

FOSSE, CUTTING IX (1922), depth 6.3 ft., associated with human bones (no. 278), and near Beaker pottery (no. 279): *Pupilla muscorum* (Linn.); *Vallonia excentrica* (V. Sterki); *Arion* sp.; *Helicella pura* (Ald.); *Xerophila itala* (Linn.).

FOSSE, CUTTING IX, from the pre-Roman deposits (1914): *Pomatias elegans* (Müll.); *Carychium minimum* (Müll.); *Arion* sp.; *Goniodiscus rotundatus* (Müll.); *Helicella nitidula* (Drap.); *Vitrea crystallina* (Müll.); *Xerophila itala* (Linn.); *Trochulus hispidus* (Linn.); *Arianta arbustorum* (Linn.); *Cepaea nemoralis* (Linn.); *Cepaea hortensis* (Müll.).

¹ See also *Welsh Timber Trees*, by H. A. Hyde (Nat. Mus. of Wales, 1931), p. 63.

The faunules are probably of the same age, and they would appear to indicate damper conditions than now exist and a scrub growth. We have previously examined molluscan remains from Windmill Hill (near Avebury), Stonehenge, and Woodhenge. Of these the two latter series indicate downland conditions, whilst the shells from Windmill Hill are typical of much damper conditions, and we may therefore reasonably infer that, if not absolutely contemporaneous, Avebury and Windmill Hill belong to the same climatic period.

XXVII. CONCLUDING REMARKS

Little remains to be said in these concluding remarks, but perhaps a short summary of main facts should be given for those not wishing to read all the details.

The excavations have been worth while even if there had not been any other purpose in view than to ascertain the method of construction of the fosse—its great length (nearly three-quarters of a mile), enormous and varying depth, irregularity in width at the bottom, uneven floor, and its vast and unexpected proportions. The variations in the depth and width at the bottom were probably largely due to the nature of the chalk. The stratification of the silting of this ditch, which formed rapidly at the bottom, especially until the whole of the escarp and counterscarp became covered, is well defined, and is, archaeologically, of great educational value.

The vallum and fosse were apparently designed to enclose a sacred area. The ditch being on the inner side could not have been intended for defensive purposes. Similar features are met with in some of the other large circles, such as Arbor Low, Stennis, and the Stripples Stones. Presumably the vallum served as elevated ground from which spectators could watch ceremonies in progress within the circles, without being allowed to go closer.

The ancient entrance-causeway on the south, which passed between the two remaining stones of the Great Circle, has been located and partly exposed by excavation.¹ Had it been possible, in this particular exploration, it would have been interesting to ascertain if there is an entrance-causeway on the north (Swindon road), and also whether there is a western entrance; the existence of the latter would be difficult to prove by excavation as long as the line of the village street occupies its present position.

The survey (plan, pl. xxix) gives a clear idea of the general design of the five circles and the position of the other huge sarsen stones associated with

¹ The vallum now remaining nearest to the causeway would appear to have obstructed the entrance-way from the Kennet Avenue, but this is not really so, for allowance must be made for the silting down of the material composing the vallum at its end, forming a talus, and for the fact that other beech-trees have been planted in this position, caused obstruction, and gathered round them a certain amount of decayed vegetable matter.

them; it also shows at a glance that although the four inner circles were really circular, the Great Outer Circle was very much out of the true. It also indicates how much the modern village has intruded upon the ancient monument.

In one place only did we find time to investigate the construction of the vallum (Cutting X) and examine the old turf line on which the material had been thrown up. This afforded evidence of very late Neolithic date, Peterborough ware (Neolithic B) being found on the old surface, and some flint implements elsewhere described.

The fosse cuttings produced a good number of ancient remains, and these have been brought together in an 'average section' (pl. XLIV) where they are shown at their relative depth. The whole group of pottery may be assigned to the overlap period in North Wiltshire¹ between the end of the Neolithic and the dawn of the Bronze Age.

The total absence of metals in the lower parts of the silting of the fosse and in the vallum cutting affords strong negative evidence.

The antler picks and rakes and the bone shovels, mostly found on or close to the floor of the fosse, and all deep in the chalk silting, supply a very clear indication of the kind of tools used by the constructors of this amazing ditch. They alone would at least have suggested the Neolithic-Bronze transition period, but fortunately we have the stronger evidence of pottery and flint implements upon which to base our conclusions.

¹ When the Avebury excavations began in 1908 comparatively little was known as to the details which afforded a clue in dividing Neolithic from early Bronze Age pottery with any degree of certainty.

VII.—*Seal Bags in the Treasury of the Cathedral Church of Canterbury*

By Miss GERTRUDE ROBINSON and Miss H. URQUHART

With notes on the Weaving by Miss ALICE HINDSON

Read 19th April 1934

INTRODUCTION

SOME sixty years ago it was found that many of the seals of the charters of Canterbury Cathedral were covered with or had attached to them pieces of silk. Silk at this period, owing to the researches of such scholars as Francisque Michel, Fischbach, and Lessing, was beginning to attract the attention of scholars, artists, and archaeologists. The silks attached to the seals of Canterbury were seen to be interesting or at least unusual. They were taken from the seals, to which as a matter of fact they were detrimental rather than protective, with a view of preserving both seals and bags. Later on, cleaned and restored as far as possible to their original colours, they were placed in glass cases, where they can now be seen and studied.

The Canterbury collection is, so far as is known, the largest collection of seal bags in England. It is important in many ways. The date of the charter to which the bag belonged gives in each case the *terminus ad quem* of the silk which must have already served its original purpose before its remnants were taken to fulfil their last duty.¹ Of the thirty-nine seal bags of Canterbury some are merely linen linings of bags, some are silk of plain 'tabby' weave, but most of them merit attention and study, and some of them are unique.

In these days when the ancient silk wealth of the world, once more precious than gold, is represented by pitiful scraps, when the once vast and priceless treasures of the Roman churches, whose catalogue makes the pages of the *Liber Pontificalis* a lyrical poem, are reduced to a few poor fragments² in the treasure of the Sancta Sanctorum, when France, having torn down the silken

¹ Professor Wace draws attention to the possibility of some of the bags having been made of 'tailors' scraps'. Some of the silks of a later date, Sicilian or Italian (for example, nos. 23 and 24 and other pieces which were of the same time as the seal bags which they contained), were quite probably sent in rolls to Canterbury for use in the Cathedral and the bags were made of such scraps as were left over in the cutting out. This can hardly fail to have been the case with regard to no. 23 in which the selvedge can be seen, but there are several pieces of silk of an earlier date, some of which may have been woven three or four hundred years before they were made into seal bags.

² See Note, p. 204.

wealth which clothed the walls of her abbeys and churches, now eagerly searches in any corner to find some remains; when of the vestments and hangings of old St. Paul's nothing exists, we may be thankful that at Canterbury some of the old silk treasures had been cut up into seal bags before they perished from neglect or wanton destruction, so that at least we can see how beautiful they must have been.¹

Besides these seal bags there are a few in the Record Office, in the Muniment Room of Westminster Abbey, in the Muniment Room of King's College, Cambridge, and in the Victoria and Albert Museum.² No extensive search has been made for seal bags in Italy, France, or Switzerland, where, however, we find many precious specimens of ancient silks otherwise used, e.g. to wrap the bodies of dead saints or ecclesiastical persons of high rank. Those which

¹ This can be imagined by those who read the old inventories, as did the great historian of silk Francisque Michel, who recorded the result of his researches in a book of inestimable value. Hope and Legg (J. Wickham Legg and W. H. St. John Hope, *Inventories of Christ Church, Canterbury*) have published various inventories of Canterbury Cathedral and a study of them is to be recommended to any one who would know the ancient treasures which existed there. To mention a very few from an inventory of 1321:

Vestimentum de rubeo panno de Antioche cum avibus de Inde et capitibus aureis; see note to no. 25 on vestments of Hubert de Walter.

Item vestimentum de panno rubeo de Antioche cum avibus et bestiis viridibus et capitibus et pedibus aureis.

Capa Henrici de Sandwyco nigra brudata cum leonibus et griphonibus.

Casula Lanfranci . . . cum avibus et bestiis.

Casula rubeo de Antioche operata de avibus et bestiis.

² None of them is equal in interest to the Canterbury bags. Those in the Record Office and in Westminster Abbey are still attached to their seals and are difficult to examine.

One of those in the Record Office (Case A. 10, attached to a charter of Thomas à Becket given to the canons of Holy Trinity, London) appears to be Chinese. It apparently contains the three rounds which are the Chinese signs of earth, air, and water, and is red silk with gold brocade.

Another (attached to a charter of Henry III to the prior and canons of Holy Trinity) seems to be Sicilian. Another is attached to three private letters of the early 14th century, and has one of the thick warps we are accustomed to associate with the class of silk which is often described as 'Regensburg'. It apparently bears the design of a griffin.

The most important seal bags in Westminster Abbey are those attached to the seven seals of the Charter of Stephen Langton. They are all of the same material and the design seems to consist of griffins, perhaps addorsed and regardant.

The Victoria and Albert Museum has seven seal bags of which the most important (T. 63. 1191) is described in no. 11.

C. Eveleigh Woodruff in *Archaeologia Cantiana*, vol. 41, p. 35, gives a description of three seal bags which were attached to their original charters. (1) A bag attached to a charter of A.D. 1242 which has a cotton warp and a weft of coloured silk of yellow, white, crimson, and pale red, with an intermixture of gold thread. (2) A seal bag belonging to Bilsington Priory attached to a seal and charter dated A.D. 1250. A full description of it is given in the article. Dr. Woodruff rightly considers the most interesting feature to be the 'double-headed eagles displayed which rather resemble parrots than eagles'. They probably are parrots. (3) A bag attached to a charter dated A.D. 1349 of yellow silk diaper with a pattern of fine lobed leaves.

we have seen in England so far have been used to protect charters granted by kings or other important personages to religious houses and ecclesiastical foundations. They are like the fragments which wrap the bones of saints in the reliquaries,¹ and correspond to the descriptions of the church treasures in the inventories.

There are few things more difficult than to determine the exact date and provenance of these pieces of silk, and there is at the same time in the whole history of commerce and of art nothing more romantic than this substance born in the Far East (the men of the West knew not how), which had travelled over terrifying mountain passes, through awful deserts, carrying woven in its heart the signs of the instincts and thoughts of strange peoples, to live in the courts of strange kings, to be the theme of their poets and the price of kingdoms, and to witness the rise and fall of peoples and empires.

It was for the Greeks and Romans shrouded in mystery. Some poets like Dionysius Periegetes² and Priscian tell of the people of the Seres³ 'who weave into webs which the spider cannot rival the many-coloured flowers of their desert-places'.

Others believe that silk is a fleecy white substance growing on the trees of China, which is washed and combed off.

Vergil sings of the Seres combing the delicate fleeces off the leaves of their trees.⁴ According to Strabo⁵ it is by reason of the heat of the climate that in China some of the trees 'grow fleeces'.

Seneca the tragedian⁶ calls on his countrywomen to discard the purple of Tyre and the filaments which the far-off Seres gather from their trees; and Silius Italicus⁷ tells how the Seres, 'when the earliest rays of the sun shine on them, go and gather fleeces from the wool-bearing thickets'.

¹ Some of these treasures taken from reliquaries can be seen at Sens, at St. Maurice in Valais, at Sion, and in the Louvre, not to speak of the magnificent and early silks taken from the tomb of St. Giuliano at Rimini, most of which are in the Museum of Ravenna; the silks from the tomb of St. Cuthbert at Durham, and those from the Treasure of the Sancta Sanctorum at Rome. The date of one piece, at least, of the Rimini silks can be approximately fixed. It is a delicate floral design of the same pattern as the dress of one of the Empress Theodora's ladies represented in the mosaic of the apse of St. Vitalis.

² Dionysius Periegetes, *Orbis Descriptio*, l, 752 seq., ed. Müller, *Geographi Graeci minores*, tom. ii, pp. 103-76.

³ Seres are not necessarily Chinese, but any people of the extreme Orient; for example, the Chinese Ser, the Corean Sir, the Mongol Sirkek, and the Manchu Sirghe are all names of silk. The Greek word for silk was μέταξα. For instance, Procopius (*Pers.* i, 20): Αὕτη δέ ἐστιν ἡ μέταξα ἐξ ἧς εἰώθασι τὴν ἐσθῆτα ἐργάζεσθαι, ἣν πάλαι μὲν Ἕλληνες Μηδικὴν ἐκάλουν, ταῦν δὲ σηρικὴν ὀνομάζουσιν: and (*Vandal.* iv, 6) καὶ Μηδικὴν ἐσθῆτα ἣν νῦν Σηρικὴν καλοῦσιν.

⁴ *Georgics*, ii, 121.

⁵ Strabo, *Geo.* xv, c. 693.

⁶ Seneca, *Phaed.* 387, 389.

⁷ *Punic Wars*, vi, 1-4. Solin, Claudian, and Ausonius speak of the same phenomena; quoted by Coëdes, *Textes d'Auteurs Grecs et Latins relatifs à l'extrême Orient*.

Even Jacques de Vitry in the 13th century repeats the same story.

It is, however, Pliny who gives us the most circumstantial account of what was, according to the popular idea, the method of making silk.

Speaking of the lands beyond Scythia he says: 'The first people of whom we know are the Seres, celebrated for the wool-like substance of their trees, from the leaves of which they detach a hoary whiteness (*canitiem*) by washing them down with water, and thereby give our women the twofold work of unravelling and reweaving the threads¹ "redordiri et rursus texere".'

These words are almost universally taken as meaning that it was the custom for the Chinese silks to be unravelled and rewound by the Romans for their own use. This they did because the Chinese exported their silk woven, and it was therefore necessary to unravel it in order to make the fine gauzes which were required for the Roman market.²

Pliny uses the same words in another part of his *Natural History* (xi, c. 76), where he is obviously translating Aristotle.³ Here he says: 'There is a great worm which sends out as it were two horns and from it comes a creature which is called a bombylis, then a necadylus, and then in six months a bombyx. They weave after the manner of spiders' webs, for the clothing and extravagance of women, tissues which are called bombycinae. The first who discovered how to unravel and to weave again these strands was Pamphilia the daughter of Platea in the island of Cos.' Here the same words 'redordiri et rursus texere' are used.

It is perfectly clear from this passage that though both Pliny and Aristotle knew of the existence of a silk-spinning grub they neither of them connected it with the art of sericulture as practised in China. Pliny indeed thought, like Vergil, that Chinese silk came from the trees. Pausanias⁴ is the first classical writer who seems to know anything definite about the Chinese methods. He

¹ Pliny, *Nat. Hist.* vi, 54. Cf. also Lucan, *Pharsal.* x, 141-143.

Candida Sidonio perlucent pectora filo
Quod Nilotis acus conpressum pectine Serum
Solvit et extenso laxavit stamina velo.

² A curious instance of 'unravelling' was pointed out to us by Prof. Wace. In the 19th century red flannel which was sent from England to America was unravelled by the Navajo Indians in order to get red stripes to put into their blankets. There is a piece of blanket containing such stripes in the Victoria and Albert Museum.

³ It is probable that Aristotle heard of the silks of China from some one belonging to Alexander's expedition. Traditions may have been current in Greece about the origin of weaving, or about weaving silk from wild silk-worms which may have been supposed to weave like spiders from leaf to leaf. It is possible that such an idea may have given rise to the 'vellera' which the Chinese comb from the leaves of their trees.

⁴ Pausanias, *Description of Greece*, vi, 26. 9.

says: 'The filaments from which the Chinese make their fabrics do not come from a fibre. They have an entirely different origin. There is in their country a little creature which the Greeks call Ser but to which the Seres give a different name. The size of this creature is double that of the largest beetle. For the rest it is like the spiders which make their webs on the trees. They have four feet like spiders. The Seres rear these creatures and make cages for them which vary with the summer and winter. These creatures make a fine web which is twisted round their feet. For four years the people feed them on millet, but in the fifth, for they know that they will live no longer, they give them a green reed. It is the food they like best and they devour it eagerly till they burst, and in the midst of their bodies is found the best thread.'¹

If we compare this passage with those of Pliny and of Aristotle it is evident that neither Pliny in his second passage, nor Aristotle, is speaking of the silk manufacture of China. The secret of that was certainly not known at this time farther west than Khotan. In that case what was bombycina?

I think that we find the answer to that question in the Chinese chronicles.

In the Chronicles of Wei-liao compiled before the year A.D. 429 there is an account of Syria (Ta-ts'in, also called Li-kan) in which it is said: 'The country produces fine hemp-cloth. . . . They weave fine cloth and say they use the down of water sheep in making it; it is called "cloth from the west of the sea". Some say that they use not only sheep's wool, but also the bark of trees and the silk of wild silkworms in weaving cloth. . . . Further, they were always anxious to get Chinese silk for severing it in order to make "hu-ling" (foreign damask, gauze), for which reason they frequently trade by sea with the countries of An-hsi (Parthia).'

Ma-tuan-lin, also speaking of Syria, says: 'They always made profit by obtaining the thick plain silk stuffs of China which they split, in order to make foreign damask and purple dyed goods, and they entertained a lively trade with the foreign states of Parthia by sea. . . . Their king always wished to send envoys to China but the An-hsi wished to carry on trade with them in Chinese silks and this is the cause of their being shut off from direct communication.'²

These quotations make it clear that not only were Chinese silks unravelled in Syria and re-woven and dyed purple for the Roman market, but that there was also a wild silkworm whose produce, often woven in with fibre and

¹ However fantastic Pausanias's account may be, he must have got his information from some one who had had exceptional opportunities for observation, perhaps a member of the mission which went (possibly from Syria) in the time of M. Aurelius. He knows that the worms live in houses, he knows about the rush given to the worms in which to spin, though he thinks it was for food, and he knows that the silk grub is not allowed to end in the moth.

² See Hirth, *China*, pp. 71 and 80. Silk was also under the later empire exported in the raw state.

wool, must have been of inferior quality. This worm would have been left to feed at its will, and, instead of being killed when the cocoon was ready, the moth would come out of it, breaking and discolouring already inferior silk. It was probably out of this silk that the 'bombycinae vestes' spoken of by Propertius and Juvenal were made.¹

Chinese silk was probably not known in the Near East until the expedition of Alexander. Strabo quotes Nearchus, Alexander's general, as saying that in the Far East, owing doubtless to the warmth of the climate, certain trees grow wool which is used to weave beautiful fine stuffs.² It was not until the end of the second century B.C. that Mesopotamia (T'iao-chib) and Syria (Ta-T'sin or Li-kan) became known to the Chinese through the information brought to China by T'sang-chien, the emperor's yeoman and the first Chinese explorer. Until that time the Chinese seem to have thought of themselves as hemmed in by a solid wall of barbarism. T'sang set out at the emperor's command to find a way by which the Chinese could join forces with the Scytho-Indians against the Huns, who had driven them from their homes to take refuge on the north bank of the Oxus. After ten years' imprisonment by the Huns, who captured him at the beginning of his expedition, he arrived in Ferghana, and thence made his way to Sogdiana the region of the present Samarkand and Bokhara. His mission to the Scytho-Indians proving fruitless, he went on to Bactria, where he stayed long enough to obtain a good deal of information about Parthia, Syria, Chaldea, and India. He found his way back, after being captured by the Huns, by the Tarim basin, about the year 125 B.C. His tidings revealed to China a whole civilization beyond the barbarous nations which surrounded them, and the intelligence of the Emperor Wu-ti was at once turned to finding a way of communication with the nations of this civilization through the barrier of the Huns.

He was a great soldier, and by the year 121 B.C. the Huns were subdued and their prince sent in his submission. They were driven beyond the desert to the north, and the way was free for the route through the Tarim basin on to Bactria and Persia and Syria, of which that intrepid explorer T'sang had

¹ Cf. Von Falke, *Kunstgeschichte der Seidenweberei* (ed. 1921), Introd., p. 2, who considers it quite obvious that bombycina was the wild silk spoilt by the exit of the silk-moth, which had to be spun like flax instead of being wound from the cocoon, and was so far inferior to the Chinese silk that when the Romans had the opportunity of comparing the two they rejected their own silk for it. In this connexion there is an interesting article by Miss G. Richter (*American Journal of Archaeology*, 1929, vol. xxxiii, p. 27 seq.) in which she convincingly argues that this 'bombycina' was also in use in Greece under the name of 'amorginon' in the time of Aristophanes and earlier.

² Strabo, xv, c. 693. The passage runs: ἐκ δὲ τῆς αὐτῆς αἰτίας ἐνίοις καὶ ἐπανθῆιν ἔριον. ἐκ τούτου δὲ Νεάρχος φησι τὰς εὐητρίους ὑφαίνεσθαι σινδόνας, τοὺς δὲ Μακεδόνας ἀντὶ κρηφάλλων αὐτοῖς χρῆσθαι, καὶ τοῖς σάγμασι σάγης· τοιαῦτα δὲ καὶ τὰ Σηρικά, ἐκ τινῶν φλοιῶν ξαινομένης βύσσου.

dreamed through weary years of travel and imprisonment. He led the first of the missions westward and died on his return in 115 B.C. After the passage through the Tarim basin there seem to have been three main routes to the West: the chief was from Margiana to the Caspian Sea, thence to Ctesiphon and Seleucia, and thence through Mesopotamia to Syria and Antioch; another road led from Seleucia to Palmyra, which was the junction for Antioch on the one hand and Damascus on the other. From Damascus the way led to Tyre.¹

The Chinese silk trade was probably at its height long before we have any record of it, and we have up to the present no other examples of the silk which was produced before the 2nd century A.D. than those which Sir Aurel Stein found in the cemeteries of Lou-lan, an oasis in the Lop desert through which the trade route to the West passed from the 2nd century B.C. to the 2nd century A.D. Examination of the silks found in these excavations established the fact that the technique of Chinese silk weaving differed from that of the West. Amongst the pieces were found woollen stuffs of the later Hellenic work known as Coptic which had been either imported from the West or woven by workmen who had a knowledge of western weaving. In the excavations at Astana near Turgan, silks were found belonging to the 7th and 8th century A.D., some of Chinese design and weave, others apparently done by Chinese workmen under western influence, others again evidently woven in the West.

In the excavation of the Buddhist monastery known as the 'Cave of Thousand Buddhas', whose deposit was accumulated between the 7th and 11th centuries, the western infiltration is still more marked.

One piece of silk is identical in design and execution with the suaire of St. Loup at Sens and with a piece in the Victoria and Albert Museum which probably came from Iran about the middle of the 9th century A.D.

The introduction of the silkworm into the West in the middle of the 6th century and the discovery by the Byzantines of sericulture revolutionized the textile art. In spite of the tight hold which Byzantium kept on her silk monopoly, its diffusion throughout the West was only a matter of time.

In the 10th century both Venice and the principal south Italian towns were in close relation with Constantinople. The great merchant family of Maurus of Amalfi had a house in the city and the members of it were generous in their gifts to the churches and monasteries of Italy—as witness the bronze gates of San Salvatore of Atrani which bear the name of Pantaleone, the son of Maurus.² Desiderius decorated the church of the monastery of Monte Cassino with the help of Byzantine craftsmen and artists procured for him by Maurus. There was a large colony of Amalfitans at Constantinople and their

¹ See a paper by Dr. Giles in the *Transactions of the Cambridge Philological Society*, 1929, 'Silk'.

² See no. 11. The bronze doors of the Duomo at Amalfi bear the same inscription.

merchants were favoured to the extent of being allowed to export the famous Byzantine purple. The Amalfitans were also in close touch with the East. They were in Egypt in the middle of the 9th century, and in the 10th they were trading in Cairo and Alexandria and Antioch.

Trani and Brindisi and Taranto imported eastern as well as Byzantine goods. At Taranto there was a factory for the making of purple dye.¹ The Arab conquests which began in the 7th century did more than anything else to further the diffusion of design and the movement of skilled craftsmen. Under their rule the cities of Bagdad, Tabriz, Aleppo, Alexandria, and Cairo learnt to combine with their own work that of Iran. The trade of Antioch and Damascus, which had dwindled since the rise of Byzantium, revived. Their silk weaving was resuscitated probably by the influx of weavers driven from other places. Damascus became a depot for Persian silk. Bagdad, founded about 750 A.D., became, especially under the rule of Haroun-al-Raschid, one of the great centres of the textile art, and through the good relations of the great Caliph and the European rulers its art, modelled on the best traditions of Byzantium and Persia, became famous throughout Europe. There are probably some pieces of Bagdad weaving at Sens—given, according to tradition, by Haroun-al-Raschid to Charlemagne.

None of the seal bags has Christian designs. They correspond in character with the great proportion of the silks found in medieval tombs and reliquaries, and recall the descriptions of Theodore of Cyr, Asterius of Amasa, and Sidonius Apollinaris of the pictured silks with which in their days the wealthy clothed themselves and adorned their houses.²

The forms and symbols which make up their designs are far more ancient than Christianity. They are forms of forgotten arts and symbols of religions

¹ See Heyd (translated by Raynard), *Histoire du Commerce de Levant au Moyen Age*.

² Theodore, *De Providentia*, Oratio iv: τίς ἂν πρὸς ἀξίαν τὴν δοθεῖσαν σοφίαν τῷ ζῳῷ θαυμάσειε; πῶς ἐνὶ χρώματι τῶν ὑποκειμένων, ἐρίων ἢ σηρικῶν νημάτων, παντοδαπῶν ζῳῶν ἐνυφαίνονται τύποι καὶ ἀνθρώπων ἐνδάλματα, τῶν μὲν θηρευόντων, τῶν δὲ προσευχομένων καὶ δένδρων εἰκόνες καὶ ἕτερα ἄλλα μυρία. Migne, *Patrologia Graeca*, 83. 541.

Asterius of Amasa, *De Divite et Lazaro*: ἀλλὰ τινα κενὴν ὑφαντικὴν ἐξευρόντες καὶ περίεργον, ἥτις τῇ πλοκῇ τοῦ στήμονος πρὸς τὴν κρόκην, τῆς γραφικῆς μιμεῖται τὴν δύναμιν, καὶ πάντων ζῳῶν τοῖς πέπλοις τὰς μορφὰς ἐνσημαίνεται, τὴν ἀνθινὴν καὶ μυρίοις εἰδώλοις πεποικιλμένην φιλοτεχνούσιν ἐσθῆτα, ἑαυτοῖς τε καὶ γυναιξὶ, καὶ παισίν. Migne, *Patrologia Graeca*, 40. 166.

Sidonius Apollinaris, who died in A.D. 463, in one of his letters seems to feel himself constrained to break out into song in order to describe the woven pictures of the hunting scenes which he had seen.

Rutilum toreuma bysso,
Rutilasque forte blattas,
Recoquente quas aheno
Meliboea fucat unda;

professed by mighty empires over which the sands of time have for many centuries lain thick. Into such silks were woven classical Greek figures from Alexandria, hunting scenes from Persia, lion designs from Byzantium, and such masterpieces of Mahomedan design as the St. Josse piece in the Louvre.

LIST OF SEAL BAGS WITH DESCRIPTIONS

Nos. 1, 2 (pl. XLIX)¹

These two seal bags are in the same mount, and are part of the same design. They are cut from the same piece of silk.

No. 1 contained the seal of a licence from Edward III empowering the abbot and convent of Christ Church to make an exchange of land under Letters Patent. The licence is dated 1366.

No. 2 contained the seal of Edward III to an exemplification of a legal judgement and verdict dated 1364.

No. 1 consists of two rounds, the right hand in one piece, the left hand in two non-corresponding pieces of the same silk joined down the middle.

No. 2 also consists of two rounds. The left-hand piece is worn and frayed on the right side so that it loses its circular appearance. A piece of the right-hand round is missing, and a piece from an entirely different piece of silk has been sewn on.

The measurements are : no. 1, Left-hand piece, $5\frac{1}{4} \times 5\frac{1}{4}$ in. ; right-hand piece, $5 \times 4\frac{7}{8}$ in. ; no. 2 Left-hand piece, $5\frac{1}{2} \times 5$ in. ; right-hand piece, $4\frac{1}{4} \times 5\frac{1}{2}$ in.

Opulentet ut meraco
Bibulum colore vellus.
Peregrina det supellex
Ctesiphontis ac Niphatis
Juga texta, belluasque
Rapidas vacante panno,
Acuit quibus furorem
Bene ficta plaga cocco
Jaculoque ceu forante
Cruor incruentus exit.
Ubi torvus, et per artem
Resupina flexus ora,
It equo, reditque telo,
Simulacra bestiarum
Fugiens, fugansque Parthus.

(*Ep. Lib. ix, ep. xiii, car. 2.*)

¹ This piece (reconstructed) is reproduced by Von Falke, *op. cit.*, ed. 1906, vol. i, abb. 178; by Dalton, *Byzantine Art and Archaeology*, fig. 370; by Lethaby, article in the *Burlington Magazine*, vol. xxiv.

SEAL BAGS IN THE TREASURY OF

Measurement of design: Height of peacock from beak to front uplifted claw $3\frac{5}{8}$ in.; body of peacock (breast to tail) $3\frac{1}{2}$ in.; height of column (with branches) 8 in.

This design consists of two peacocks confronting on each side of a column, the top of which opens out into palm branches at which the birds are pecking. Between the

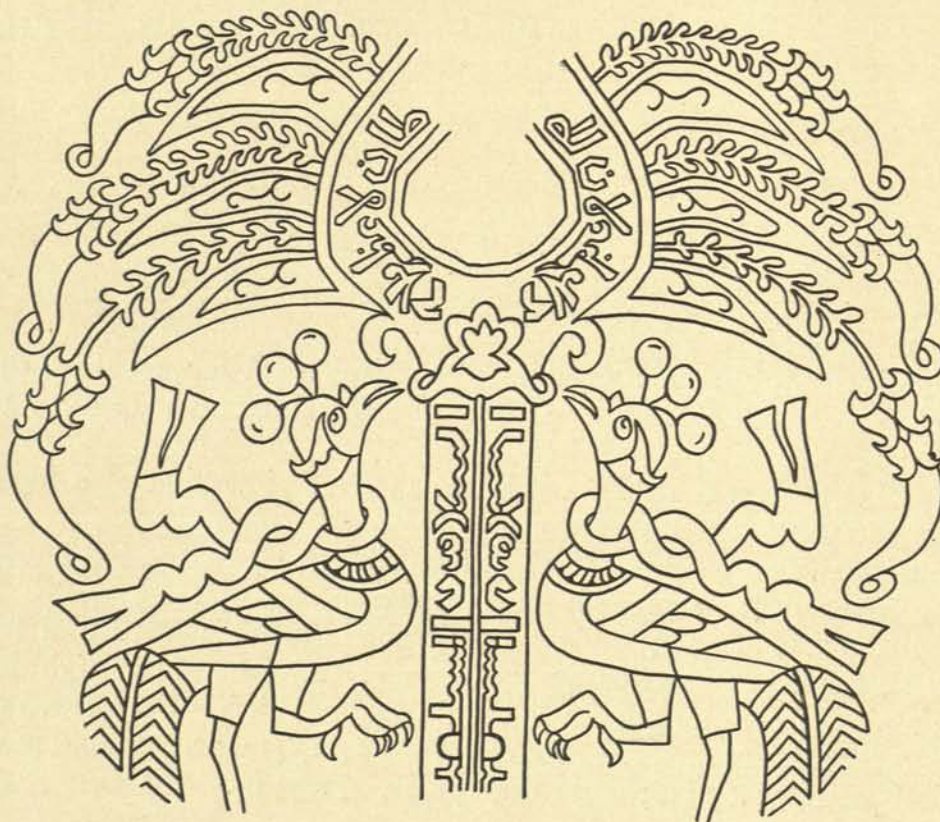


Fig. 1. Seal bags nos. 1 and 2: reconstruction of Peacock design.

branches are long foliated stems of graduated lengths. The whole forms a highly stylized tree.

The peacocks have three head feathers, and there are twisted scarves round their necks. Their tails are drooping, their wings folded, and each has one foot raised and one on the ground.

On each side of the column there is the same cufic inscription, and there is another round the upper and inner side of the tree from which the branches spread.

The scarves round the necks of the birds have bifurcated ends, and recall the scarves of the Persian kings and royal horses.¹ The drooping tails consist of double lines of alternating rows of green and red, outlined in white, of herring-bone pattern. The feet (green outlined in white) are large with long claws. The eyes are white with red circles. Each of the head feathers has a red dot.

¹ Strzygowski (*Asiens Bildende Kunst*) gives (pl. 395) a splendid example of the use of this scarf both on king and horse. The magnificent silver dish of King Bahram V showing floating scarves of horse and rider is in the British Museum. Von Falke (*op. cit.* abb. 70) reproduces it.

The colours used in the execution of this design are red, green, and white. The ground work is red, and the birds and their scarves green outlined with pale yellow. The bodies of the birds were originally brocaded with gold or silver gilt. The wing and collar ornaments are outlined in white. The column and branches are green outlined in white, and the inscription is red outlined with white.

Two of the palm branches on each side have a pattern of silver gilt and white, and one of silver gilt, red and white.¹

The centre ornament of the tree is gold and white. The inscription round the centre ornament is green, outlined with white on the red background.

Lessing² gives an example of peacocks, green on a red background, which have neck streamers and ornamented wings. On one side there is a stylized tree. Lessing considers this to be Byzantine or Persian of the 7th or 8th century.



Fig. 2. Sacred tree between two hills. Ward, *Seal Cylinders*, fig. 663.

Von Falke gives examples of ducks with neck streamers, which he considers to be Persian work of the 6th–8th century from Kyzil in Chinese Turkestan.³

In the Musée historique of Lyons a goat, probably Sassanian of the 6th century, has a twisted and bifurcated scarf of this kind.⁴ Von Falke also gives reproductions of peacocks at Aix of the 6th century with head feathers like those of this silk.

The piece sewn on to the right-hand round is too small for the design to be made out. The background is of purple silk, with a design of gold outlined in yellow silk. The pattern seems to consist of a small bird regardant in a circle. Round the circle are three triangular bands encircling a palmette ornament.

Many textiles worked under Mohammedan influence have cufic inscriptions which in some cases give the date and provenance of the silk.⁵ Some are merely pious ejaculations or salutations. We may instance the silks of Durham, St. Maurice, Sion, and the Currer Museum in Venice, which contain birds with cufic inscriptions on their bodies.

¹ The probable remains of some tarnished silver on the body makes it seem likely that the decoration was silver gilt.

² *Die Gewebe-sammlung des K. Kunstgewerbe-Museums*, vol. i, pl. xxiv.

³ They are on wall-paintings brought by Le Coq from Chinese Turkestan and are now in the Museum für Völkerkunde at Berlin. See Le Coq, *Buried Treasures of Chinese Turkestan*, p. 143 sq., and *Innermost Asia* by Sir Aurel Stein, who constantly refers to the Persian work found there, of which there are also specimens in the British Museum; Von Falke, *op. cit.* abb. 67.

⁴ The famous peacock stuff from the coronation robes of Robert of Naples (Von Falke, ed. 1921, taf. 5), though it has head ornaments and collar, and resembles this in many ways, has no scarf. It is of the latter half of the 12th century.

⁵ See an interesting series of articles by Kendrick and Guest in the *Burlington Magazine*, 1932, which mentions three specimens thus dated. One is in three parts, one in the Royal Museum Brussels, another in the Whitworth Gallery in Manchester, and a third in the Victoria and Albert Museum. The inscription is contained by the last two pieces.

Cufic inscriptions on textiles present a good deal of difficulty. Those on the present piece have been variously interpreted by experts. That on the column is probably 'To Moslems . . . and

The tree design of this silk, which is constantly found, is one of the most common as well as the most interesting of all textile designs. It represents the Sacred Tree or the Tree of Life.

Both Assyrians and Hittites, to whom the symbol spread from Chaldea, use it on their cylinders with figures on each side. A very early one has a winged dragon on one side and a bull on the other.¹ In other examples there are two-winged figures. Possibly the tree symbol came to the Hebrews from the Hittites. Ezekiel speaks of the temple as being 'made with cherubim and palm trees', and, he says, 'a palm tree was between cherub and cherub'.²

But it was in Iran that the Tree was most intimately connected with the rites of religion. Ezekiel describes those engaged in Magian ritual as worshipping towards the East 'holding up the branch to their nose', i.e. worshipping the Sun over the Sacred Tree.³

This piece was sent to the Persian exhibition at the Royal Academy of Arts, and was described in the Catalogue as 'probably Abbasid 8th-9th century, Sassanian influence'.

There is no doubt that it belongs to one of the three great Caliphates, Bagdad, North Africa, or Spain.

Professor Wace is strongly of opinion that it is Spanish in origin. That opinion we have gradually come to accept.

All the details of design which point to a Mesopotamian origin can be found in Spain, whither the survivors of the Omayyad dynasty migrated in the 8th century carrying with them the Persian traditions of art in which they had been educated.

peace'. That on the circle at the top of the column, which is very imperfect, is most likely to be 'The most great Sultan'. This inscription is probably reversed in the repeat and reads as if seen in a mirror. This is Mr. Fulton's reading:

No. 1 (right).

	?	al-salām
	←	
to Moslems ???	and peace	
لمسلمين	السلام و	
→	[reversed]	same legend

No. 1 (left).

?	←	الاعظم
	←	
MAZA-LA NĀ[TLUS]		
	→	
	[Sult]ān [a]l-'azam	
	The most great Sultan.	

Mr. Fulton adds: probably Egyptian, Fātimid period.
Similar decoration found in Armenian work.

¹ Ward, *Seal Cylinders of Western Asia*, pl. 665.

² Ezek. viii, 17.

³ Ezek. xli, 18.

This art superimposed on the art of Byzantium, which the Visigoths introduced into Spain in the 6th century, produced a certain character, not easy to describe but very perceptible.

These Spanish pieces have usually a clear hardness of outline, corresponding to the hardness and brightness of their colours, which are often green and red, and the design has an eastern touch which is found also in the Hispano-Mauresque silks of the 13th or 14th centuries.

These characteristics are very persistent. We have lately seen, in a private collection, a piece of woven silk of the 16th century from Toledo, which has the same colours, and gives very much the same impression as the piece before us.¹

This piece is most probably of the 8th or 9th century.

The small attached piece is certainly much later and of another provenance.

No. 3

The seal this bag contained is attached to a charter dated 1188. The bag is of plain blue silk, twill weave. Measurement $4\frac{7}{8} \times 4\frac{1}{2}$ in.

No. 4

This bag is of plain blue silk like no. 3. The seal it contained is attached to a charter of Richard I, 1189.

No. 5

This is not properly a seal bag. The silk was used to wrap the charter given in 1191 at Messina by Richard I to the prior and monks of Christ Church, Canterbury, giving them authority to revoke sales of land made without consent of the Church. The charter, which is $5\frac{1}{8}$ in. long and $4\frac{3}{8}$ in. wide, including the seal strip, is dated 28th February 1191. To it is attached a fragment of the great seal of England in red-brown wax. Richard sailed from Messina for Cyprus on 12th April. The charter is witnessed by Savaric, archdeacon of Northampton, who accompanied the king.

The bag is in one piece. It is brown, yellow, and blue silk with silver threads. The background is pale yellow, and the design is of birds in brown and blue with silver threads, confronting on each side of foliage. There is a rabbit feeding in the foliage on the right-hand side.

Two bands of blue silk run along at the back of the weave. The silk is Sicilian of the 12th century. It is roughly and loosely woven.

The design can be more clearly seen in the coloured representation in the Victoria

¹ The piece belongs to Lady Wingfield, who acquired it in Spain. It is of considerable size, measuring 114×84 in. It has a design of parrots on curved branches, and it is executed in red, bluish green, and deep yellow. It appears to have two, if not three, warps. Parts of it are very much worn and have been skilfully painted over in the original colours, giving it, from a distance, a curious velvety appearance. It is a superb piece, full of colour and movement.

and Albert Museum than in the original piece, which seems to have deteriorated since the reproduction was done. There is a piece of the same kind of silk which was taken from the tomb of the Emperor Henry VI at Palermo. It is dated by his death, which occurred



Fig. 3. Ram-headed bird from Church of Achthamar.



Fig. 4. Deity with horned bird's head.

in 1197. The design consists of birds confronting amid foliage, off which small animals, apparently gazelles, are feeding.

This piece of Palermo silk is reproduced by Von Falke, *op. cit.* (ed. 1921), abb. 153.

No. 6 (pl. I, fig. 2, and pl. LVI, fig. 2)

The Royal Seal belonging to this bag was attached to a charter of Edward II dated 1317.

The bag is in a glass mount and consists of two circular pieces in one length measuring $10\frac{3}{4}$ in. The two rounds measure 5 in. and $5\frac{3}{8}$ in. respectively, in diameter. As in no. 14 the design consists of two broad bands separated by narrow bands and stripes.

The band on the left side is of a golden yellow colour divided by dots into lozenge-shaped compartments not completely closed vertically. In the compartments are heart-shaped ornaments, alternately large and small. The larger are blue, the smaller purple in colour. They are in rows, and one row contains two small hearts in one compartment. The right-hand band is also of a golden yellow colour, and on it is executed a representation of a griffin carrying off a bird. The bird is of vivid red, the eyes, claws, and markings yellow. It has a long tail, and its head, which is horned,¹ is turned backwards towards its assailant. The griffin is the same size as the bird which it holds in its claws. Its four claws and wings are visible. The whole body was outlined in a colour (probably purple) which has now worn away. Claws, head, wings and tail were in the same colour. Where it was, only pale buff warp threads can be seen. The red colour of the rest of the body and of the eyes remains. The design is repeated twice vertically.

¹ Cf. bird (fig. 3) with ram's head from the Church of Achthamar: Strzygowski, *Asiens Bildende Kunst*, fig. 352.

Also Ward (A. H.) gives an example (fig. 4) of an archaic cylinder in lapis lazuli which represents a seated deity with a horned bird's head (*Seal Cylinders of Western Asia*, fig. 95).



Seal bags nos. 1 and 2. Peacocks confronting on each side of stylized Tree

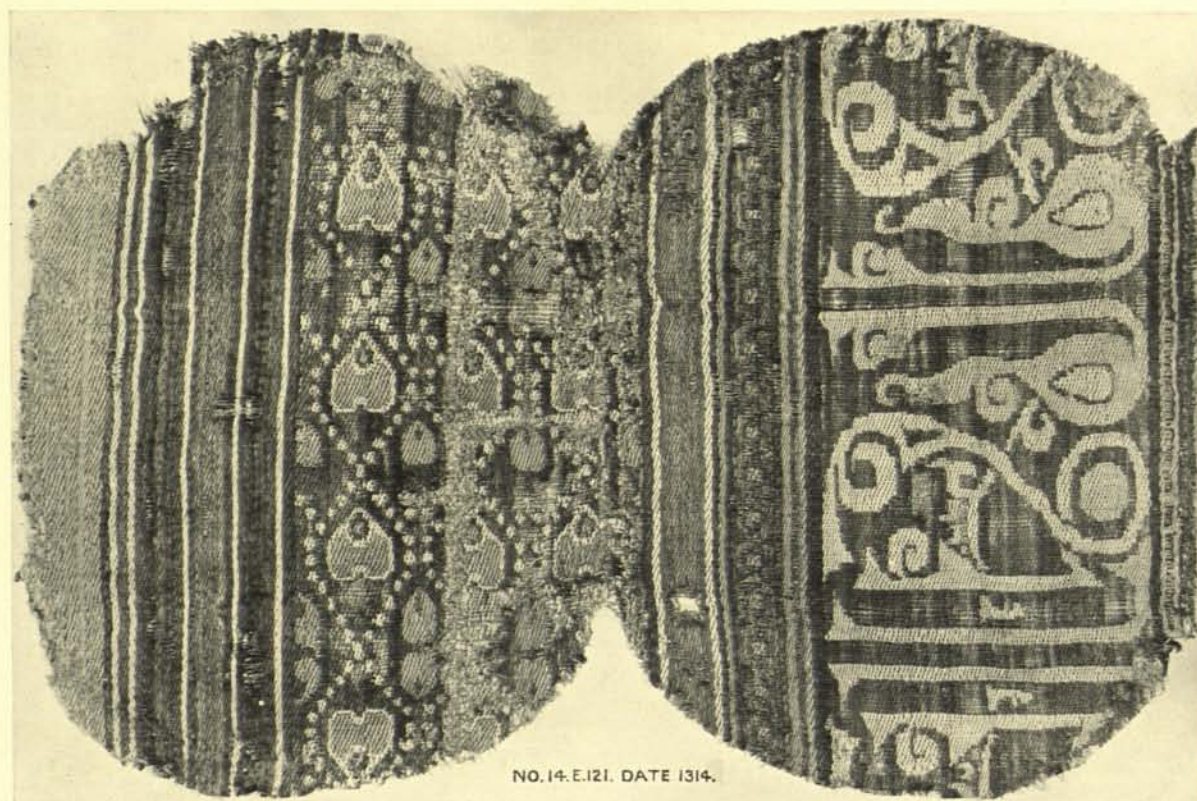


Fig. 1. Seal bag no. 14. Cufic inscription with heart-shaped ornament

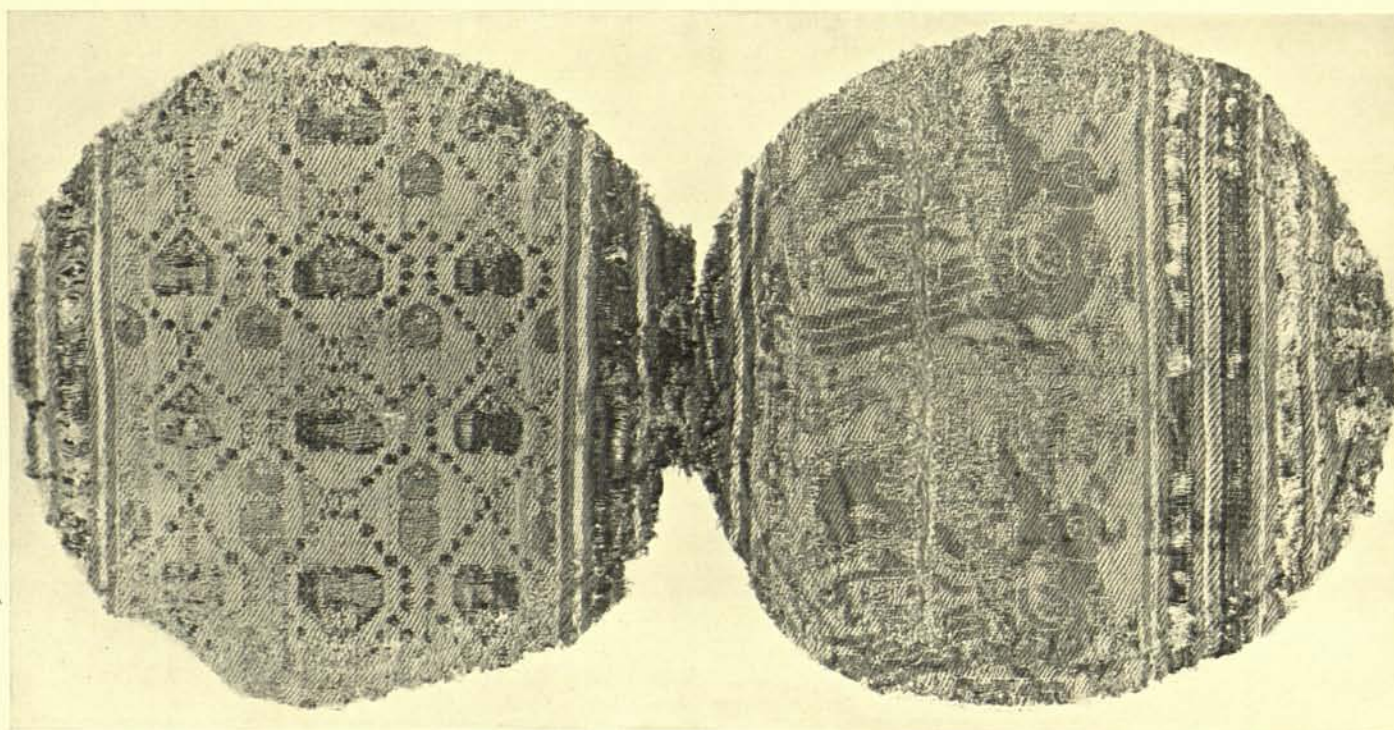


Fig. 2. Seal bag no. 6. Griffin and Bird with heart-shaped ornament

On each side of the broad band containing the design are narrow bands and stripes of red, blue, and white. The red and blue stripes alternate, and down the middle of each red stripe runs a narrow white one. Beyond these, on the right, is a red band containing purple heart-shaped ornaments whose colour is now mostly worn away. A purple scroll design is visible on each side of the bird and griffin design.

Stripes and bands in textile are very ancient, and are oriental in origin. They were used in the designs of those famous weavers of the ancient world, the Phoenicians.

The hangings of the Hebrew Tabernacle in the wilderness were apparently woven in bands of colour.¹

Among the silks found by Sir Aurel Stein in the Lou-lan territory, now part of the Desert of Lob, in Chinese Turkestan, is a piece of silk tapestry divided into broad and narrow bands. The broad bands contain horse-legged birds confronting over a nest, and the narrow ones a design composed of heart-shaped ornaments alternating with a leafy scroll pattern.

Mr. Andrews gives the date of this piece as not later than the 3rd century A.D.²

In the West, lines and bands are particularly characteristic of Coptic work.

In the Charta Cornutiana (the 5th-century inventory of a church at Tivoli)³ lines and stripes are spoken of as forming the decoration of woven silks. It mentions 'a web of silk with gold lines; Byzantine purple richly decorated with lines of gold; hangings of Phoenician purple crossed with lines of scarlet and green'.

The griffin attacking man, beast, or bird is of eastern origin, and western representations of this design are, until a late date, all due to oriental inspiration.

Filow (*Early Bulgarian Art*, p. 5) gives a representation of a 7th- or 8th-century marble capital from Star-Zogara of a griffin attacking an elephant.⁴

In the Musée historique of Lyons there is a piece of tapestry which represents a griffin carrying off a bull while a small bird flies upwards from its beak. M. d'Henizel considers this to be of the 10th century, done under oriental influence.

¹ Exodus xxxvi, 8 seq.

² See Andrews, *Ancient Chinese Figured Silks*, p. 16, fig. 15.

³ See *Liber Pontificalis*, ed. Duchesne, vol. i, pp. clxvi seq.

⁴ Mr. Saltmarsh (Keeper of the Muniments, King's College, Cambridge) brought to our knowledge that in the Muniment Room of King's College, Cambridge, there is a seal of Baldwin de Redvers, earl of Devon, which has a griffin attacking an elephant. The elephant has a long body and slender legs, and the griffin is seizing it by its trunk. Its head is turned upwards to the griffin. The elephant is of the type which is produced by artists to whom the elephant was not familiar, i.e. long and slender. The elephant of Star-Zogara is of this type. Baldwin was made earl of Devon in 1141 by the Empress Maude as a reward for his services during the civil war. The seal is attached to a charter conferring lands on the Priory of St. James, Exeter. Dugdale (*Monasticon*, v, 105) gives a representation of the seal but he has mistaken the elephant for a dog.

Baldwin may have adopted his seal from one of the bestiaries of the time. One, in the University Library at Cambridge, has an elephant and a griffin on opposite pages. The elephant is of the same curious long and rounded shape as the elephant of the seal. (II (J.J.) 11. 4. 26.) This was pointed out by Dr. E. J. Thomas of Cambridge University Library.

There is an excellent reproduction of a griffin and elephant, in which the elephant is thin and elongated, from St. Waedburg's convent, Eichstadt, in Lessing, *op. cit.*, vol. i, taf. 71.

Von Falke gives other examples.¹

The winged dragon or griffin appears in early Chaldean art.² He is found on the cylinders in conflict with a god and is probably a mythological representation of the struggle between order and disorder, which is also contained in the myth of the fight



Fig. 5. Griffin and serpent; from capital in crypt of Canterbury Cathedral.

between Marduk and Tiamat (the Son of Light, and Chaos). Tiamat, representing the waters under the earth, became concrete as a serpent and as such passed into Persia, where in the Achaemenian epoch he appears in the form of a monster with a serpent's tail. It was from Persia that he went to Greece, where he is found under various forms, amongst them that of the Chimera.³

¹ Von Falke, *op. cit.*, ed. 1921, pl. 165. Examples are also to be found in Lessing, vol. i, taf. 37 b, 72. A marble plaque in St. Mark's, Venice, of 10th–11th century, represents a griffin attacking an elephant. A fine fragment in the Victoria and Albert Museum (764–1893) represents the same subject. In the *History of St. Paul's Cathedral in London*, 1818, p. 328, there is the following description of a vestment: 'Item baudekynus rubeus cum magnis rotellis et griffonibus et elephantis infra rotellas.'

² See Ward, *Seal Cylinders of Western Asia*, p. 197 seq.

³ Cf. Barclay Head, *Historia Nummorum*, p. 339 and p. 345. Cf. also Homer, *Il.* vi, 179:

πρῶτον μὲν ῥα Χίμαιραν ἀμαιμακέτην ἐκέλευσε
πεφνέμεν. ἥ δ' ἄρ' ἔην θεῖον γένος, οὐδ' ἀνθρώπων,
πρόσθε λέων, ὅπιθεν δὲ δράκων, μέσση δὲ χίμαιρα,
δεινὸν ἀποπνέουσα πυρὸς μένος αἰθομένοιο.

and xvi, 328:

νῆες ἀκοντισταὶ Ἀμισωδάρων, ὅς ῥα Χίμαιραν
θρέψεν ἀμαιμακέτην, πολέσιν κακὸν ἀνθρώποισιν.

See also Hesiod, *Theogony*, lines 319 seq., where the chimera—the breed of Typhon and Echidnos—has three heads—lion, goat, and serpent:

ἥ δὲ Χίμαιραν ἔτικτε πνέουσαν ἀμαιμάκετον πῦρ,
δεινὴν τε μεγάλην τε ποδώκεά τε κρατερὴν τε.
τῆς δ' ἦν τρεῖς κεφαλαί· μία μὲν χαροποίῳ λέοντος,
ἥ δὲ χιμαίρης, ἥ δ' ὄφις, κρατεροῖο δράκοντος,
πρόσθε λέων, ὅπιθεν δὲ δράκων, μέσση δὲ Χίμαιρα,
δεινὸν ἀποπνέουσα πυρὸς μένος αἰθομένοιο.

The griffin belongs also to early Chinese art, but when he first appears there it is difficult to say, or to explain his significance. He may have been beneficent or he may have been the expression of immaterial power, which would account for the fact that the griffin is represented as smaller than, or the same size as, his victim.

In a silk fragment found by Sir Aurel Stein in a watch-tower of the great wall he is attacking a phoenix larger than himself. The piece resembles one whose date can be fixed in the 1st century B.C.¹

On the capital of a pillar in the crypt of Canterbury Cathedral is a representation of a griffin in conflict with a serpent (fig. 5).

It is most probable that this piece of silk was woven in North Africa, and that the decorative bands which form the groundwork of the design were due to the Coptic influence which persisted there under the Fatimite princes.

Like much of the work done elsewhere, it owes its inspiration to one of the great weaving centres of Asia, perhaps Bagdad or Antioch, but more probably the distant Persian province of Khorassan. The vividness of the colours and the movement and realism of the animal design seem to indicate a strong Persian tradition.

Nos. 7, 8, 9 (pl. LII, fig. 1)

No. 7 is a made-up narrow bag pointed at the top, attached to which are the two parchment tags belonging to the seal. The length is $4\frac{1}{2}$ in., the width (at the widest point) $2\frac{1}{2}$ in.

No. 8 is the same silk as no. 7 in a glass mount. It consists of two similar pieces; the length $3\frac{3}{8}$ in., the width $2\frac{3}{8}$ in. It has a separate lining of linen.

No. 9 consists of two similar pieces in glass mount, length $3\frac{1}{4}$ in., width $2\frac{1}{4}$ in.


The silk has a brown (once, in all probability, red) background on which are golden crescents, each containing eight-pointed stars. Running through the centre of the crescent there is a device which it is difficult to determine with certainty. In nos. 7 and 8 it has the appearance of a flower on a stem. In no. 9, if the silk is examined, it seems to be a cross with some foliation. In the photograph, however, the device is clearer and bears much resemblance to the labarum.²

It is possible to reconstruct the whole pattern, which consisted of half-moons and crescents in horizontal lines alternating diagonally.

The width of the crescent is $2\frac{5}{8}$ in., and the space (horizontally) between each crescent is 1 in.

The crescent was much used in design in the early middle ages. At Sens, in the

¹ Andrews, *Burlington Magazine*, vol. xxxvii, p. 75.

² There are, however, marks which seem to indicate that there are half-circles  beneath the short arms of the cross. It is tempting to try and connect it with the head-dress of Persian kings and nobles. See Sarre, *Die Kunst des alten Persien*, where many seal-stones are given as well as the emblems beside the fire-altars, pp. 142 and 143. To none of them, however, does it bear a sufficiently convincing resemblance for identification. The marks which seem to connect it with them may simply be marks in the fabric.

frame marked 'Perse, VII^e-VIII^e siècles', there is a piece of silk which has a design of moons and half-moons in circles on a blue background. In the Episcopal Museum at Ravenna is to be seen the penula which is said to have belonged to Angeloptes, but which is probably of the 9th century. It has circles with lions inset, but the horizontal lines which cover it consist of small spread eagles and half-moons alternating. In the 10th-century Menologium of Basil II the executioner's dress on folio 112 has a pattern of golden crescents alternating with circles on a blue ground.

In the abbey of St. Maurice in Valais there is a piece of silk which is considered to be Alexandrine, which represents dancing men and asses and has a border of scrolls alternating with half-moons. Von Falke¹ gives an example of a piece of silk found in the tombs at Antinoë, which he considers to be Greek work of the 4th-6th century. The design, which is very finely executed, consists of half-moons with the equilateral cross rising out of the centre, alternating with small volute ornaments. The half-moons and volutes are in lozenge-shaped compartments whose lines are composed of tiny alternating half-moons and crosses. With reference to the equilateral cross Mme Errara² quotes Goblet d'Alviella, who says that 'les petites croix équilatérales étaient un objet de vénération chez presque tous les peuples du vieux et du nouveau monde'. In the Musée historique of Lyons there is a piece of Persian silk with a winged-horse design, which has a border decoration of crescents in circles surrounded by moons. Parts of a silk found in the tomb of St. Denis at Angers are in the museums of Berlin and Brussels. They have a design of crescents contained in superimposed rectangles. The silk is supposed by Lessing to be Byzantine of the 12th century.³ Lessing also gives examples of crescents in gold on a blue ground which he describes as 'Orient, Mittelalter'.

The silk with which we are dealing differs from all those to which reference has been made. In none of them do the crescents contain the eight-pointed star. The eight-pointed star is very frequently found in Coptic design, and according to Raymond Cox it came through the Copts into Arab design.⁴

The Turks adopted the crescent as their symbol when they took Constantinople in the 15th century. Its origin is without doubt oriental, and its use as a symbol was universal in the Near East throughout archaic times.

Among the Assyrians and Babylonians the crescent was the emblem of the sun-god Sin (Zu-en) and the moon-goddess Aa, consort of the sun. Sayce thinks that Jericho means the city of the moon-god. Sinai was called after the moon-god as far back as the end of the 6th century B.C. The peninsula was devoted to his worship.

Egypt had several moon deities, all masculine. In the seal cylinders of western Asia the crescent, with and without the star, is constantly found in conjunction with various goddesses.

¹ *Op. cit.*, ed. 1921, abb. 10.

² Errara, *Cat. d'Étoffes, anciennes et modernes*, p. 17.

³ Lessing, *op. cit.*, 79 and 101.

⁴ Cox, *Les Soieries d'Art*, p. 55. Muratoff (*La Peinture Byzantine*, pl. xxiv) gives a mural decoration containing eight-pointed stars which was found in the church of St. George at Salonica. It is of the 5th century and is derived from an earlier tapestry.

In one, a figure seated in a crescent-shaped boat is mentioned as being possibly a representation of the moon-god sailing through the heavens (fig. 6).

Legrain¹ says that the crescent is identified with Astarte Soteira in an inscription in Cyprus. Carrhae in Mesopotamia, a Macedonian colony, was famed for the cultus of the moon-god, and under the Romans a coin which perhaps bears his emblem is found in the time of Marcus Aurelius.² It belongs also to other cities (e.g. Edessa), many of which have crescents as well as stars, some six stars, some nine, occasionally two which, with the crescent, may represent Sin, Shamash, and Isthah.³ The Persian kings have crescents on their head-dresses from the time of Darius.

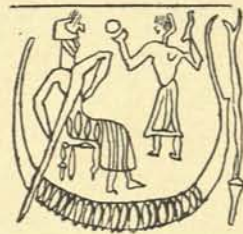


Fig. 6. Deity: probably moon-god in a crescent-shaped boat. Ward, *Seal Cylinders*, fig. 110.

There is a wide field for the provenance of this silk. The crescent would naturally be long reproduced in all the countries where it had been an ancient religious symbol. Its use would be continued in Byzantium, Asia Minor, and Persia under the Moslem. If the cross is an intentional part of the design, it was certainly woven by a Christian—perhaps a Christian slave. The great silk emporia of Asia—notably Antioch—would have contained many such pieces, which were brought back by the Crusaders in their loot. This piece may be connected with a piece of stuff belonging to Canterbury Cathedral which is mentioned in a 14th-century inventory. It is described as ‘*par unum de panno de Tharse coloris de painaz cum stellis et crescentiis aureis*’.⁴

It should probably be dated about the end of the 10th or the beginning of the 11th century.

No. 10

Small plain linen bag. The date of the deed to which it was attached is 1234.

Nos. 10 a, 10 b, 10 c

These three bags are of plain buff silk, tabby⁵ weave.

No. 10 d

Good yellow silk with a narrow herring-bone stripe, in colours, brown, white, and red.

¹ *Seals and seal-impressions in the museum of Philadelphia*.

² Hill, *Catalogue of Greek Coins of Arabia, Mesopotamia and Persia*; introduction, p. xciii.

³ In a relief at Hatra an eagle stands on either side of Helios holding a crescent in his beak. W. Andrae, *Hatra*, vol. i, Helios relief.

⁴ Dart, *History and Antiquities of the Cathedral Church of Canterbury*, Appendix VI, p. vi. For ‘*pannus Tarsicus*’ or ‘*pannus de Tharsae*’ see F. Michel, *op. cit.*, vol. ii, p. 167 *seq.*

⁵ The name ‘tabby’ used for a plain weave doubtless comes from the quarter of Bagdad known as Attab, where, says an Arab writer quoted by Yule, ‘were made the stuffs called Attabiya which are silks and cottons of divers colours’. They seem to have been woven generally in stripes.

No. 11 (pl. LV, fig. 2)

The charter to which the seal contained in this seal bag was attached is dated 1264. It is a charter of Henry II giving to Christ Church, Canterbury, the right of free warren. The mount consists of three pieces, two of the same peacock design, and the third of a horse (or wild ass) in foliage. The height of the peacock design is $3\frac{1}{4}$ in., and the width from side to side of the outstretched wings $2\frac{7}{8}$ in. The horse is 2 in. in length from neck to tail, and $2\frac{1}{4}$ in. in height.

These pieces are reproduced by Von Falke. He wrongly describes them as being in the British Museum, and he places them amongst west Islam work of the 11th century.¹ The designs are executed on bands of colour. The design of the two peacock pieces consists of peacocks repeated vertically on a background of dark green. On each side of the broad green bands which contain the peacocks are narrow red bands with a thin white line down the centre. Beyond these are other bands, on one side, one of green with purple heart-shaped ornaments outlined in yellow; on the other, one of purple with yellow ornaments outlined in white.

The peacocks stand each on a plinth, with wings standing out from their bodies and spread tails. The tails are indicated by twenty-five rods ending in eyes, and are continued in a foliated decoration which fills up the space between the birds. They are woven in yellow silk with dark blue and dark green markings. The birds have the three feathers on their heads, which are surrounded by aureoles. Their necks, breasts, and legs are emphasized by dark and pale green marks.

There are many examples of the peacock with spread tail both in sculpture and textile art. There are some in miniatures.

In the Greek Evangelion of the Vatican (Gk. 354) dated A.D. 948 there is an important one, which is referred to in *Amida*. Kendrick also refers to it in an article in the *Burlington Magazine*.²

The double-headed peacock of Durham, with its spread tail, is probably of the same date and provenance as this one (fig. 7).

Alike also in design must have been the peacock on the hanging of the Monastery of the Saviour referred to in the Diataxis of Michael Attaliates,³ who founded the monastery in the reign of Michael Ducas (1071-8). In the inventory he speaks of 'A covering for the Holy Gifts of deep royal purple containing a peacock in a shell with a border of pistachio nuts'. In the same inventory is mentioned 'an altar covering of green silk for the Holy Table with eleven circles containing a lion-griffin with two heads'.

Of the examples in sculpture, one of the most beautiful is the fine marble plaque at Atrani, which is certainly Byzantine.⁴ Here the peacocks are standing, the one on a

¹ Von Falke, *op. cit.*, ed. 1921, pl. 134.

² Strzygowski and Von Berchem, *Amida*, fig. 311; also *Burlington Magazine*, vol. liii, p. 87.

³ Miklosich and Müller, *Acta et Diplomata Graeca, Medii Aevi*, vol. v, p. 326: ἕτερον βλαττίον καταπέτασμα διβλάττιον ὁξύν· ὁ τῶν κορχεντὸς μετὰ περιφερίων ἐσοφορίων πιστακέων... Ἐνδυτὴ μία βλαττίον κραιμβίζον τῆς ἁγίας τραπέζης ἔχουσα πόλους ἰὰ γρυφολέοντα δικέφαλον. A better rendering is perhaps 'an inside border of pistachio nuts'; i.e. the eyes of the spread tail gave the impression of an inner border. Ἐσοφόριον is a rare word meaning 'inner garment'. I have taken περιφερίων ἐσοφορίων as accusative; 'ο' and 'ω' being interchangeable in Greek of this kind.

⁴ See Introduction, for the connexion between Amalfi and Byzantium.

human head, on either side of which are lamie,¹ the other on a hare at which crows are pecking.

On the walls of St. Mark's at Venice, in the Lion Piazza, there is also a plaque containing a peacock with folded wings and spread tail.

Among the treasures carried to Germany by the Le Coq expedition to Chinese

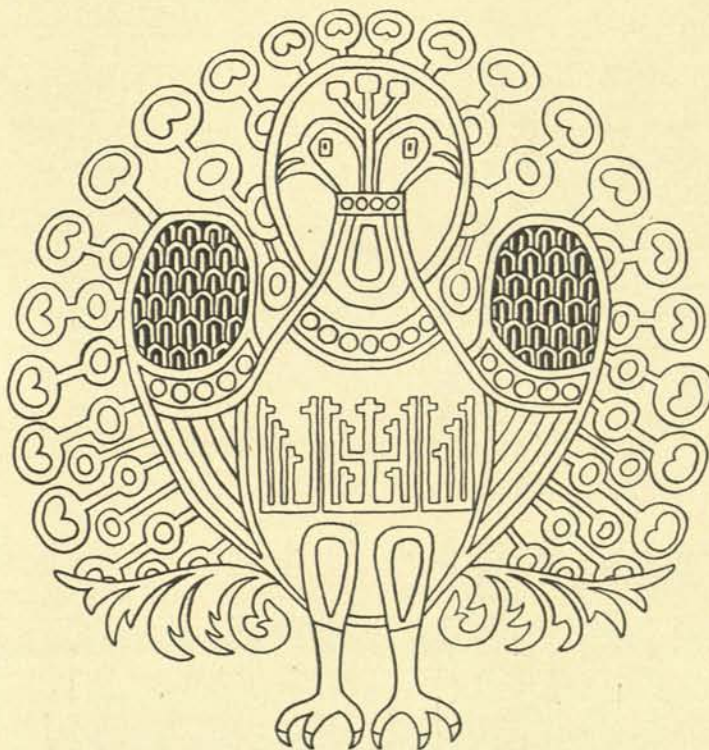


Fig. 7. Double-headed peacock from St. Cuthbert silk in Durham Cathedral.

Turkestan was a piece of fresco representing a peacock with spread tail found at Turfan.

The left-hand piece is of a square shape. It represents an animal, which may be either an ass or a horse, in the midst of a foliated design. He is eating one of the branches which form the design. His eyes are dark green with a yellow centre. The branches of the tree are cream and white. There are remains of silver in the weave.

There are numerous examples, early and late, both in textiles and sculpture of animals in foliage. It is a mode of decoration which is also very common in miniature.² It begins early, being found, for instance, in the Gospels of Rabula. Its origin may be,

¹ A lamia seems to be a malign nature spirit, half human, half animal. Here they have bodies of birds with heads of women. On a mosaic found at Pesaro there are two lamie confronting with the legend LAMI . . E . . They are birds with the heads of women.

² See Dalton, *East Christian Art*, pp. 361, 379. Cf. also the accompanying example (fig. 8) from the cross-shaft of the Easby Cross. It is dated late 7th or early 8th century. The stone which contains it is in the Victoria and Albert Museum. The example is taken from a paper communicated to the Society of Antiquaries by Miss Margaret Longhurst, F.S.A., which appears in vol. lxxxi of *Archaeologia*.

probably is, Syrian, but it is found also in Hellenistic and Byzantine art; for example, on the capitals of columns. The earlier the example the finer and more restrained it is. With this piece may be compared no. 938 of the catalogue of the Persian Exhibition, which is, however, inferior in design, and the original also in colour, probably because it is of a later date. The date assigned to it in the catalogue is the 12th century.

In the later middle ages this design became exceedingly common all over Italy and France in textile art, and is often most confused in design and coarse in execution. But the examples of it which are constantly found in later Persian art are of great beauty.

In this piece we have an example of the Sassanid-Byzantine art adopted by Moslem craftsmen. It was probably woven in one of the towns of Asia, possibly Bagdad, where the Byzantine tradition lingered long after they had become centres of Mohammedan culture. The peacock is characteristic of Byzantine art both in design and spirit. It is severe, restrained, and statuesque. The wild horse, gracefully sporting amid the clustering branches, has all the realism of Persian animal design. The small, compact, upright figures, each in its own compartment, the curling branch-like ends to the tail feathers of the peacock, and the richness of the colours of the silk, interwoven, in the case of the horse, with threads of silver, indicate Arab workmanship of, probably, the 10th century.

Francisque Michel¹ describes a cushion placed under the head of a saint in the church of St. Pierre at Troyes, whose design

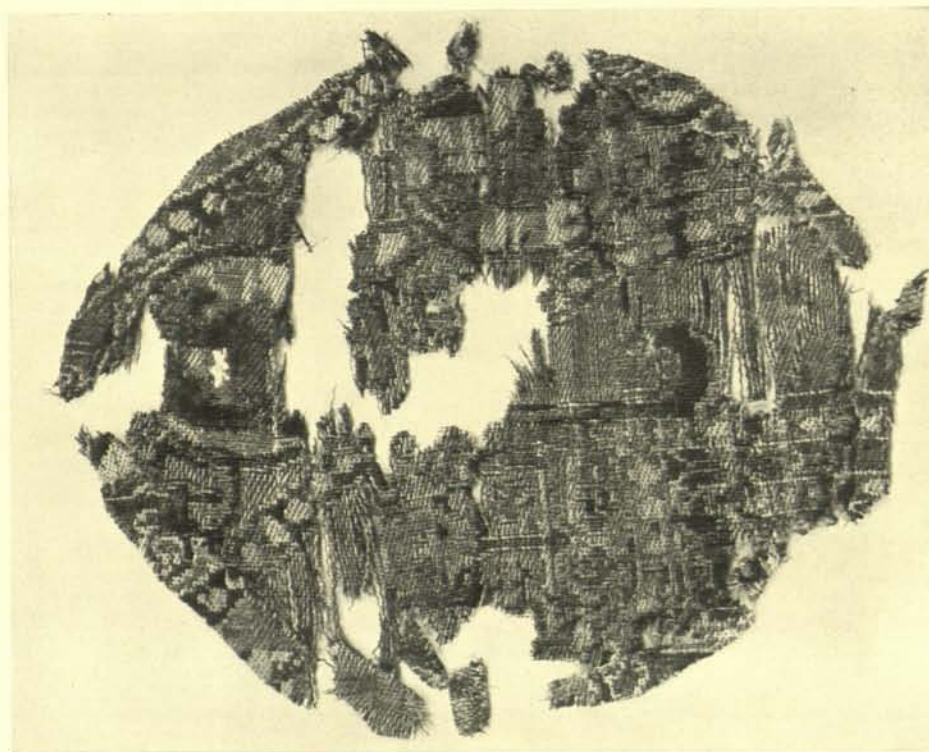
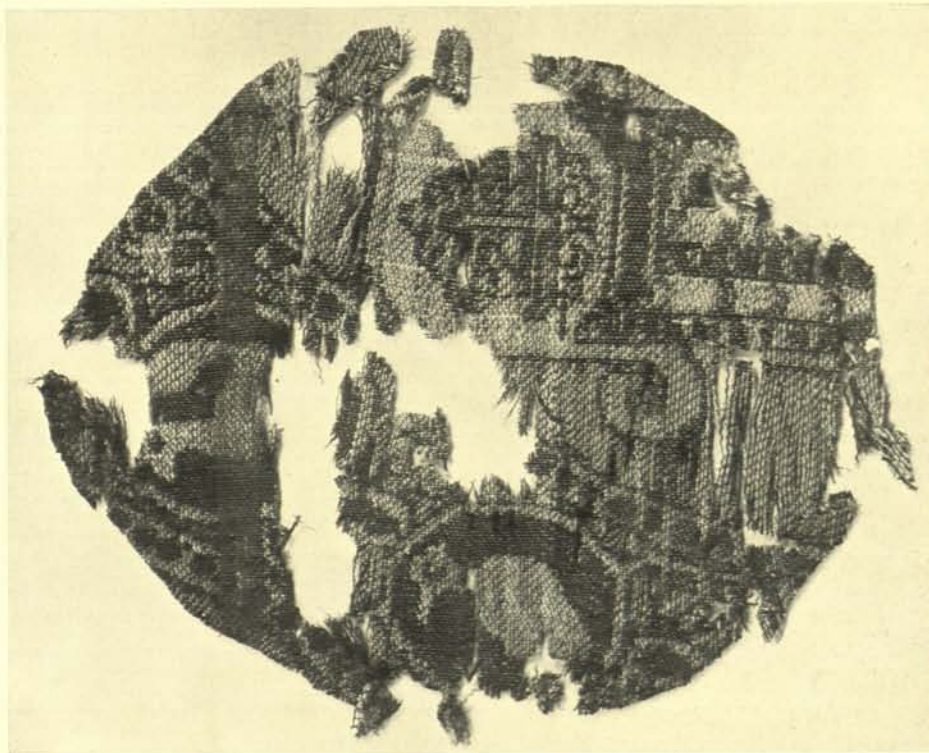


Fig. 8. Horse in foliage from the Easby Cross.

bears a most striking resemblance to this one. The background had leafy branches, whose stems ended with a blue flower. On one side was a band of green with an ornament resembling Arabic lettering; in another band was a large peacock, with outspread tail, from the ends of which sprang small branches that filled up the background. This seems to have been a long band woven in compartments.

One of the few seal bags in the Victoria and Albert Museum is a stripe, 14 in. long, divided into sections separated from one another by bands of blue and green, with heart-shaped ornaments and cufic writing. The compartments contain (1) a fox, (2) an eagle, (3) a recumbent animal, (4) a lion with a human head.

¹ *Recherches sur l'histoire et le commerce des tissus de soie*, 1852, vol. i, p. 53.



Seal bag in the British Museum; see p. 188

Published by the Society of Antiquaries of London, 1935

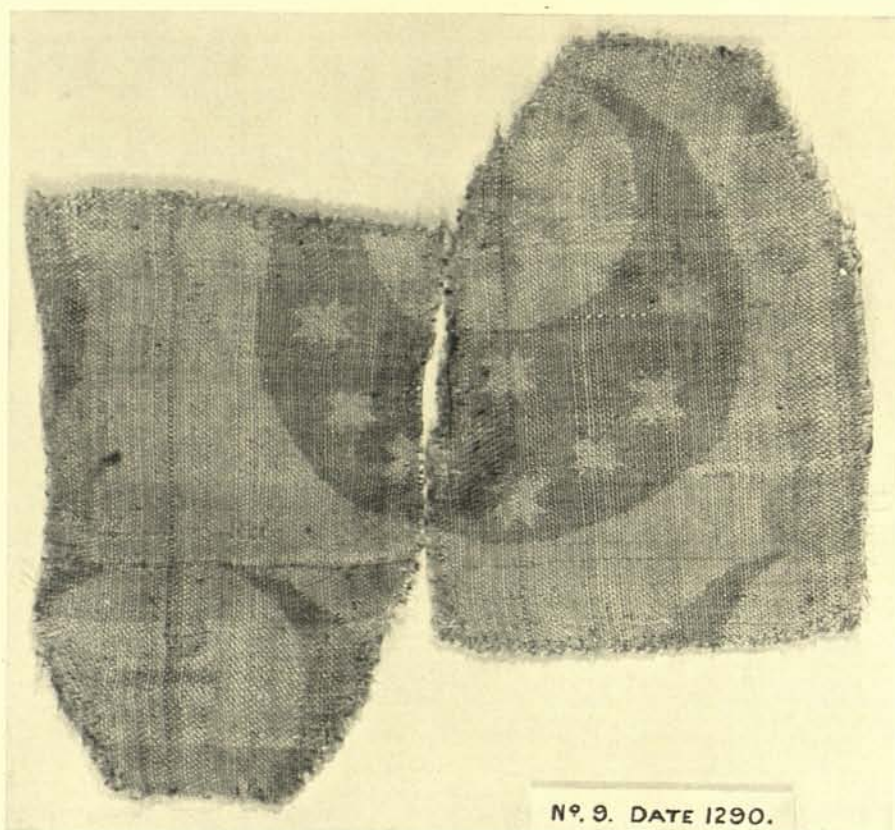


Fig. 1. Seal bag no. 9. Design of Crescent and stars

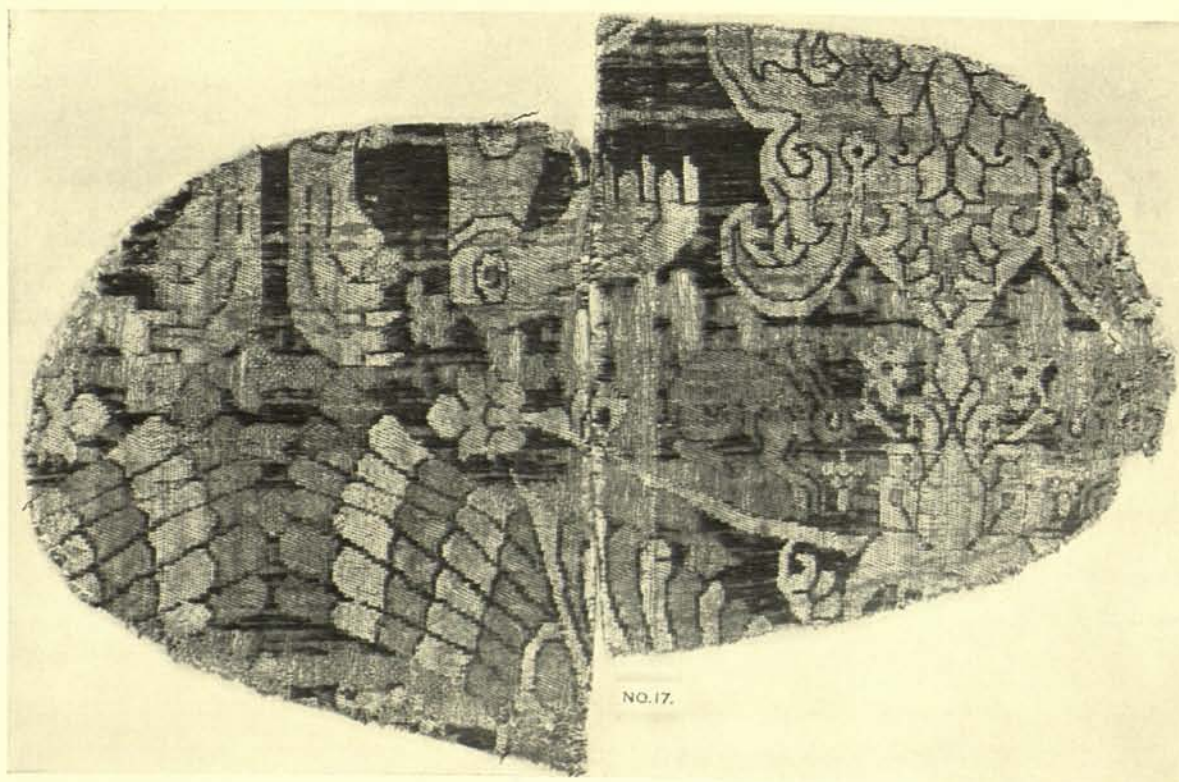


Fig. 2. Seal bag no. 17. Bird and animal design

No. 12

This is a small bag which is in its original state. There is no corresponding seal or charter. The piece consists of a design of heart-shaped ornaments on a red-brown ground. The ornaments are outlined in yellow with a narrow interior line of red-brown, like the background, and each ornament is joined vertically to the next by a straight yellow bar. Each ornament has an interior, smaller, heart-shaped ornament, also outlined in yellow and red, with a spot of red in the centre, and the field of the ornament is made up of bars of colour; the colours are turquoise blue, light green, white, and red; the disposition of the colours varies.

The bag measures $3\frac{3}{4} \times 2\frac{3}{4}$ in. The size of the heart-shaped ornament is $2\frac{5}{8} \times 1\frac{1}{2}$ in. It is lined with linen.

There is also attached to the bag a fragment of an 8-stranded red silk braid which must have attached the seal to the charter.

The colours are very fresh and good.

The boldness of the design and the vivid contrasting bars of colour on the dark red background give the impression of Eastern style and Spanish workmanship. The silk may be Hispano-mauresque of the 12th or 13th century.

No. 13

This bag contained a seal of a charter granted by Queen Eleanor to Christ Church priory, Canterbury, in 1290. It consists of two rounds in a glass mount. The left-hand piece measures $3\frac{7}{8} \times 3\frac{1}{4}$ in. The right-hand piece, which is irregular, consists of bands of golden yellow, with lozenges made by dots, containing blue and purple hearts, like those in no. 6. Both the pieces have horizontal stripes of the same colours as those on no. 6. It is evident that this silk is of the same date and provenance as both nos. 6 and 14.

The warp is pale buff, and there are traces of silver in the weft.

No. 14 (pl. L, fig. 1)

The seal contained by this bag was attached to a charter dated 1314. The mount consists of two rounds, of which the left-hand piece measures $6\frac{3}{8} \times 5$ in., and the right-hand $6\frac{1}{2} \times 4\frac{3}{4}$ in. The two rounds form one design.

The design consists of two broad bands which are divided from one another by narrow bands and stripes of orange, yellow, white, and red.¹ One band is purple, and on it are executed heart-shaped ornaments, large and small, in lozenge compartments in alternate rows. One row consists of two small hearts in each compartment. The lozenges are formed of cream-coloured dots; the large hearts are golden-yellow outlined in white, and the smaller are golden-yellow without outlines. The other band is green,

¹ See remarks on bands and stripes in no. 6.

and contains a cufic inscription in letters of creamy-white and yellow alternating. The letters are much decorated, and the inscription reads :

لا اله الا الله

ḥ malahu la ilaha [illa Allahu]¹

There is no god [but Allah].

On the left of the inscription is a purple stripe carrying an interlocked blue ribbon pattern, a yellow dot appearing in each bend of the ribbon. This is followed by purple-blue, orange, and white stripes, which are probably repeated on the other side of the inscription.

Cufic writing is found, after the Arab conquest, on silks woven in Mesopotamia, Egypt, Persia, Sicily, and Spain. Its presence did not prevent those silks being used in the decoration of Christian churches and of priestly vestments.²

Strzygowski³ traces cufic writing to Central Asia, and Dalton⁴ finds it in Greece in the 10th century. Flowered cufic is found in architectural church decoration in the Greek peninsula and in Ochrida.

The so-called heart-shaped ornament is one of the most common decorations of early textiles. It is used, running in rows, to form the borders of early Sassanian silks as well as in Coptic stuffs. It is not confined to textiles. On the sculptures of Tak-i-Bostan⁵ there are heart-shaped ornaments arranged in fours to form rosettes. On one of the few early dated pieces of Egypto-Arabic silk, of which there are parts in the Victoria and Albert Museum, the Whitworth Museum in Manchester, and the Royal Museum at Brussels,⁶ the border is formed of a row of heart-shaped ornaments. Heart-shaped ornaments surround the elephants in the famous St. Josse silk in the Louvre. The heart-shaped decoration is found representing feathers on birds' wings and on the tail of the chimera.

It is evident that this ornament goes back to very remote times, and it is doubtful what it was originally intended to represent. It has been suggested that its original was the ivy-leaf, and this assumption is perhaps borne out by its close resemblance to ivy-

¹ This is Mr. Fulton's reading.

² In the Cluny Museum (2nd floor, case 2) there is a design of a diagonal containing a cross surrounded by four flattened circles containing rabbits. It has a cufic inscription.

In the case containing the robes of the Abbé Bernard de la Carre, who died in 1216, there is a magnificent vestment in which the cufic inscription is interspersed with ornaments of grapes and tendrils. On the upper part there is apparently only arabesque ornament, but on the lower piece the cufic inscription is quite plain. The piece is remarkable for its richness, having the background woven throughout of fine gold twisted on silk.

³ *Amida*, p. 370.

⁴ Dalton, *East Christian Art*, pp. 199, 370 seq.

⁵ The rock reliefs of Tāk-i-Būstān in the Khurdistan mountains represent Chosroes II (590-628), one of the last Sassanian Kings. Herzfeld (*Am Tor von Asien*, p. 124) has made an exhaustive study of the textile patterns reproduced on the dresses of the figures of these rock-reliefs. See also Sarre and Herzfeld, *Iranische Felsreliefs*, Berlin, 1910.

⁶ Errara, *op. cit.*, IHH.

leaves used as decoration on early Greek vases, from which the heart-shaped ornament only seems to differ by the absence of a stalk. Von Falke connects the heart-shaped ornament with the lotus-flower in bud,¹ and this view seems to be supported by such patterns as the borders of the Annunciation and Nativity in the Treasure of the Sancta Sanctorum in the Vatican Gallery, where the heart-shaped bud is seen rising from the calix.

Signor Sangiorgi,² the well-known Roman collector, has, however, another theory about this ornament. He believes it originated in that feather decoration which was the earliest form of decoration when man's dress ceased to consist entirely of the skins of beasts. Later on, feather work formed the earliest mode of embroidery, and still continued to serve that purpose in classical times, when it was known as 'opus plumarium'. Peacock's feathers were the most used for this work, especially in the countries round the Persian Gulf, where the peacock was indigenous. Not only were the long tail-feathers sewn on in lengths, but they were superimposed on one another, so that a succession of eyes showed one above the other, giving the effect which was afterwards reproduced in the so-called heart ornamentation. This 'opus plumarium' was well known in the middle ages; it is mentioned in the *Liber Pontificalis* and in most medieval church inventories.³ It is also called 'opus plumacium'. The Charta Cornutiana has 'vela auroclava, orthopluma'.

This piece is obviously of the same date and provenance as no. 6. The colours are identical; it has the decorative bands and stripes, and it has, in addition, a ribbon decoration, which is one of the characteristics of Coptic design. Raymond Cox⁴ gives the reproduction of a piece of Arab work which contains the same interlocking ribbon pattern, whose date he fixes as not later than the 10th century.

No. 15 (pl. LV, fig. 1; and pl. LI)

There is neither seal nor charter at Canterbury belonging to this bag, which is in a glass mount containing two rounds joined together, the two making up a great part of the design. The left-hand round measures $4\frac{1}{2} \times 4\frac{1}{4}$ in. The right-hand piece is of the

¹ V. Falke, *op. cit.*, ed. 1913, vol. i, pp. 49, 50, abb. 69.

² *Contributo allo studio dell' arte tessile*, ed. Bestetti e Tuminelli, Milano.

³ The Victoria and Albert Museum has some interesting examples of woven feather work. T. 251, 1921, consists of cloth of linen with fragments of feather interwoven. It has thick brown warps in bundles and the weft is of strips of terra-cotta, blue and buff woven in different patterns. It is Egyptian of the 18th dynasty. T. 153, 1912, consists of ancient Peruvian Macaw feathers on a cotton foundation. The feathers are fastened down by strong weft threads—not sewn on. The work was certainly done before A.D. 1533. There are examples of feather work in Vienna and in the Palazzo Pitti in Florence. The mitre and bands from the Pitti, containing scenes from the Life of our Lord wrought in variously coloured feathers, are reproduced in the *Enciclopedia Italiana* under 'Mosaico' (sub-heading 'Mosaico in Piume'). The feathers are not woven in but attached to strong paper.

⁴ *Soieries d'Art*, Pl. XXIV, 1.

same size, except that a fragment has been torn off the bottom. The width of the eagle from wing to wing is $4\frac{1}{2}$ in. ; the height would be approximately 7 in.¹

The design of this silk is a large oval containing a double-headed eagle and surrounded

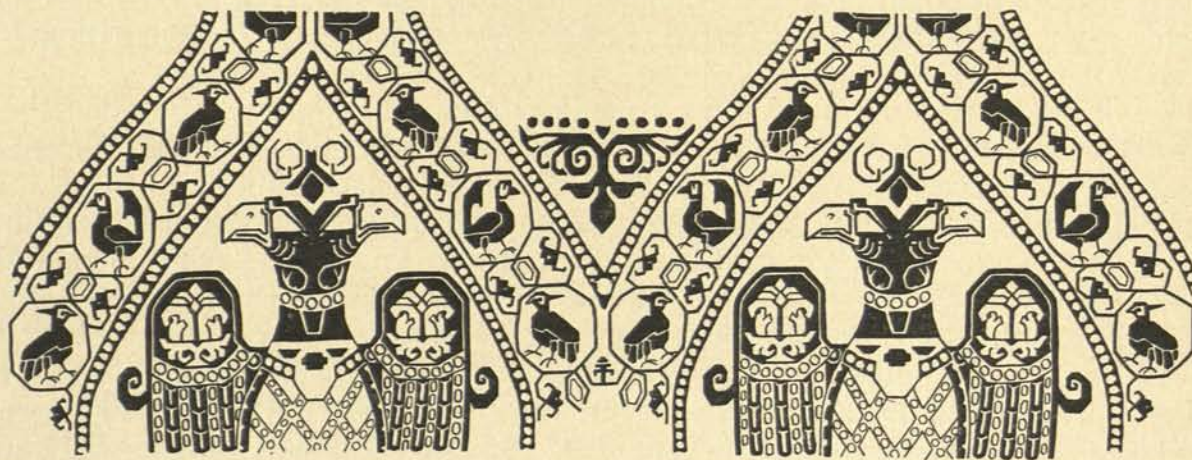


Fig. 9. Reconstruction of double-headed eagle design (in this reconstruction the two birds on each side of the cock have been represented as identical).

by a border of small birds in medallions, looking alternately right and left. The eagle is splendidly designed and executed, and the ornament on breast and wings has all the appearance of mosaic work. The birds are cocks, partridge-like birds (perhaps the chikor), and a third species of which only the drooping tail can be seen, perhaps ducks. The ovals touch, but do not intertwine, and between them is a palmette ornament. The same ornament fills in the space above the eagles' heads in the oval. They are outlined in beaded lines. The background is a rich red-purple much worn away. The body and wings of the eagle are of dark green and purplish red. The beak is white, outlined in blue-green. The eye is yellow, outlined in blue-green and white. This is the only touch of yellow in the piece, and is carried along at the back to be used in the repeat. The outstretched wings have at the top a palmette ornament, and the feathers, which are folded, are marked by alternating lines of blue-green and red purple outlined in white with pearls. The two heads rise from one neck which is surrounded by a necklet inset with pearls. Above this is another ornament encircling the neck from each side, but not meeting.²

The small birds in the white medallions between the ovals are blue-green outlined in white with purple markings. Their eyes are white, outlined in red-purple, and the

¹ In January 1932 we found a piece of the same silk, but evidently part of another bag, at the British Museum, attached to the seal of a charter of Henry I, granting to the monks of Canterbury the rights they possessed in the time of King Edward his kinsman and King William his father. It is published in *Facsimiles of royal and other Charters in the British Museum*, ed Warner and Ellis, 1903, vol. i, pl v. The charter to which this seal bag belonged was probably a duplicate. The bag is reproduced on pl. LI.

² Cf. the neck ornament of the double-headed eagle of Sens reproduced in the *Revue de l'Art Chrétien*, vol. lxi, p. 379, by the Abbé Chartaire.

markings on the wings are white. The cocks have high upstanding tails. The (?) chikors have red-purple crests and green beaks.

Examples of the double-headed eagle are common in sculpture and mosaic as well



Fig. 10.



Fig. 11.

Figs. 10 and 11. Examples of double-headed eagles from the seal cylinders. Ward, *Seal Cylinders*, 421, 825.

as in textile art. Very often he holds an animal in each claw—following the old Chaldean tradition (figs. 10 and 11).¹

There is a red sandstone relief of the 7th or 8th century of a double-headed eagle from Stara-Zagora, in the National Museum at Sofia. Grottaferrata possesses a book-cover, embroidered with a double-headed eagle, and bearing the arms of the Palaeologoi. In the Musée historique at Lyons the eagle is represented with cufic inscriptions on his wings, and holding in each claw a lion, who holds a gazelle.² In the museum of the cathedral at Sens there is a double-headed eagle, whose wing is decorated by an inset griffin. At Sion, in Valais, there is a silk (probably of the Seljuk period) whereon double-headed eagles are woven in rows, with their wings nearly touching.³ Lessing, Von Falke, and Cox give numerous examples.⁴ That given by Lessing from the reliquary of Medlinberg resembles the piece of Canterbury in wings, collar, and shape of head. He describes it as 11th-century work. He also gives a representation of the Vich eagle (from the robes of St. Bernard Calvo of Vich, 1232-43), which bears much resemblance to it.

¹ Von Falke, *op. cit.*, ed. 1921, the Siegburg eagle, abb. 155; the Lyons eagle, 141; the Quedlinburg eagle, 142.

² The eagle which is found on the Babylonian cylinders (called by Heuzey the eagle of Lagash) also holds an animal, sometimes two, in his claws. The eagle with two heads is found in the ruins of the Palace of Eyuck in Cappadocia, built perhaps about 1500 B.C. How the idea of the double-headed eagle arose is uncertain; Dr. A. B. Cook suggests that it was an effort to achieve symmetry. Possibly it may have indicated a beneficent power, able to protect on both sides.

³ A representation of this (and other pieces at Sion and St. Maurice) was published by Stuckleberg in the *Indicateur d'Antiquités Suisses*, published at Zurich, 1924. The eagles have ruffled neck feathers and interesting shield-shaped breast ornaments, and at their feet stand small parrots with long tails. The border consists of a highly ornamented cufic inscription in compartments with small animals in between each.

⁴ Lessing, *op. cit.*, vol. i, taf. 36, 58, 41, 44, 46, 76; Von Falke, *op. cit.*, ed. 1921, abb. 180, 181, 183, 184, 185; Cox, *Soieries d'Art*, pl. XLII. Von Falke gives a representation of the Siegburg eagle (abb. 122) of the 13th century from Bagdad which does not hold an animal in its claws.

Strzygowski (*Asiens Bildende Kunst*, 1930) also gives an example from the Museum of Konia of a double-headed eagle which is not holding an animal (p. 303, abb. 297).

The curious inset ornament on the wings, which looks like two bird-shaped leaves, or birds rising out of a flattened tree, is found also in two other pieces of silk of oriental provenance dated before the 10th century. One piece is in the Victoria and Albert Museum,¹ and Kendrick, in his description of it, calls it 'a highly conventionalized tree-form'. He considers that the silk is of the 7th or 8th century, and comes from Hither Asia.²

There are three points to be noted in determining the provenance and date of this silk. The eagle itself is typically Byzantine, in colour, design, and execution; strong Sassanian influence is present in the portrayal of the little birds, full of gaiety and naturalness, in their slightly irregular circles, and yet another note is to be found—that of the Far East—in the wing-ornament. There is little doubt that the silk was made on a Byzantine loom; but already in the 9th century Sassanian workmen, scattered abroad by the Arab invasions, had brought their work and traditions to the Bosphorus. Mussulmen, moreover, spread over the Far East as far as Turkestan, were carrying eastern design to the West.

There is a strong presumption that this piece, which was used as a seal bag in the 11th century, was woven at Byzantium in the 9th or 10th, by weavers who were familiar both with Sassanian work and eastern designs.

No. 16

Two fragments are all that remain of this seal bag. It contained the seal of a grant, by licence from the Pope and the King, from Walter Archbishop of Canterbury to the Prior and Convent of Canterbury in 1326.

The silk is of a brownish-yellow colour and bears a spread-eagle design of which much more can be seen in the coloured reproduction in the Victoria and Albert Museum than in the piece itself. From that, it appears that the eagles are in circles, between each of which is a triangular space containing a floriated design.

The silk is of a loose and coarse weave, with a brown warp, and belongs to the class of textile known as Regensburg.

In the same glass mount there is a piece of silk which has no connexion with this seal bag. It is executed in a very fine and beautiful weave on a red-brown warp, and recalls good Sicilian work of the 13th century. The background, which is reddish, carries a small diagonal design, and through the middle runs a brown stripe, cut by two white stripes, down which runs a tarnished silver thread.

No. 17 (pl. LII, fig. 2)

No. 17 has no corresponding seal or charter. It consists of two bag-shaped pieces, which each measure $4 \times 4\frac{1}{2}$ in.

Part of the design (of which very little can be seen) consists of a finely executed

¹ Cat. V, and A. 1002.

² Cf. the young birds rising out of the nest—Andrew's *Ancient Chinese Figured Silks*, fig. 15.

palmette ornament—wide at the bottom, and apparently consisting at the top of a fleur-de-lis ending in a point, on either side of which is a blossom on a short curving stem. The palmette ornament seems to repeat vertically. In the example the bottom of one palmette and the top of another can be seen. From the top part extends a long slender branch, from which flowers curve. It ends in a flower, and a rabbit crouches on it. This rabbit is repeated on the other side of the ornament. The rest of the design, evidently, consisted of animals and birds. One great bent paw of a large animal, with discs marking knee and ankle joints, and a circlet round the ankle, is seen beside another paw with hanging claws. Before it, reversed, is another hanging paw, evidently belonging to another animal. Obviously beyond it there was a bent paw, the replica of the first. Possibly the paws belonged to two attacking or addorsed beasts, but too little of the design remains to make a good reconstruction possible. Below the paws meet the tips of the tails of two birds evidently addorsed. On the right is part of the wing of a bird.

The colours are fine and striking. The background is blue, and the design yellow and creamy white. The outlines of the palmette, including those of all the internal curves are blue. The palmettes themselves are yellow and cream. The rabbit is cream colour, and his large eye is outlined in blue.

The paws of the animals are cream-coloured and yellow; the joints, circlet and claws are outlined in blue.

The tail feathers are in horizontal layers of alternate blue and cream-colour, and the cream-coloured parts are outlined in blue. The wing feathers are alternately blue and cream-colour, i.e. one feather is blue and the next cream-colour.¹

The pattern appears to repeat at the point between the two tail feathers and paws which lie immediately above them.

There is no doubt that this piece is of the same date and provenance as no. 18, and is probably from the same loom. The weave is practically identical.

The ankle and knee joints of the beast, as well as the circlet round the leg, point in this direction.

The fine figuration of the palmette, with a slender point apparently curving out widely above and below, also points to Sassanian work, but combined with Central Asian influence.

This is still more strongly brought out by the delicate realism of the little rabbit crouching on its bough.

It is possible that this design, like that of 18, is connected with the gigantic bird called the Garuda in India, the Simurgh in Persia, and the Ruhk² in Arabian legend. He may be holding in his claws the two great beasts, whose hanging paws are seen. This is, however, mere conjecture.

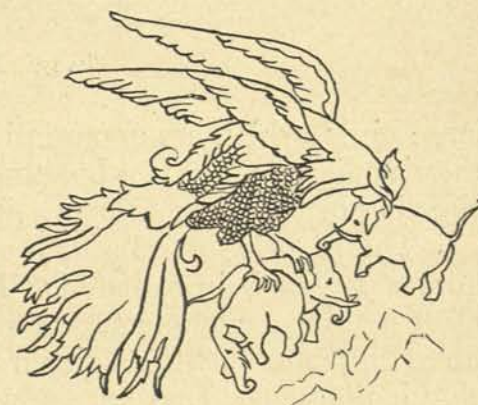


Fig. 12. The Ruhk-bird from Yule's edition of Marco Polo's travels.

¹ For a painted silk bearing a pattern of wing feathers, closely resembling these, cf. *Le Coq, Chotsko*, pl. 50 b. See also note on the Vatican silks, p. 204.

² See accompanying representation (fig. 12) of the Ruhk carrying off three elephants, from Marco Polo, vol. ii, 409 (Yule's edition and notes).

No. 18 (pl. LVII, fig. 1)

Of no. 18 neither seal nor charter are to be found. It consists of two complete rounds, each with a diameter of 4 in. Each round is of the same material, and forms part of the same design.

On the left-hand piece can be seen parts of the heads, bodies, and wings of two

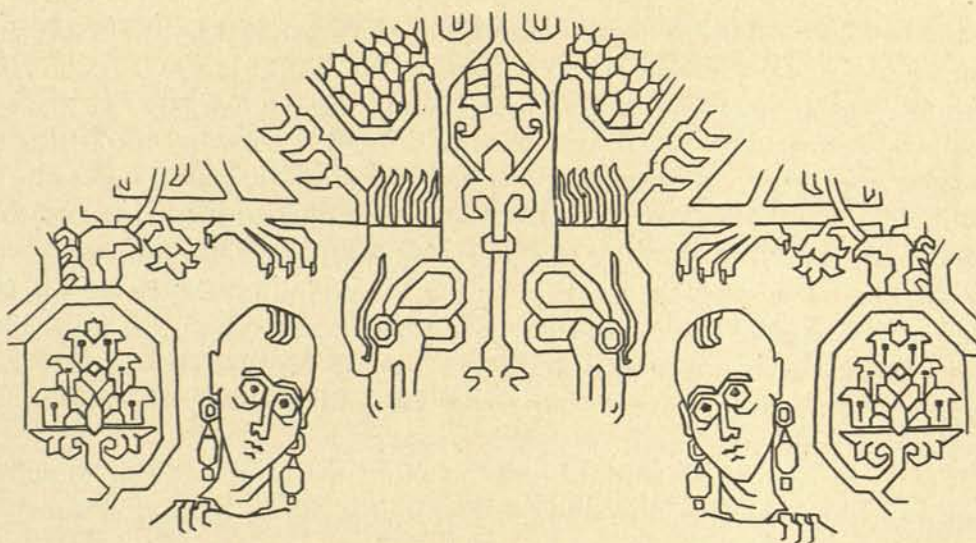


Fig. 13. Reconstruction of design of man and bird.

large birds, which are apparently swooping down on each side of a stylized tree. On the right-hand piece is a human head, and a small part of the head of one of the birds showing beak, eye, and claws (fig. 13).

The head is that of a man of a fine, delicate oriental type. The large eyes give the impression of being dilated. They have hexagonal rims and heavy eyebrows, which meet over the finely marked, rather large nose. The head is shaven, and there are three marks or locks of hair on the top. The mouth is small and bow-shaped, and the chin is pointed. There are pouches or marks under the eyes. The ears have ear-rings with long, oval pendants. Beside the head is a palmette ornament or lotus-scroll, attached apparently to a similar scroll immediately above it. It is probably part of a three-lobed tree ornament. Towards the right extends a branch bearing a delicate blossom, freely flowering, and not stylized. The blossom resembles that of no. 17, but is not identical.

The stylized tree-ornament between the two birds is of a fleur-de-lis and curved design which is frequently found.¹

The birds, which have the strong beaks and claws of birds of prey, are represented with their heads downwards and turned round as though in the act of swooping over their prey. Their beaks are curved, their eyes large, and they have wattles hanging

¹ See no. 23. See also Von Falke, *op. cit.*, ed. 1921, abb. 68, Persian of the 6th or 7th centuries; abb. 137 and 138, Andalusian 11th century; abb. 148, West Islam 12th century; abb. 163, a representation of the Potientien stuff supposed to have been done under Byzantine direction; taf. 5, Palmero 12th century.

down. Their necks and breasts are fringed, and the feathers of their wings are represented by a hexagonal honey-comb design. They have large, spreading claws with strong talons.

The colours are the same as those of no. 17.

The background is blue. The palmette is yellow and cream colour, with its interior leaf ornament outlined in blue. The surrounding scroll is in cream colour and yellow, and around it are small blue circles outlined in yellow, surmounted by curving leaf ornaments of yellow and cream-colour. The extending branch is cream-colour.

The face of the figure is cream-colour, shading into yellow on the top of the head, and the locks or marks are outlined in blue. The eye-brows are blue. The eyes have blue pupils and blue rims. There are blue marks under the eyes. What can be seen of the dress is yellow, and the folds are indicated by blue lines. The features are carefully outlined in blue.

The slender tree is yellow. Rising from the fleur-de-lis which terminates the lower part are two curves which form an oval; it forms a blue field on which leafy curves are represented. The birds on each side of the tree are yellow, and the hanging wattles are outlined in cream-colour.¹ The pupils of their eyes are yellow with blue outlines; the whites are cream colour, and the rims blue. The marks on their heads are blue, as well as their beaks.

The hexagonal wing-pattern is outlined in blue, and surrounded by a cream-coloured border outlined in blue. These blue outlines make the whole design stand out in strong relief. The tails cannot be seen.

This piece, like no. 17, shows Sassanian influence in the palmette and the slender conventional tree-ornament. But the rest of the design points to the predominance of another influence in its execution, and still more strongly in its motif, which is very interesting and unusual. It is extremely difficult to arrive at any satisfactory conclusion as to its meaning.

Many suggestions have to be rejected because they either do not fully explain it or would require the addition of details which are not found in the subject. It has been suggested, for instance, that the head might be that of a Persian widow whose husband's body has been exposed to the birds seen above her. This, however, does not accord with the Magian practice, which did not permit the presence of the widow on the Tower of Silence. Moreover, the ear-rings, the shaven head, and the locks of hair would still remain to be explained.

Again, the head might be, it has been suggested, that of a Mohammedan, bearing the fore-lock left on his shaven head, by which he could be raised to heaven at the resurrection. This, however, leaves the birds out of account, as does also the idea that the head might be that of a Buddhist monk in one of the solitary monasteries which we know existed in Chinese Turkestan.

¹ Dr. Ackermann drew our attention to the resemblance to these wattles of those given in Fischbach (taf. 14, *Die wichtigsten Webeornamente*).

There are also wattles on the peacocks in the famous Hexenstoff from Vich, now in Berlin (Lessing, *op. cit.*, vol. i, taf. 48, and Von Falke, abb. 161). More interesting still, there are wattles on the Ruhk-bird described by Marco Polo. See note on Ruhk-bird, no. 17.

For the final suggestion which seems to meet the case we are indebted to Dr. Thomas, Professor of Sanskrit at Oxford and Keeper of the Indian Institute, who told us in outline the story of the Nagananda, 'The joy of the Serpent World'.



Fig. 14. Indian deity riding on Garuda, from Sanchi rock-relief. Taken from Grünwedel's *Buddhist Art in India*.

The story is a Buddhist legend of the sacrifice of a young prince of a semi-divine race for the rescue of a Nāga, or serpent prince, from his hereditary enemy the Garuda. It is as follows:

Jimūtavāhana was a prince of the Vidyādhara¹ who dwell on the great Himalaya mountains. His father, Jimūtakeṭu, the king of the Vidyādhara, had obtained him from the Wishing-tree which grew in his garden, and had come down to him from his ancestors. It was called the 'Tree of Desires', and was of divine nature, and in answer to King Jimūtakeṭu's prayer it had promised him a son who should 'remember his past birth, be a hero in giving, and compassionate to all creatures'.



Fig. 15. Nāga prince from Cambodia, with hood formed by seven serpents. A 10th-century statue in the British Museum.



Fig. 16. The Garuda carrying off a Nāga. Grünwedel's *Buddhist Art in India*.

And so it came about. Indeed, such tender care had the youth for all men that when he became crown-prince he came to his father and besought him that their Wishing-

¹ The Vidyādhara were a race of super-mortals, independent of man, having kingdom, wives and children like human beings, and possessing magical powers. They were 'spell-binders' and could assume what shape they would. They were at the height of their popularity at the beginning of our era.

tree should be used no longer for themselves, but for the benefit of the poor and unhappy of all the world. Gladly did Jimūtakeṭu consent, with the result that the glory of his family was shed abroad by reason of the benefit they had conferred on mankind.

But their enemies were much incensed thereat, and determined on war. Then Jimūtavāhana persuaded his father to abandon his kingdom rather than resist. And he and his father and mother left their kingdom, and betook themselves to the kingdom of the Siddhas¹ in the Malaya mountains, and made for themselves a hermitage. In course of time, Jimūtavāhana conceived a great friendship for the son of the Siddha king, and desired to marry his sister. The marriage took place with great rejoicing in the presence of vast crowds of Vidyādharas and Siddhas, and Jimūtavāhana and his bride Malayavati lived together in great happiness and prosperity.

But on a certain day when Jimūtavāhana was walking with his brother-in-law on the sea-shore he saw a young man conducted by one, who seemed to be a soldier, to a broad, high slab, where he was left. At a little distance he was followed by one who seemed to be his mother, greatly lamenting. The young man, who was calm and composed, tried to send her away with soothing words, but she refused to be comforted.

Then Jimūtavāhana approached and said, 'Who are you, and why does your mother weep for you?'

And the young man answered that he was by name Śankhacūḍa, a prince of the Nāgas, or Serpent Race, and that he was doomed to death by the Garuda, to whom a Nāga must be given each day for food, according to the command of the Nāga king, who, to save the Nāga race from destruction,² had ordained that each day a Nāga should be sent to his death on the Hill of Sacrifice, so that the whole hill was white with the bones of those who had perished.

'And now,' said Śankhacūḍa, 'it is my turn, for I am a Nāga, and I have been this day sent by the king of the snakes to furnish a meal for Garuda, and to be lamented by my mother.'

When Jimūtavāhana heard this, he was stung to the heart: 'Alas,' he said, 'is this the coward way in which Vāsuki³ exercises his kingly power, giving up with his own hands his people to be prey to the enemy? Why does he not first offer himself to Garuda? But grieve not, my friend. I will deliver you by offering myself. Then shall Garuda, son of Kasyapa, see how great is his sin!'

'Far be this from thee, O great-hearted one,' said Śankhacūḍa; 'why destroy a jewel for common glass? Depart in peace, and I will go in my last hour to worship at the shrine of Siva, before the Garuda comes.'

So he departed, and straightway Jimūtavāhana made an excuse to send his brother-in-law to the house, and hastily donned the robe of sacrifice, and mounted the accursed hill. Then in the air were heard great flappings of wings, and the Garuda appeared, his beak open, and his claws outspread, ravening for his prey. And, seeing the figure on

¹ The Siddhas were, says Tawney, a sort of kindly ghost people who always behaved in a most friendly manner to mankind. They were remarkable for their great purity.

² The origin of the myth of the struggle between the Garuda and the serpent is told in the Mahabharata, i. 16 ff.

³ i.e. the Nāga king.

the hill, he seized him and bore him aloft, striking his head with his great beak so that drops of blood marked the way they went.

But lo! as he bore him away, on the hill fell a rain of flowers, so that Garuda marvelled.

Meanwhile Śankhacūḍa returned, and, seeing Jīmūtavāhana gone, and the upward track sprinkled with blood, divined what had happened and hastily followed the track, hoping to be in time to save his deliverer. And as he went he called: 'Garuda, stop! stop! He is not a snake! Take me! I am meant for you.'

Then Garuda perceived that he was devouring the prince of the Vidyādhara, and, filled with horror, was about to cast himself into the fire to purify his guilt.

But Jīmūtavāhana, full of compassion for all creatures, said, 'Despair not, King of Birds! Only determine never again to eat these snakes, and repent of having killed all these whose bones lie here.'

So Garuda spread his wings, and went swiftly to heaven to bring down nectar for the healing of that wounded prince. Nay, moreover, he sprinkled the whole hill, and the bones which covered it became living Nāgas.

And Gaurī¹ came and rained down heavenly nectar, and the sound of the drums and rejoicings of the gods were heard.

And all that sad sea-shore rejoiced and was crowded with snakes who had come to behold Jīmūtavāhana, so that it became another Pātala.² And the dread of the Garuda was gone for ever.³



Fig. 17. Winged figure from ruined Buddhist shrine at Miran.

The scene represented on the silk is the dramatic seizure of the young Vidyādhara prince by the Garuda. The shorn head with the lock of hair⁴ and the long ear-rings belong to his semi-divinity and his rank. The talon of the bird is on the point of seizing the head and its fierce beak is ready to devour the prey.

On the other side of the slender tree the same scene is enacted, but of the actors only the bird can be seen.

This division by a highly stylized tree belongs to Persian art and is continued in Saracenic and Sicilian art. There is, however, another tree of a lotus scroll design

¹ The Harvest mother, wife of Siva.

² The home of the snakes beneath the sea.

³ For Nāga worship see Fergusson, *Tree and Serpent Worship*. For the Garuda, and the strife between it and the serpent, see Langdon, *Semitic Mythology*, and Grünwedels, *Buddhist Art in India* (ed. Burgess).

On the Sanchi sculpture a Garuda is seen with a Nāga prince on his back. Here the Garuda is the exact facsimile of the dragon on the Tak-i-Bostan rock relief (see fig. 14, in text).

A sculpture, said to be in the British Museum, but which I have been unable to find there, represents a Garuda carrying three Nāga youths.

⁴ Cf. the Miran angel (fig. 17). See *On Ancient Central-Asian Tracks*, fig. 54; Sir Aurel Stein.

beside the young man's figure, which may have a mythological significance and be intended to represent the 'Wishing-tree' which belonged to the prince's family. The branch is stretched out towards the head as if in protection, and the flower droops tenderly over it.

Of course this is purely conjectural, but it seems in unison with the spirit of the story, especially when we remember that such trees had a semi-divinity.

The question of the provenance of this silk is as difficult as its meaning. It has touches of similarity to the textile art of more than one country.

The slender conventional tree design is found in Sicilian art—apparently derived from Persia through the Mohammedan culture. The face bears traces of Byzantine art, but its general feeling, as well as such details as the ear-rings, the shaven head, and lock of hair, mark it as oriental. The expressiveness of the face with its large eyes recalls some of the Egypto-Hellenic textiles of the Antinoë tombs. The lotus scroll ornament with its fine, detailed drawing recalls to an expert on Persian art the palmette ornament of later Persian textiles, and to an expert on Chinese art the textile ornament of China.

It seems to resemble some of the Chinese pottery designs of the Ming dynasty, which, according to Bushell,¹ would naturally be found on textiles of a much earlier period.

It would be natural, therefore, to look for its origin in a country where, at some time in the middle ages, many civilizations met and influenced each other's art.

Such a country we find, we think, in Chinese Turkestan in the 8th and 9th centuries A.D. Already in the 2nd century A.D. commerce between all parts of the Roman Empire and India, Turkestan, and China had developed extraordinarily. Isidore of Charax compiled an itinerary indicating stations and routes between Zeugma (the crossing of the Euphrates) and Bactria. One route went to Seleucia and another through Nisibis. There were also routes by Margiana and Bactria.²

So that three civilizations might by those roads meet and exchange their wares and their arts: India, China, and the Hellenized Orient.

Already in the early Christian centuries there were Buddhist temples in Chinese Turkestan—probably before Christ, for the Miran temples were already vacated in the 3rd century A.D.³

The emperor of China, T'ai T'sung (627-50), welcomed to his court scholars and artists of all nations, among them the Caliphs Osman and Othman and the envoys of the Byzantine Theodosius.

To all this peaceful and long interpenetration of East and West must be added the driving force of the Moslem invasions, which sent the Persians into the Indus valley and into China and Chinese Turkestan, where Zoroastrians, Manichaeans, and Nestorians found a refuge. The last Sassanian prince was received by the Chinese governor of Kashgar.

The fanatical Mohammedan soldiers found their way into Turkestan from the

¹ Bushell's *Chinese Art*, vol. ii, ch. 12 on Textiles.

² See Charlesworth, *Trade Routes of the Empire*; Soothill, *China and the West*.

³ Sir Aurel Stein, *On Ancient Central-Asian Tracks*, pp. 118-27.

south and west, and met in China the peaceful Arabs who had long traded with her from the sea.

We have therefore in Chinese Turkestan all the materials we require for the construction of this silk.

We have Buddhist legend as much at home here as in India.¹ We have the tradition of Hellenic art—possibly Alexandrine—which would give the Egypto-Hellenic type to the features of the figure. We have obviously the presence of Persian and probably also Mohammedan weavers which would account for the Saracenic character of the Persian ornament. The weaving itself is characteristically Persian, a fine twill with two warps, done on a draw loom.

To the question: How a silk woven in the 8th or 9th century in Chinese Turkestan found its way to Canterbury Cathedral at a date unknown, but probably not later than the 13th century, we can give no definite answer.

We know that precious silks were most amazing travellers.

In the case of this one, perhaps the most feasible suggestion is that some trader brought it to Italy, and that from thence it was carried to England either by a Crusader or a pilgrim or a merchant.²

No. 19

No charter or seal is indicated as belonging to this bag. It is a round bag lined with linen and it is laced up at the sides by a plaited braid of pink silk.

It is pink with a yellow design. On one side the design can be made out; it consists of yellow griffins on each side of a foliated stem. The griffins are not confronting; they are in rows and their heads are turned the same way; in the case of one griffin the claws can be seen outspread and the tail curling over his back. The design can be seen better from the coloured reproduction in the Victoria and Albert Museum. The silk is probably Sicilian of the 12th or 13th century.

In the same case in the Victoria and Albert Museum is a coloured representation of a much worn bag—blue and pink in colour with a design (apparently) also of a griffin. It is the same technique as this one, but another piece of silk. It seems to be now missing from the Canterbury collection. It has no number.

No. 20

Missing; possibly the bag, the coloured representation of which is described in no. 19.

No. 21

Plain green silk; tabby weave.

¹ For the Buddhism of China and Chinese Turkestan, which was Mahayana Buddhism, or the Buddhism of the Great Vehicle, see Hastings, *Encyclopedia of Religion and Ethics: Buddhism*.

Sir Aurel Stein points out that the pictorial art of Mahayana Buddhism was developed on the Indian north-west frontier and carried thence through Iran and Central Asia (*Central-Asian Tracks*, p. 219).

² See also Note at the end of the Paper, p. 204.

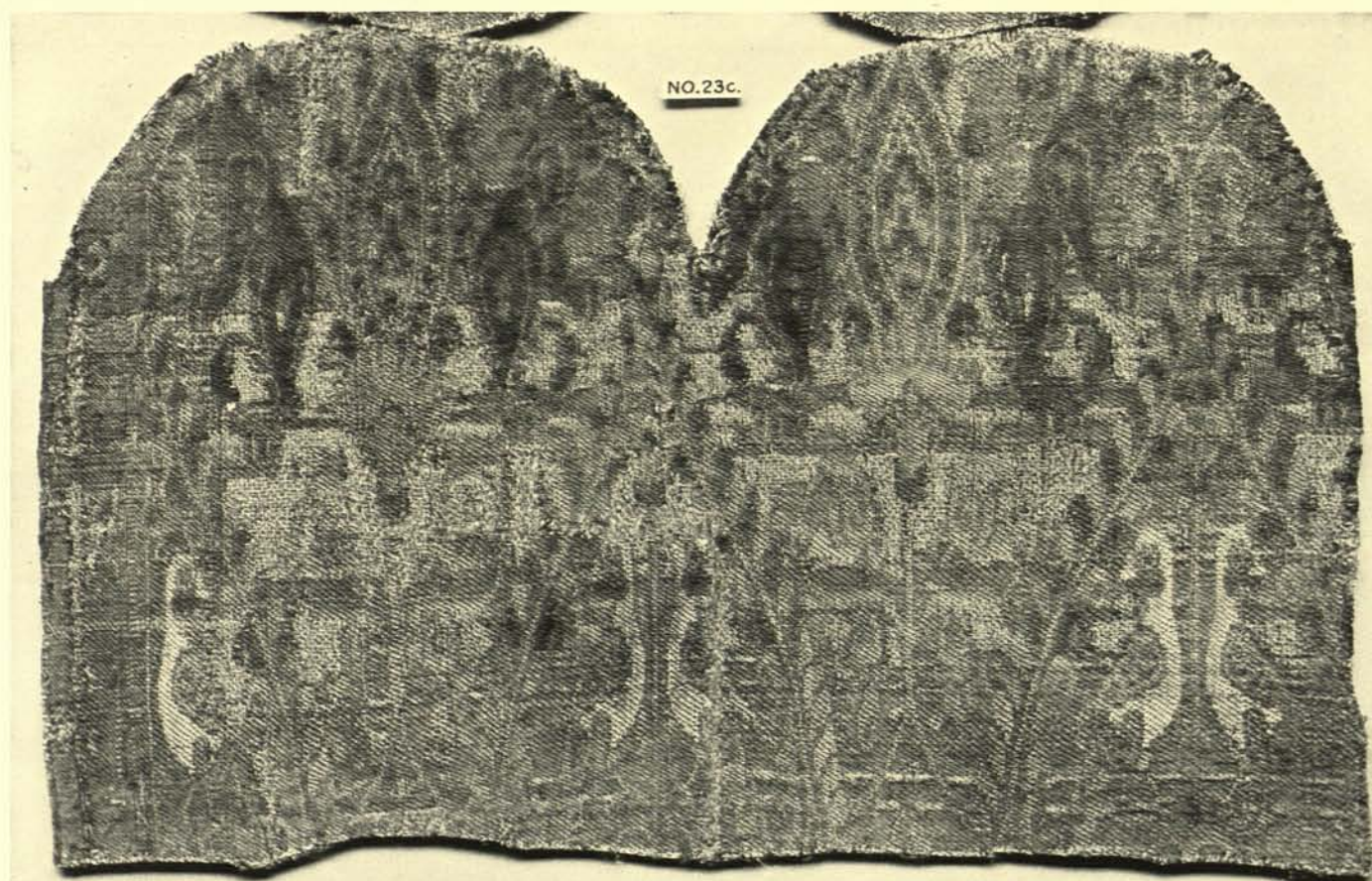


Fig. 1. Seal bag no. 23 c. Griffin and Geese design

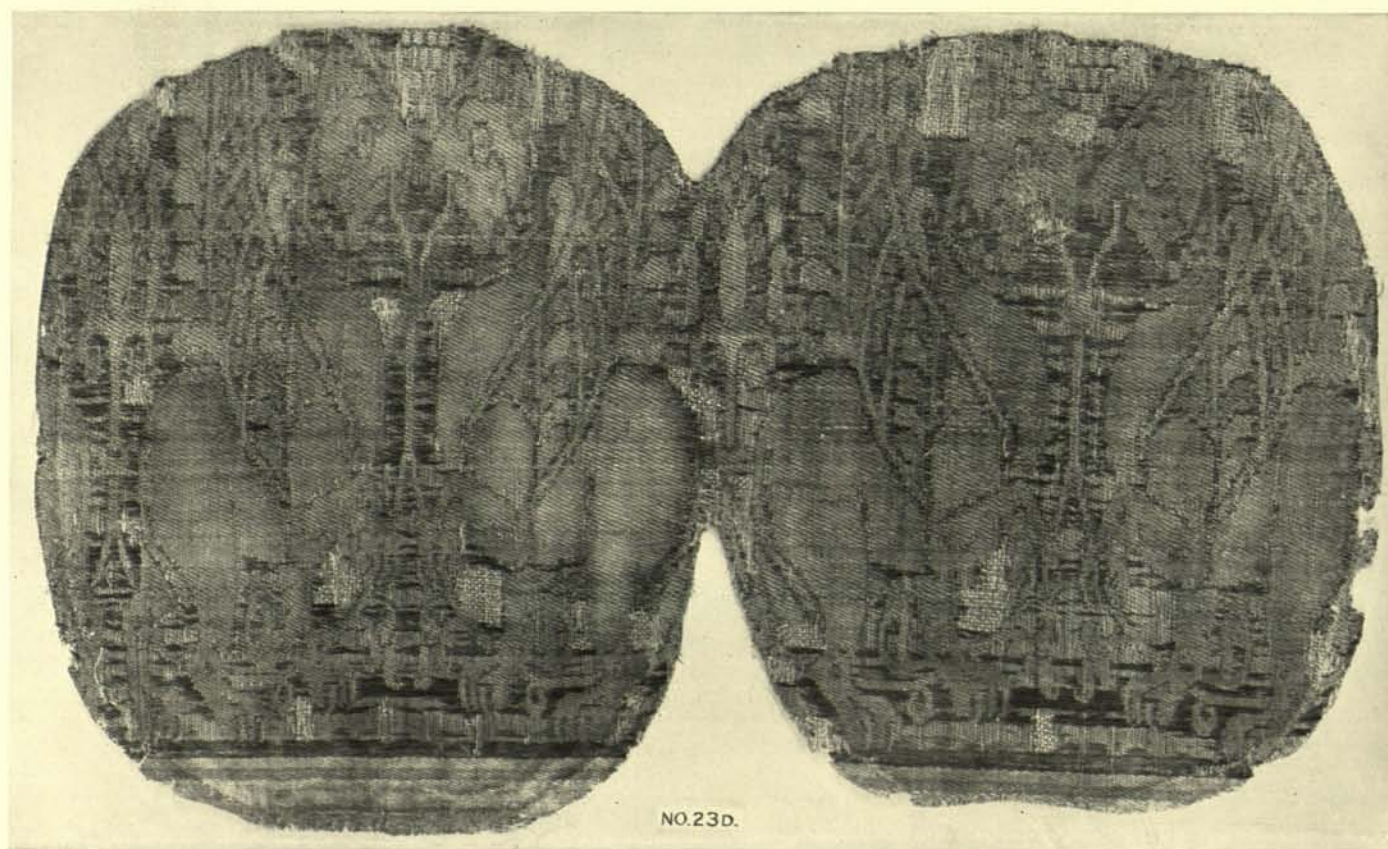


Fig. 2. Seal bag no. 23 d. Design of confronting Griffins

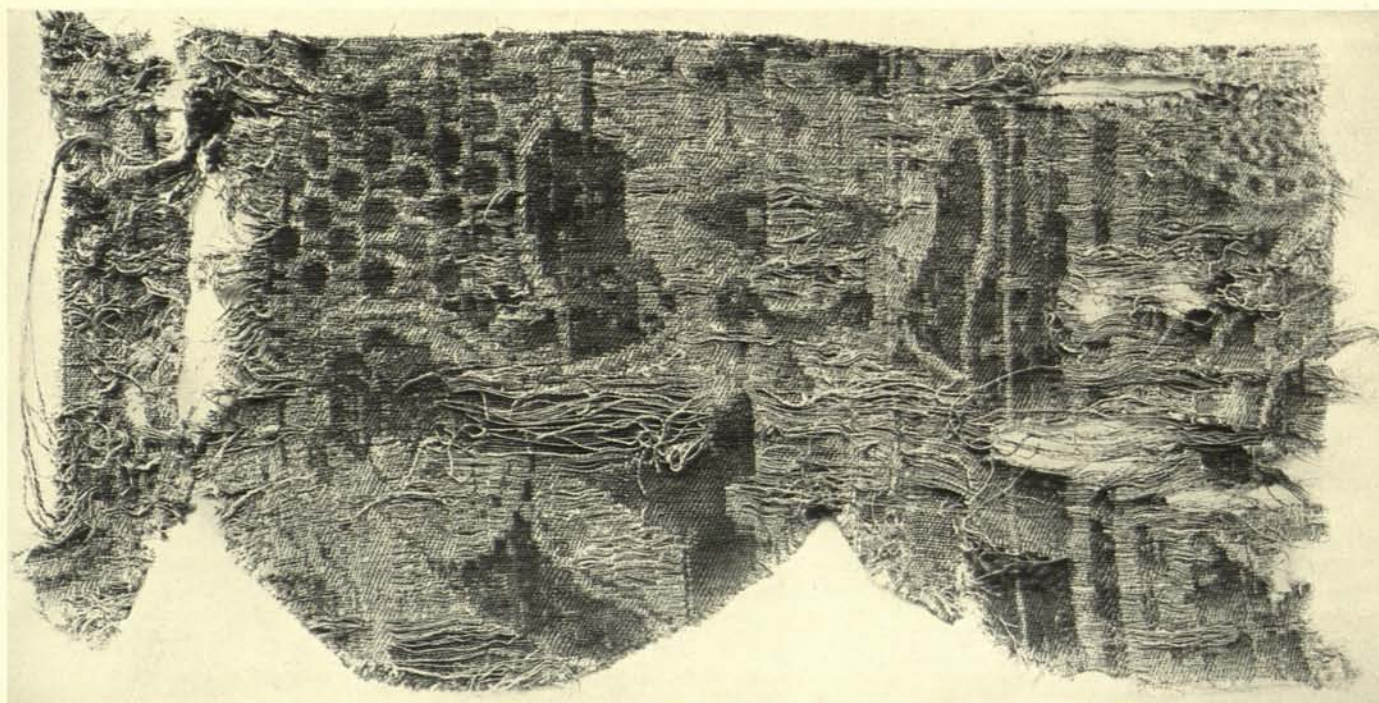
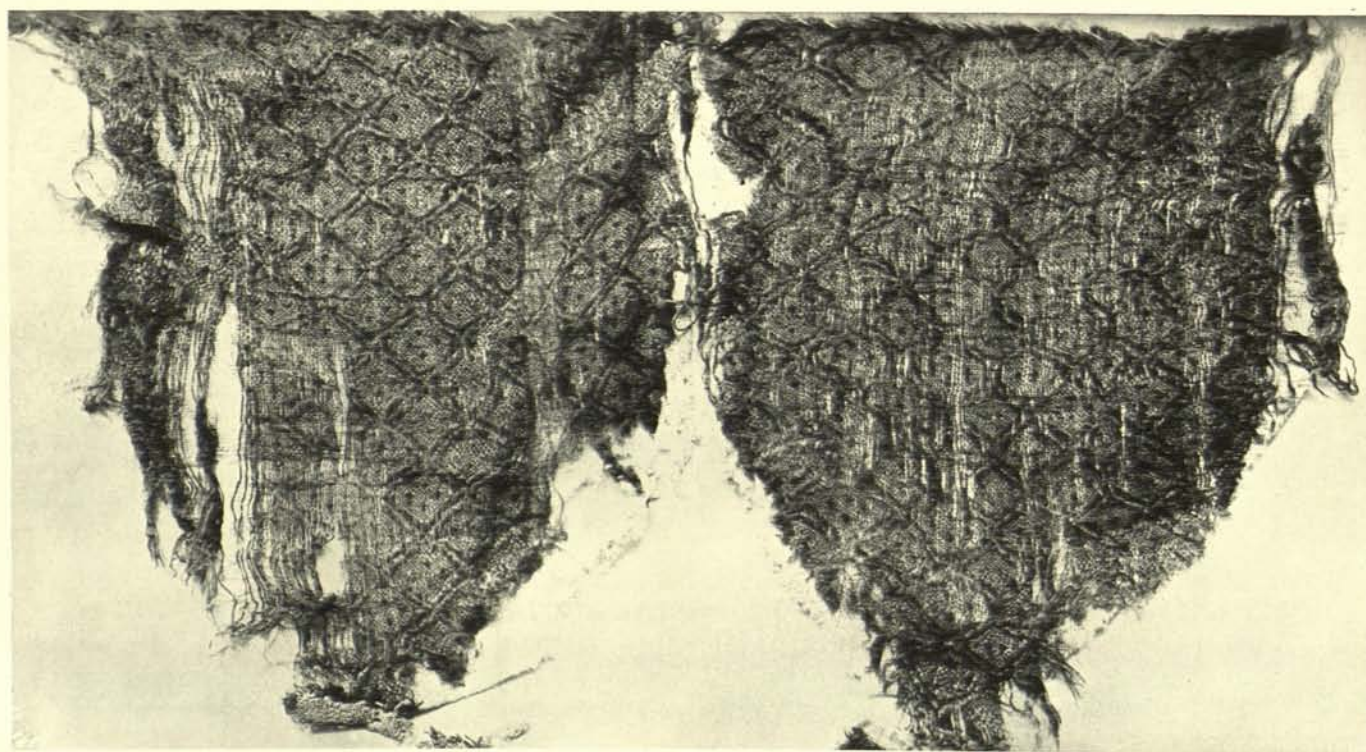


Fig. 1. Seal bag no. 22. Dragon design



*Fig. 2. Seal bag no 30. Trellis-work design

No. 22 (pl. LIV, fig. 1)

There is no seal or charter corresponding to this bag, which consists of one piece of silk, 9 in. long and 5 in. wide at its widest point. It is much worn.

The design consists of a large grotesque animal. The face can be clearly made out. It has triangular eyes, and a large mouth with an upward curve. The face is in white, $2\frac{1}{4}$ in. wide; the eyes are yellow with purple pupils and the ears are leaf-shaped, outlined in purple. On the forehead is a decoration which resembles a star. It has purple eye-brows and purple whiskers. The effect is that of the face of a large cat. To the left is a large curve containing a foliated ornament, perhaps the haunch of the animal, and above is a piece of scaly ornament executed in white on yellow and purple. To the right is a curved tail ending in a leaf-shaped point, filled with zigzag ornament which possibly belongs to another animal. The form of the animal resembles that of the Chinese dragon, of which it may be an Italian copy; note especially the large mouth, the curved haunch, and the scaly body humped up at the side. The scale design which represents feather ornament on many textiles, especially those of Persian origin, is found from very early times representing scales on the dragons of China. There is a magnificent bronze horned beast in Mr. Eumorfopoulos's collection, of 1,000 B.C., covered with scales executed in this manner.

This piece of silk is remarkable, but a great part of the weft is entirely worn away. The whole background appears to have been purple with decorations of yellow and creamy white. Some of the decoration is in lines, some in indefinite shapes of gold and yellow. The animal design was most probably executed in gold and silver, of which only the faintest traces are visible, and only the silk core on which the gold and silver were twisted remains.

Von Falke¹ gives a reproduction of a piece of Chinese work of the 14th century containing two grotesque beasts, one a dragon, the other a lion who appears to be winged, which has decoration very similar to that which appears here.

A good deal of Chinese work was imported into Italy at that time, and a good deal of Italian work was very much influenced by Chinese design.

Nos. 23, 23 a, 23 b, 23 c, 23 d, 23 e (pl. LIII, figs. 1 and 2)

These pieces bear a very close resemblance to one another. They contain the same colours, and the design of each is founded on the same subject but with variations which make it necessary to consider them separately.

Nos. 23, 23 a, 23 b, and 23 d are cut out of the same piece of stuff. The seal contained in the bag no. 23 was the seal of a charter of Edward II, dated 1321. Of the other bags no seals exist. They are all cut in the ordinary bag shape but without join.

They measure: no. 23, length (two parts) $10\frac{1}{4}$ in., width $5\frac{5}{8}$ in.; no. 23 b, length (two

¹ *Op. cit.*, ed. 1921, abb. 272.

parts) $10\frac{5}{8}$ in., width $5\frac{7}{8}$ in.; no. 23 a, length (two parts) $9\frac{1}{2}$ in., width $5\frac{3}{4}$ in.; no. 23 d, length (two parts) $10\frac{5}{8}$ in., width $6\frac{3}{8}$ in.

The design is a complicated one. It consists of griffins confronting one another on each side of a conventional tree, of which they hold a branch in their mouths. The background is dark blue. The colours are dark blue, yellowish green, and red. The griffins have red bodies with bat-like wings, red like their bodies, outlined in yellow and dark blue. They have yellow eyes with dark blue centres, upstanding ears, and collars round their necks. The claws of the four feet are yellow. Each raises a claw. The confronting pairs are separated by a conventional tree consisting of fleur-de-lis and volute ornaments (pl. LIII, fig. 2).¹

Many examples of griffins are given by Von Falke.² One is from the suaire of St. Siviard at Sens, and the piece is said to be Byzantine of the 11th century. A piece from the reliquary of St. Potentien at Sens also contains griffins, and is said to be of the 13th century and to have come from Sicily.

The peculiarity of these griffins is their enormous bat-like wings, which do not appear in any of the other examples.

Lessing³ gives an example in purple and yellow which has the same uncertainty of outline as is found in these silks, and which he considers to be Sicilian of the 13th century. It is probable that these are of the same provenance and date.

Nos. 23 c and 23 e. The design is the same in both these bags. It consists of confronting griffins and geese in rows one above the other (pl. LIII, fig. 1).

The griffins confronting within foliage have no wings; they are much smaller than those in the bags we have just considered. They are entirely red except for their claws, which are yellow, as well as the eyes and collar. In no. 23 c the lower part of the design appears clearly. It is formed of geese standing in ogee-shaped compartments, confronting, with heads turned away, on each side of a slender upright branch. They have creamy bodies and yellow-green wings with dark-blue markings. The colours are fresh and the birds stand out well on the dark-blue background. The silk is in good condition.

It is almost certainly Sicilian of the 13th or early 14th century.

No. 24

There is no record of charter or seal belonging to this bag. It is one oblong piece measuring $11\frac{1}{2}$ by $7\frac{1}{2}$ in. The silk is rich blue as to its background, with a design of foliated branches forming ogee-shaped compartments which contain rosettes, formed by radiating peacocks' feathers alternating diagonally with rosettes of heart-shaped or leaf-shaped ornaments. The centre of the peacock-feather rosette is formed by an eight-petalled flower; the centre of the other ornament is a star surrounded by the eyes of peacocks' feathers. The ogee-forming branches are golden yellow, and the rosettes are white and yellow. The blue weft is much worn away in places, so that the brown warp is plainly visible.

¹ Cf. conventional tree in no. 18.

³ *Op. cit.*, vol. ii, pl. 99.

² *Op. cit.*, ed. 1921, abb. 187, &c.



Fig. 1. Seal bag no. 15. Double-headed eagle



Fig. 2. Seal bag no. 11. Peacocks displayed and animal in foliage

The piece is perhaps from Lucca and of the 13th century. Von Falke gives a specimen of a piece, which much resembles this, from Danzig.¹

There is a good deal of Chinese influence in much of the Lucca work.

No. 25

This is a red silk damask bag, made up and lined. The pattern consists of slightly curved lines which apparently cut through an all-over pattern, consisting of crosses formed by four elongated hexagonal figures whose points meet in the centre. Discs fill in the interspaces. The crosses are contiguous. The two sides of the bag contain different aspects of the pattern. One side shows large foliations apparently repeating. The piece is too small to allow the pattern to be reconstructed. It may be, and very likely is, a piece of the breast and wing ornament of a large bird, such as is represented on the vestments of Hubert de Walter, who died in 1205, which are to be seen in the Cathedral Library.² It may even be of the same silk as the dalmatic, which, though now brown, was originally red damask.

The silk is in excellent preservation. The bag is lined with linen, with a hole for the seal tags, and is bound at the top with red silk-plaited braid.

This kind of all-over diagonal geometric design was often used to ornament the bodies and wings of birds. Von Falke gives many examples.³

The bag measures $4\frac{1}{4}$ by 4 in.

¹ Von Falke, *op. cit.*, ed. 1921, abb. 422. Cf. also Victoria and Albert Museum Cat., no. 700, 1892 (Bock Collection).

² One vestment (the tunicle) consists of a design of eagles confronting in ovals which are filled in with foliage. The ovals touch at four sides. There is a cruciform interspatial ornament with radiating palmette points from each limb of the cross. The birds within the ovals have breast and wing ornament which is like that of the seal bag but is too small to have been the same.

The chasuble, which has evidently been patched together, as some of it is the wrong way of the stuff, has a pattern of two birds in a circle. They are smaller than those of the tunicle and confront on each side of a narrow tree.

The dalmatic has a complicated design. It consists of large birds confronting and regardant in ovals on each side of a narrow stylized tree. There is an inset ornament on breasts and wings. The ovals are enclosed in a circle around which is a hunting scene four times repeated, containing dog and hare in foliation. The hare has its head turned backwards towards its pursuer. The interspaces are filled by a well-marked rectangular ornament with four lobes on each side. Four fleurs-de-lis within it radiate to the four corners alternately with the foliated ornament. The ornament on wing and breast of the bird, which is 11 in. high, is like that of the seal bag, and the size more or less corresponds. The heads and claws of the birds as well as the ornaments that join the circles on all three vestments were probably brocaded in silver gilt, of which some traces remain.

³ The silk is tarnished on heads, claws, and ornaments where the silver gilt has worn off. It was a common thing for the claws of birds and animals to be in gold brocade. See F. Michel, *op. cit.*, p. 32. For elaborate wing and breast ornament on large birds see Von Falke, ed. 1921, abb. 141, the Lyons eagle; abb. 155, the double-headed Siegburg eagle; abb. 180, Kgm. Berlin; abb. 181, the Brixen eagle.

No. 26

Bag made of red leather deer skin. It measures 9×5 in.

At the Record Office in London there are leather seal bags, but they are smaller and of soft white leather.

No. 27

Plain linen bag.

No. 28

Linen bag, with remains of dark brown silk attached. The linen bag was evidently the lining.

No. 29

Remains of yellow silk lining.

No. 30 (pl. LIV, fig. 2)

There is no seal or charter belonging to this bag.

The mount contains four bag-shaped pieces of silk which evidently formed two bags. They are much worn and dilapidated. Two of the pieces measure $5\frac{1}{2} \times 5$ in.; the other two 5×5 in. This silk is of the lozenge diaper or trellis-work design so common in early Byzantine woven fabrics.

The colour is now faded reddish brown. It probably was red, and the lines forming the lozenge pattern were of the same colour. Each lozenge contains four dots, and is $\frac{3}{4}$ in. wide. There are many other examples to be found. We have pieces of a similar pattern, both in the treasure of the Sancta Sanctorum in Rome and in the Chapter Library of Durham. At Sens, in the Cathedral Museum, there is a beautiful piece of red silk of the trellis-work pattern, with nine dots in each lozenge.¹ Again, in the frame marked 'Soieries Sassanides V^{ème} Siècle', is a piece of red damask of this pattern, with a minute star in each lozenge. In the miniatures of the Menologium of Basil II there are numerous examples of fabrics of this design used as garments and as hangings of churches. We may cite, among many others, the following: the altar-covering in the miniature of Zacharias (fol. 14); the covering of the bed on which our Lady is lying at the Nativity (fol. 22); the robe of the emperor at the Invention of the head of St. John the Baptist (fol. 20); the dresses of the executioners on fols. 147, 207, &c.

The pattern can often be seen on the curtain-like wall decoration in Byzantine frescoes.

¹ Cahier and Martin (vol. iii, pl. 15) give an example of a very fine gauze-like silk of purple and yellow of a trellis-work pattern, with small squares containing dots in each compartment, which belonged to the church of St. Leu in Paris. It was wrapped around the relics of St. Helena which were brought back from the East by the Crusaders.

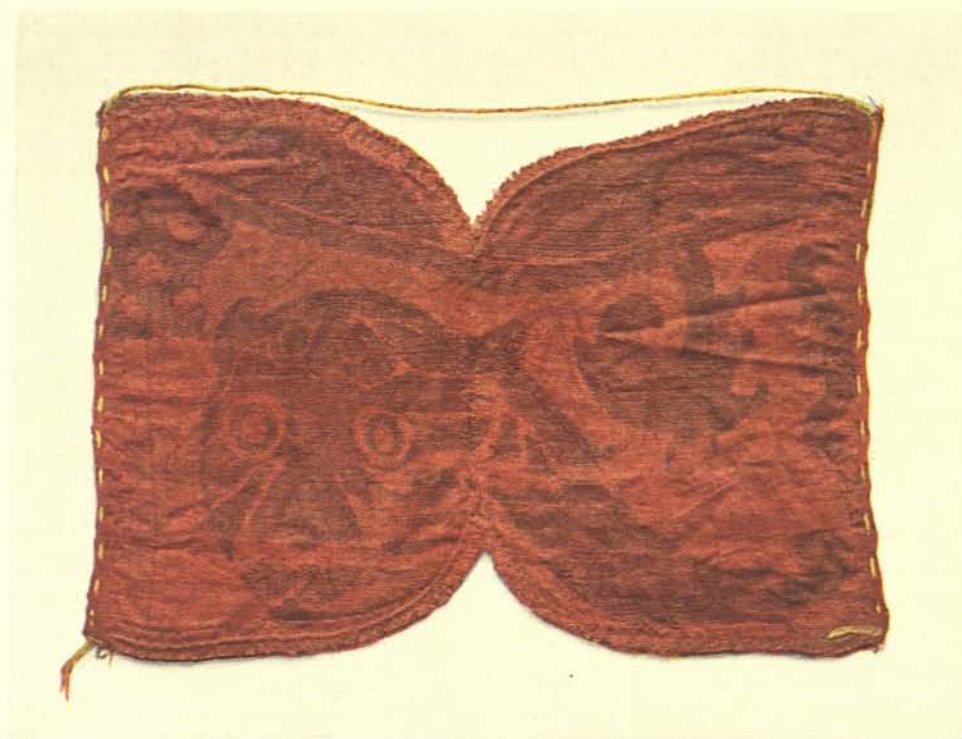


Fig. 1. Seal bag no. 32. Animal's head. Red damask



Fig. 2. Seal bag no. 6. Griffin and bird with heart-shaped ornament

This trellis-design is thought by Stryzowski to show Chinese influence. His opinion is borne out by some of the silks found by Sir Aurel Stein in his excavations in Chinese Turkestan. Mr. Andrews¹ gives examples of very early silks bearing this pattern. One, of a fine all-over trellis design, of which the alternating compartments contained dragons, phoenixes and small birds, was found in the same refuse heap with a document dated 98 B.C. There are others of simple trellis work which belong to the period of the Han dynasty.

The textile is woven in an open way, which gives a gauze-like effect.

This design is very common on the dresses on the early Greek vases of the 5th and 4th centuries B.C.²

No. 31

Plain red silk bag.

No. 32 (pl. LVI, fig. 1)

No charter or seal corresponding to this bag is extant. The fragment is in one bag-shaped piece.

The length is $6\frac{3}{8}$ in., and the width at its widest part $4\frac{1}{2}$ in. The head is $2\frac{3}{8}$ in. long, and the breadth is $2\frac{7}{8}$ in.

The piece is rose-coloured figured silk (it was probably a deep red) with a design of an animal's head, whether lion or tiger it is difficult to say, but most probably a lion. The head is flat and broad, and the ears small. Above the animal there is apparently part of a circle with two ornaments attached. The right-hand ornament is curved like a leaf, with small curly spikes attached; the left hand is a foliation ending in two curves. Beyond the circle at the right hand is a detached ornament, in structure like the left-hand ornament. On the animal's head appears a foliation curving left and right. This piece is almost undoubtedly Byzantine work. A similar piece is reproduced by Mme Errara,³ which is of red silk with yellow decoration. It is said to have been found in the tomb of St. Landrade, who died between A.D. 680 and 690, and to have been part of his robes. A piece of the same kind is found in the tomb of St. Amour, who died in the 9th century.

Lessing reproduces a similar piece which he considers to be Byzantine of the 10th century.⁴ This piece is probably of the 8th century.

No. 33 (pl. LVII, fig. 2)

This bag is without seal or charter. The measurements are irregular— $6\frac{1}{4}$ in. at the longest part, and $5\frac{3}{8}$ in. at the widest.

¹ *Ancient Chinese Figured Silks*, p. 14, figs. 11 and 12.

² Cf. Von Falke, *op. cit.*, ed. 1921, p. 4.

³ Errara, *op. cit.*, 11j.

⁴ *Op. cit.*, ed. viii, 1905, no. 732. See also Sarre and Martin (*Meisterwerke Muhammedanischer Kunst*, München, 1910) for the ornament on the head of the lion.

There is a selvage on the right-hand side.

The silk is a beautiful deep crimson with gold stripes. It is woven in a trellis-work of diamond-pattern lozenges with a small gold 8-petalled flower brocaded in the centre of each. The brocading is done in gold, beaten on vellum, and wound round a silk core.

The piece is most probably of the 8th or 9th century.

No. 34

Plain red-brown silk bag lined with linen.

Nos. 35, 36, 37

Linen linings.

No. 38

Small bag of plain golden-yellow silk.

No. 39

This is a lozenge-shaped bag, lined and bound with yellow braid. There are tassels at two corners and a button of plaited yellow silk. The diagonal measures 6 in. from where the seal entered to the button which closes it, and 4 in. across. The silk is plain red twill, and it is lined with the same stuff. The buttons and the tassels are made of intertwined silk cord.

The date is probably the 17th century.

NOTE

Just before sending to press the proofs of this paper we have, by the great courtesy of Mgr Mercati, been allowed to see the textiles which have recently come to light, and will shortly be made accessible to those who wish to see them in the Vatican Galleries.

With the inclusion of these new treasures, most of them dating from between the 6th and 8th centuries A.D., the Vatican collection of textiles will become of the first importance.

Sir Aurel Stein, who has lately seen them, is of opinion that two at least of the pieces are from Lou-lan. One of them is evidently an example of that plain, thick, Chinese silk mentioned in the *Chronicle* of Ma-tuan-lin (see p. 167); another is a fragment of a very beautiful and mysterious (?) painted silk, containing the leg and claw of an apparently enormous bird.

There is a piece of Byzantine silk quite unique in the unfaded brilliance of its purple dye.



Fig. 1. Seal bag no. 18. Man's head and birds

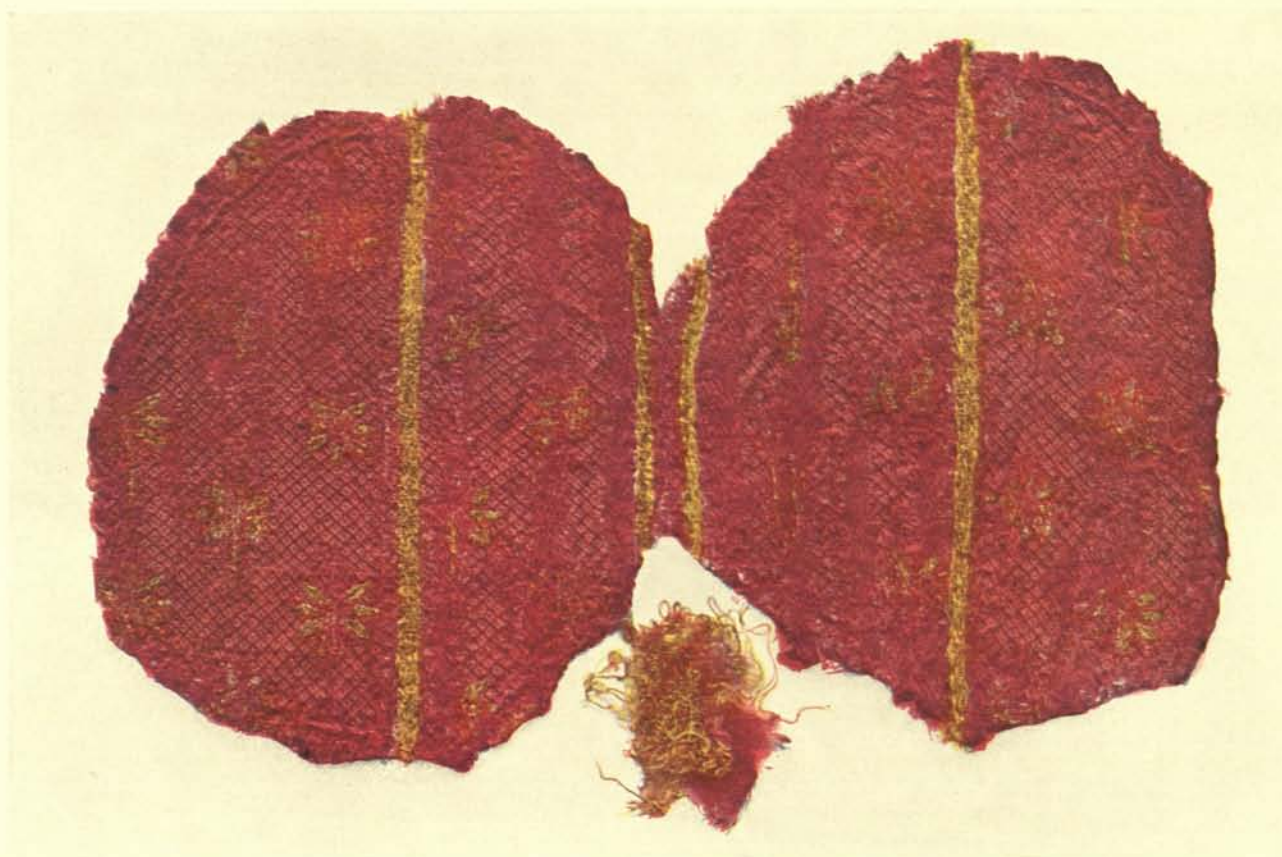


Fig. 2. Seal bag no. 33. Crimson lozenge pattern brocaded with gold

Another piece of a very beautiful rich colouring is woven in a technique which Dr. Volbach believes to be characteristically Persian.

There are, as one would expect, many very fine examples of the trellis-work design.

Dr. Volbach, under whose supervision the work of restoring these fabrics has been done, believes that most of them came from the famous textile market of Jerusalem—the greatest source, between the 6th and 8th centuries, of the silks which have been found in tombs and reliquaries.

His *rendiconto* of these new and most precious discoveries is about to appear in the *Atti dell' Accademia Pontificale*, 1935.

SEAL BAGS IN THE TREASURY OF

APPENDIX

Technical Notes on the Canterbury Seal Bags

By ALICE HINDSON

From the technical point of view the Canterbury seal bags may be arranged in eight groups. In order to discover which group a piece of stuff belongs to, it is necessary to examine it under a linen tester, so that the exact order in which the various threads are arranged may be seen. A linen tester is generally of more use than a magnifying glass, as it limits the area to be examined to an exact measurement. For fine silk pattern weaving a tester giving the measurement half an inch by a quarter of an inch is one of the most useful.

First, it must be discovered which are the warp threads and which the weft; most of the seal bag warps are of natural or fawn-coloured silk, and the wefts of various colours. Other points to notice are: whether there is one warp or two; whether certain warp threads are binding down the weft threads at intervals, and if so, if the intervals are regular, and the size of them; whether the warp threads are rising singly or in couples; the number of warp threads to the inch.

A very good light is essential for examining the stuffs; it is sometimes useful to hold them up to the window and look through them as through transparent paper. By this means quantities of warp threads may sometimes be detected which are otherwise invisible. It is a great help seeing both surfaces of the stuff. It is easiest to count the number of the threads in the ground warp (which appears to be idle) from the front surface, where the pattern weft has been rather worn away; here they may be clearly seen. The threads of the binder warp are best counted from the back surface, whilst the intervals at which they bind the weft are best seen on the front surface when it is in good condition.

On account of the stuffs having been stretched within glass frames, some parts to a greater extent than others, it is impossible to count the number of threads to the inch accurately. So the number of threads given to the inch must be regarded as approximate.

The majority of the figured pieces fall into groups 1, 2, and 3, which are very similar. In these groups the different coloured weft threads float over the warp threads, and are tied down at regular intervals by certain of the warp threads. The tying down of the surface is the same all over. The main differences between these three groups is in the frequency with which the weft is bound down by the warp. By means of the draw-loom harness the weft threads are made to appear on the surface of the stuff only when they are required to form the pattern, and when they are not required in front they are woven in at the back of the stuff.

It is not certain from the appearance of the stuffs which fall into these three groups whether:

A. There are two warps, each with its own back roller, one being entered through lingoes controlled by the simple cords, the other being entered through healds on binder shafts, and controlled by treadles.

Or *B*. There is one warp only, the whole of it entered through lingoes controlled by the simple cords with certain threads taken from it at regular intervals, and entered in addition through healds on binder shafts.

It seems likely that either method would achieve the same result. Each piece, with



Fig. 18. Chinese draw-loom: from a painting in the Victoria and Albert Museum

one or two exceptions, has its ground- and binder-warp threads of the same colour and thickness. It will be assumed that method *A* was used, and so in the diagrams the binder-warp threads are shown by dotted lines to distinguish them from the ground-warp threads. If method *B* had been used all the warp threads would then be shown the same in the diagrams, and the ground and binder threads would be counted as one warp instead of as two.

In groups 1, 2, and 3 the ground-warp threads do not appear to be doing any work at all; they are never interwoven with the weft threads, and seem to be merely padding, as they are invisible both at the front and the back of the stuff until the weaving formed by the weft threads and binder-warp threads is worn away and they are revealed. However, when it is thought out, it will be realized that without them no shed could be obtained for the pattern weft, for it is by raising groups of these ground-warp threads that spaces are left for the pattern weft to float across and form the pattern.

All the stuffs in groups 1, 2, 3, 5, and 6 must have been woven on draw-loom. The stuff in group 4 might have been woven either on a flat loom with several headle shafts

and treadles, or on a simple draw-loom. Groups 7 and 8, consisting of plain tabby and twill weaves (which have not been analysed), would have been woven on ordinary flat looms with two and more headle shafts.

A draw-loom differs from a flat loom in that the draw-loom harness makes it possible to weave repeating patterns of considerable size, great freedom and endless variety, whereas the flat loom limits the range of repeating patterns to the changes which can be achieved in the arrangement of the threads with a limited number of headle shafts and treadles.¹ Draw-loom weaving must be of very ancient origin since the examples of draw-loom weaving found by Sir Aurel Stein in the Lop desert during his third Central-Asian expedition are such exquisite pieces of craftsmanship.

In a 17th-century book on sericulture in the Victoria and Albert Museum² painted on silk there is a detailed painting of a draw-loom (fig. 18) which shows the weaver's assistant, or 'puller of the flowers', as he was called in ancient China, sitting at the top of the loom pulling out each row of the pattern as it was wanted, so that the weaver could weave as uninterruptedly as on a length of plain weaving.

DESCRIPTION OF GROUPS.

Ground-warp threads shown as black perpendicular lines. Binder-warp threads shown as dotted perpendicular lines. Weft threads shown as black horizontal lines.

Group 1, Diagram 1. The weft floats over six ground-warp threads and two binder-warp threads, and is bound down by a third binder-warp thread, and then repeats.

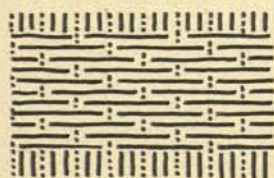


Diagram 1.

more silk weft is packed into the web, and the weaving takes longer and is more exacting.

Nos. 1, 2, 5, 6, 11?, 12, 13, 14, 15, 17, 18, 22, 23 A, 23 B, 23 C, 23 D, 23 E, and 24 belong to this group. Three shuttles are used at the same time in the weaving of most of these pieces. In no. 15 four shuttles are used. As the number of shuttles in use at once increases, the material becomes more costly to produce, for each coloured weft requires its own row of ties on the simple cords,

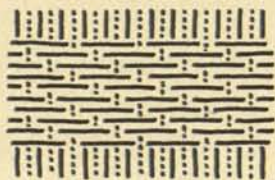


Diagram 2.

Group 2, Diagram 2. The weft floats over three ground-warp threads and two binder-warp threads, and is bound down by a third binder-warp thread, and then repeats.

Nos. 7, 8, 9, and 19 belong to this group. Two shuttles are used in the weaving of these pieces, one for the background and one for the yellow pattern.

¹ *The New Draw-Loom*, by Luther Hooper.

² Original drawings for illustration to *Silk Culture and Manufacture*. Press mark: I. I. 10. D. 1648 to 1658—1904.

Group 3, Diagram 3. The weft floats over four ground-warp threads and three binder-warp threads, and is tied down by a fourth binder-warp thread, and then repeats.

The two coarse pieces on no. 16 belong to this group. The ground warp is of a solid 2-ply thread, whilst the binder warp is of a much finer thread. The binder is entered through a 4-headle harness, unlike the binders of all the stuffs in groups 1 and 2, which are entered through a 3-headle harness.

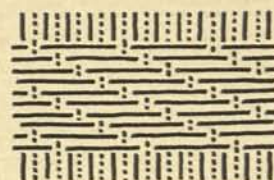


Diagram 3.

Group 4, Diagram 4. The weft thread floats over a few warp threads at a time, sometimes more and sometimes less, to make the pattern, and goes over and under alternate warp threads to make tabby.

Nos. 30 and 30A belong to this group. These are the only pieces among the patterned seal bags which are woven with one shuttle only. The method of weaving is described in detail by John Murphy in his *Treatise on the Art of Weaving* (Glasgow, 1836) in the chapter on 'Lined Work'. Occasionally in pieces nos. 30 and 30A irregularities may be noticed in the weaving (one or perhaps two dots instead of four being woven within the diamond trellis). This is due to the weaver having lost the correct order of the treadling.



Diagram 4.

Group 5, Diagram 5. The weft thread floats over eighteen warp threads, and is bound down by the 19th and 20th warp threads, and then repeats. (Since the warp threads always run in couples, it might be more correct to say that the warp is warped double, and that the weft floats over nine warp threads, and is tied down by the 10th.)

Where the fine tabby is being woven the weft floats over 2 and under 2, over 2 and under 2 (or over 1 and under 1, etc., if considered as warped double).

No. 32 belongs to this group. At first glance it might be mistaken for a damask, but a damask is woven with one shuttle only, and this piece is clearly woven with two shuttles, both carrying silk the same colour as the warp. One shuttle weaves fine tabby and one open tabby, and since the fine tabby is woven right across the stuff between each throw of the open tabby it may be considered as ground; where the open tabby warp and weft, forming the pattern, have worn away, the fine tabby material remains beneath. Had the stuff been damask, if any of the warp and weft had worn away, there would have been a hole in the stuff. From a weaver's point of view it seems likely that this kind of weaving may have led to the invention of the ingenious damask mounture which gives something of the same effect but with a great saving of labour and silk.

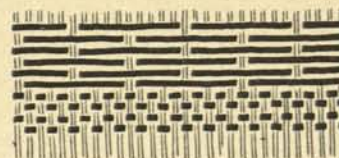
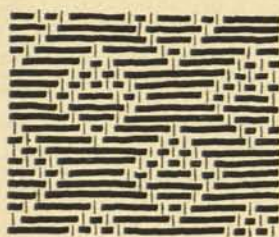


Diagram 5.

Group 6, Diagram 6. The weft floats across several warp threads (varying from 1 to 9), and is tied down by a warp thread where required. There is brocading at intervals of an inch and a half, but this is not shown in the diagram. The diamond pattern might have been tied up on the simple cords or entered on several shafts as in diagram 4.

SEAL BAGS IN THE TREASURY OF



Front.



Back.

Diagram 6.

No. 33 belongs to this group. The weft makes a trellis of crimson of five weft threads floating, sometimes more; within the trellis is a solid diamond of crimson. One would expect to see the weft showing at the back of the stuff when it is hidden by a warp thread in the front; as may be seen from the diagram this is not the case.

	Canterbury Number of Stuff.	Approximate Number of Threads to the Inch.		Repeat.
		Ground Warp.	Binder Warp.	
GROUP I	1	92 threads running in couples, dark brown	46 threads, pale buff	Point repeat, probably $8\frac{1}{2}$ or 9 in. wide
DIAGRAM I	2	off same piece of stuff as number 1		
	5	64 threads running in couples, pale fawn	32 threads very fine and open, brown	Indistinct
	6	92 threads running in couples, threads of both warps identical in colour and thickness	46 threads	
	11?	perhaps 72 threads running in couples, very difficult to see	36 threads, both warps fawn	Comber repeat about $3\frac{1}{4}$ in. wide
	12	perhaps 56 threads running in couples, pale pink, very difficult to see	not counted	Point repeat 2 in. in width, the design very different from the others
	13	perhaps 72 threads, running in couples	36?	
	14	64 threads running in couples, pale buff, both warps of same silk	30 to 32	Point repeat 6 in. wide
	15	80? threads running in couples, very difficult to see	42 threads, pale fawn, both warps alike	Point repeat about 8 in. wide
	17	72 threads running in couples, difficult to see	36 threads, both warps fawn	A large point repeat
	18	96 threads running in couples	48 threads	A large point repeat
	22	92 threads running in couples	46 threads, both warps alike of fawn silk	A large repeat, nothing repeated in width of $4\frac{1}{2}$ in.
	23	from 64 to 96 threads several pieces very	from 32 to 48 threads stretched and shrunk	
	24	dark brown running in couples	dark brown	Point repeat about $4\frac{1}{4}$ in. wide
GROUP 2	7, 8, and 9	50 to 54 running singly, very pale fawn	50 to 54 threads, light brown	Point repeat, about $3\frac{3}{4}$ in. wide
DIAGRAM 2	19	40 running singly	40 running singly	
GROUP 3 DIAGRAM 3	16. two coarse pieces	36 very solid 2-ply thread	36 much finer thread	

	<i>Canterbury Number of Stuff.</i>	<i>Approximate Number of Threads to the Inch.</i>		<i>Repeat.</i>
		<i>Ground Warp.</i>	<i>Binder Warp.</i>	
GROUP 4	30 and 30 A	about 64, one warp only		Point repeat varying from $\frac{1}{2}$ to $\frac{3}{4}$ of an in.
DIAGRAM 4				
GROUP 5	32	one warp only ? 360 threads if counted as single threads: 180 if taken as warped double		A large repeat. $5\frac{1}{2}$ in. does not show any repetition
DIAGRAM 5				
GROUP 6	33	fine natural coloured warp		Gold brocading on a point repeat of about $1\frac{1}{2}$ in.
DIAGRAM 6				
GROUPS 7 and 8	several tabby and twill pieces	not examined		

VIII.—*The Roman Theatre at Verulamium, St. Albans.*

By Miss KATHLEEN M. KENYON, M.A.

Read 8th November 1934

I. DESCRIPTION OF THE THEATRE

THE theatre at Verulamium, near St. Albans, Hertfordshire, was first discovered in 1847, when a farmer called the attention of a local antiquary, Mr. R. Grove Lowe, to some walls in a field adjoining the Gorhambury Drive. Mr. Grove Lowe succeeded in tracing the main walls of the structure and identifying it as a theatre.¹ For its period, the excavation was excellently carried out, but neither the chronology nor the structural history of the building was ascertained. Neither in 1847, nor during slight trenching subsequently,² was anything done beyond uncovering the line of the walls, and it was clear that the original stratigraphical evidence had not been destroyed. It was obviously important that this building, the only known Roman theatre in Britain, should be further examined, and its date, exact position, and plan established. In 1933, therefore, the Earl of Verulam, the owner of the property, was approached. Both he and Lady Verulam at once realized the interest and importance of the site, and not only gave permission for the excavation to be carried out, but on his initiative the Gorhambury estates most generously provided the funds for what was necessarily an expensive undertaking. For this far-sighted and public-spirited action, and for the decision to have the theatre kept uncovered, both archaeologists and the general public owe Lord Verulam a permanent debt.

The excavation was carried out in the autumn of 1933 and the spring and summer of 1934. In the course of that time Mr. H. Asprey, the agent for the Gorhambury Estates, gave much valuable assistance, and the farmers, Messrs. Crawford, were uniformly helpful and obliging. Both in the excavation of the site and in the preparation of the report, Dr. R. E. M. Wheeler's advice has been invaluable. In the course of the work a number of people rendered most valuable assistance, but it is impossible to mention them all. The plans are the work of Mr. A. W. G. Lowther, F.S.A., A.R.I.B.A., who also took charge of

¹ R. Grove Lowe, *A Description of the Roman Theatre at Verulamium, St. Albans Architectural Society*, 1848.

² There seems to have been some excavation on the site in 1883. A proposal to open up a part of the buildings for the British Archaeological Association in 1869 did not materialize (*Journ. Brit. Arch. Assoc.* XXVI, 26 and 184).

the preservation work after the excavation was completed. In the preparation of the report, Dr. T. Davies Pryce, F.S.A., has given great help by examining all the Samian pottery, and has reported fully on the more important sherds. Mr. B. H. St. J. O'Neil, F.S.A., has undertaken the very laborious task of identifying the many thousands of coins found, with the exception of the hoard of 800 minims, which has been studied by Mrs. R. E. M. Wheeler, F.S.A.

Site of the Theatre

The theatre lies in the northern half of the city of Verulamium. This region has so far hardly been excavated. It lies within the probable area of the first-century city, whose boundary has been traced on the north and west sides, and on the south probably passes not far from the south side of the theatre. The east façade of the theatre fronted on to Watling Street, the main north-south thoroughfare of the city, which lies at this point almost exactly under the modern Gorhambury Drive. The quarter was clearly one of important public buildings. On the south side the theatre is separated by one insula, as yet unexcavated, from the Forum of the second-century city. On the west, within a large precinct, lies a temple of the Romano-Celtic type,¹ which seems to have lasted from the early second century to the late fourth century. On the east side, east of Watling Street, is a large structure, obviously a public building of some sort, whose excavation remains to be completed.

As will be seen, the original building of the theatre belongs to the second quarter of the second century, and it would be expected that considerable traces of first-century buildings would be found underneath. Since the theatre was partly sunk into the natural soil, much of these possible remains were destroyed, but even in the part where the levels were not so destroyed, only scanty traces were discovered. The robber trench of one possible wall south of the stage buildings, and one floor beneath the south-east portion of the *cavea*, alone suggest any structural remains. Beneath this wall was an occupation layer containing a coin of Cunobelin,² and native and early Roman pottery. Another coin of Cunobelin, together with one of Claudius I, came from a possible ditch north of the theatre, while a well-defined ditch south of the theatre, probably belonging to the earlier road which would have followed that line, was clearly filled in only immediately prior to the construction of the theatre, and contained pottery running down to c. A.D. 125, and an illegible *sestertius* of Hadrian.

¹ *Transactions of the St. Albans and Hertfordshire Architectural and Archaeological Society*, 1934.

² Described, with the other Cunobelin coin here mentioned, in the forthcoming Report of the Society's Research Committee (no. XI).

Summary of Periods (pl. LXVII)

The Verulamium theatre exhibits four main periods in its construction. The first phase was a simple structure, with obvious aberrations from the normal classical theatre which will be discussed later (see below, pp. 242 ff.). This can be dated about A.D. 140 to 150. Period II involves major structural alterations in the endeavour to approximate the building to the normal type. This is not very much later than the original building, about A.D. 150 to 170. The alterations of period III are comparatively minor, and do not affect the general form. They date early in the third century. Period IV (c. A.D. 300) is one of general reconstruction and enlargement after a period of decay. Subsequently, a few small alterations were made before the building went out of use as a theatre in the fourth century. It was then used as a rubbish pit.

Period I (pl. LXVIII)

The original form of the theatre at Verulamium was very simple. The essential feature was that the orchestra was completely circular. This was surrounded for more than three-quarters of its circumference by the *cavea*, the basis of which was an earthen ramp built up from the gravel excavated from the sunk orchestra, and retained by a buttressed exterior wall. In the area not occupied by the *cavea* was a small and rudimentary stage, fronting on to the circular orchestra wall. The *cavea* was pierced by three broad gangways, one opposite the stage, and the others on the transverse diameter.

Cavea. In the process of construction the first wall to be laid out was the external retaining wall of the *cavea*. This was built free, both inside and out, above the level of the pre-theatre surface, and as the earth was excavated from the orchestra, it was piled up against the back wall. The highest part of the wall, as preserved, was 3 ft. thick, broadened below by a brick-capped offset of 9 in. Outside the west gangway this offset was at the ground level (pl. LIX, fig. 1), but since this level drops gradually towards the east and that of the offset remains constant, the offset was well above the ground level by the time the south gangway was reached (pl. LIX, fig. 2). The wall was supported by a series of shallow buttresses 3 ft. wide at intervals of approximately 12 ft., and projecting 2 ft. beyond the offset. Opposite each buttress, and also intermediately, were placed wooden posts about 1 ft. in diameter, at a distance of approximately 6 ft. from the ends of the buttresses. These posts may merely have been those of a surrounding fence, like the smaller ones protecting the triangular temple in the southern half of the city, but they are so substantial that it is possible that they supported an encircling wooden gallery, resembling the stone ones found

elsewhere, for instance in the very scantily excavated theatre in the Rue Racine at Paris.¹ The stumps of the posts were still in position when the later outer wall was built at the end of the third century, for a number shows in the matrix of the trench-built foundations of this wall, while others were pulled up and the holes filled with stones.

In each of the rear segments was one larger buttress, 5 ft. 9 in. broad and projecting 5 ft. 6 in. from the offset. These broad buttresses were undoubtedly the supports of external staircases, probably of wood, and were the only means by which the seats of the *cavea* could be reached in the first period. Such external staircases were common in amphitheatres,² but are not found in theatres of the classical type.

Round the south-east section ran a wooden water-pipe, sealed by the earliest road surface connected with the theatre. A number of the iron collars joining the lengths of wooden pipe was found in position. The purpose of the pipe is unknown. It was destroyed when the buttresses were extended in period III a in alterations to the external staircase (see below, p. 231).

On the east side the ends of the encircling wall terminated in large piers (pl. LVIII, fig. 2) which probably supported some architectural feature. In the overlying debris near the north of these piers was a large block of limestone dressed on two adjacent faces, which may well have come from it. The dimensions of the stone were 3 ft. 9 in. by 2 ft. 3 in., and its thickness 1 ft. 6 in. On one side was a cramp slit 7 in. by 2 in., 1½ in. thick. In the original plan the side wall of the *cavea* was carried straight across to the stage buildings from these piers in two parallel walls 3 ft. apart, joining the stage walls at their junction with the orchestra wall and just behind that point respectively. These may have carried stairs. The effect from the east would have been of straight façade, with a small rectangular stage building projecting in the centre.

A study of the plan makes it quite clear that in the eastern segments the majority of the seats, whose curve must have followed that of the orchestra wall, would have had almost no view of the stage. They would have faced towards the centre of the orchestra and away from the stage. This tendency of the seating arrangements was accentuated when the original east walls of the *cavea* were pulled down and their places taken by single walls, carried across on an oblique line to join the stage walls, thus adding another section to the *cavea*. The seats in this additional area were directed even more towards the orchestra and away from the stage than in the original plan. For this reason the oblique side walls, for whose date no stratigraphical evidence could be obtained, are assigned to a sub-period of period I. As will be seen, in

¹ F. G. de Pachtère, *Paris à l'époque gallo-romaine*, pp. 66-8.

² e.g. Pompeii, *Pompeii, Its Life and Art*, Mau, trans. Kelsey, pp. 212-26.

period II the stage grows in importance, and the orchestra was partially given up to seats. It is inconceivable that at the same period a portion should be added to the auditorium which would have an excellent view of the stalls, but practically none of the area where any action was taking place! The significance of the arrangements of the auditorium is discussed below (pp. 242 ff.).

Much of the ground into which the foundations of the surrounding wall were built had little or no deposit from earlier occupation. In two places, however, earlier deposits were found. The theatre was surrounded by a gravelled road or open space, into which ran the roads bounding this insula. Beneath the earliest surface of this road on the north-west side was a deposit, possibly in a ditch (uncertain because its lip was obscured by the loose gravel filling of a late sump pit). The deposit included native and early Roman pottery, and one coin each of Cunobelin and Claudius I. The other deposit fortunately gives a closer date. A ditch approximately 3 ft. 6 in. deep and 8 ft. wide, possibly belonging to the pre-theatre road, was traced for a considerable distance along the south side of the theatre. This was filled in before the construction of the outer wall of the theatre, and in this filling a considerable amount of pottery was found. The earliest Samian form was a fragment of an early form Ritterling 12, which is usually pre-Flavian. There were a number of fragments of form 37 of the Flavian period, and of forms 18, 27, and 35 which are probably approximately contemporary with them. A base of form 33 had the stamp of the potter *PATERCLI*, who worked in the Domitian-Trajan period. A number of sherds of form 37 belong to the Trajanic period, and the latest sherd found was a form 37 which can be dated *c.* A.D. 125-30 (fig. 9, no. 2). The coarse pottery found agrees in date with the Samian, and includes mortaria with upward-curving rims, poppy-head beakers, and first-century reeded-rim bowls. With this pottery was a worn *as* of Vespasian (M. & S. 762)¹ and a worn *sestertius* of Hadrian *c.* A.D. 130 (type illegible).

From beneath the original ground level outside the theatre, but against the free-built portion of the wall and therefore contemporary with the construction, came an *as* of Hadrian *c.* A.D. 125-8 (M. & S. 678) rather worn. The pottery included early second-century examples of form 27, 33, 18/31, Curle II, a form 37 of A.D. 100 to 120, and another of *c.* 125 (fig. 9, no. 1). The coarse pottery included Flavian and Hadrianic reeded-rim bowls, a late first/early second-century ring-necked jug, and a mortarium of the first half of the second century.

The evidence of the pottery from these two groups would not require a date later than *c.* A.D. 130 as the earliest at which the theatre could have been built. The presence of the two rather worn coins of Hadrian of *c.* A.D. 130 and

¹ The coins are identified either by reference to H. Mattingly and E. A. Sydenham, *Roman Imperial Coinage*, or H. Cohen, *Monnaies frappées sous l'empire romain*, 2nd edition.

125-8 respectively, however, would seem to require a rather later date, probably between A.D. 140 and 150.

Since the modern field level was in parts only a foot above the Roman street level outside the theatre, most of the upper portion of the *cavea* has disappeared. Only at the lowest portion, immediately against the orchestra wall, was anything approaching the original angle of the ramp preserved, and nothing could be deduced as to the arrangements of the seats and the existence of any gangways or *precinctiones*. The seats themselves would certainly have been of wood. In a district which produces no freestone, any other material would have been prohibitively expensive. Though stone seats were usual in stone-built theatres, completely wooden theatres were quite common, and indeed had been the rule in Rome up till the middle of the first century B.C., so that the provision of wooden seating would not have appeared unusual. Similarly, the stone-built amphitheatre at Caerleon had wooden seats, although in an area where stone was readily available.¹

Orchestra. The circular orchestra was separated from the *cavea* by a wall at least 4 ft. high. It was found standing to this height in places, with the foot of the seating ramp sloping up steeply from that point, and there must have been a balustrade or some similar barrier above that. Unlike the normal Roman theatre, where gangways lead from the orchestra up the whole height of the *cavea*, there was no connexion between the two at Verulamium. The orchestra wall was built against the natural soil into which the orchestra was sunk, and a hole into which the peg was driven for the final laying out of the circle was still visible. Traces of cement floor remained over the area, of varying thickness. This may have been all that was provided, or it may have been the basis of a wooden floor. In the centre was a cross-shaped cutting, with arms approximately 10 ft. 6 in. and 9 ft. 6 in. long, 1 ft. 6 in. broad, and 6 in. deep. At the point of intersection was a slightly deeper, round depression, in which had obviously stood an upright, supported by the two bed-plates, which were themselves pegged down. The purpose of this upright, whether a maypole, gibbet, or post to which baited beasts could be chained, can be only a matter of surmise.

A means of disposing of the rain-water which would accumulate in this sunken area was provided by a well-built drain, 3 ft. 9 in. high and 1 ft. 4 in. broad, in the north-east corner. This carried off the water in the direction of Watling Street, but its outlet could not be traced.

Gangways. Access to the orchestra was obtained by three broad gangways, which in the first period served that area only. These were placed opposite the stage and on the transverse diameter. They would have been

¹ *Archaeologia*, lxxviii (1928), 116-17.

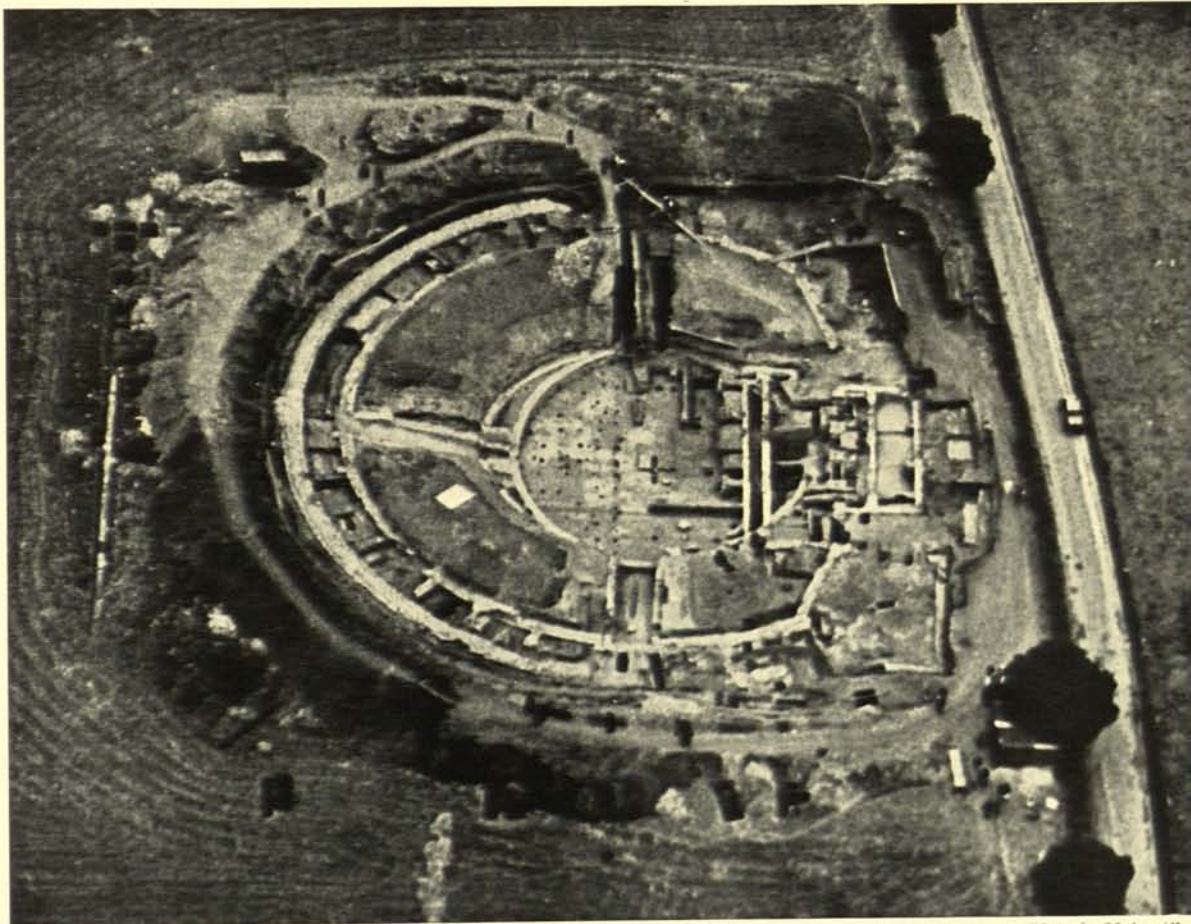


Photo. by Major Allen

Fig. 1. Air view of theatre

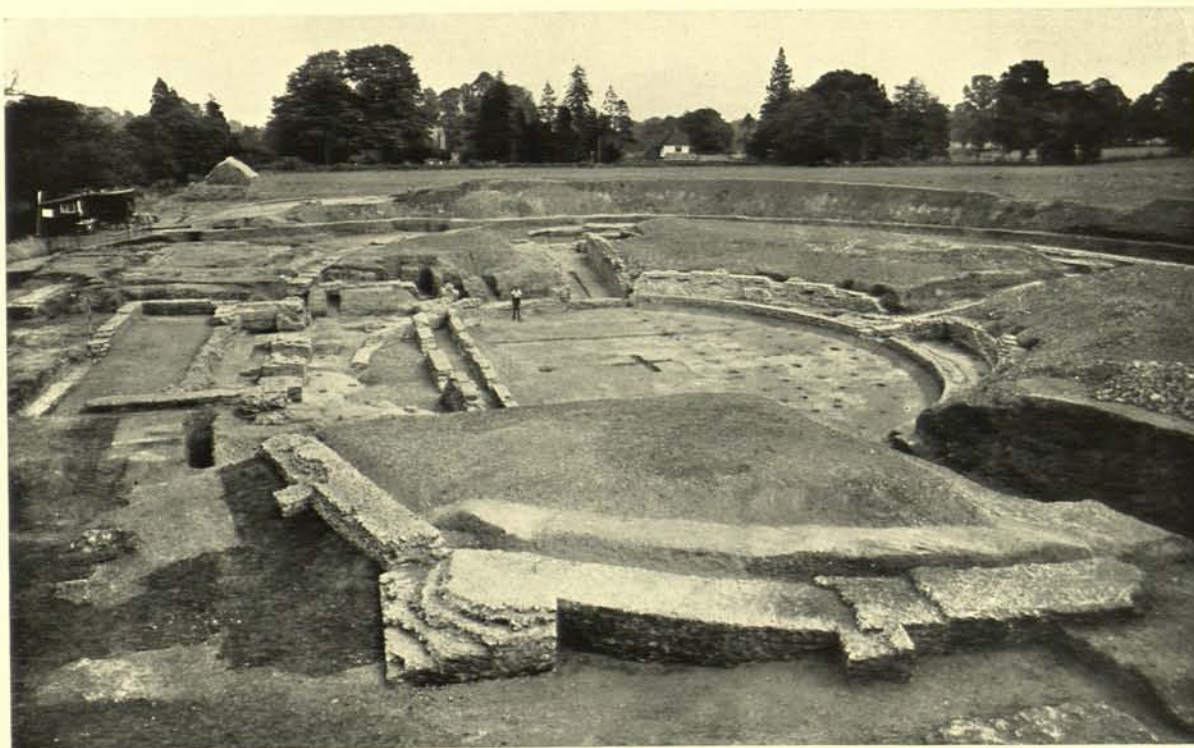


Fig. 2. View from north, showing pier at north-east angle of *cavea*



Fig. 1. View from west, showing buttresses and offset of Period I wall



Fig. 2. View from south, showing supports of external staircase

partially vaulted over to carry the upper seats of the *cavea*, but no trace of the vault remained. That on the west side, opposite the stage, was 7 ft. 6 in. broad. An error was made in its laying out, as instead of its centre being sighted on the centre of the orchestra, its north wall is on that alignment. The surface of the gangway was of extremely hard cement 6 to 8 in. thick, with a camber towards the side walls. The back wall was carried across the entrance as a sleeper wall. The gangway could be closed by a door at the foot, where jambs projected 1 ft. from the side walls, overlying a wooden door-sill.

The south and north gangways were 9 ft. 9 in. broad. The walls of the south gangway were standing to a maximum height of 6 ft. 6 in. above the original surface, but no trace of the spring of the vault was visible. This maximum, however, was reached only in the lower part of the gangway, which would presumably have been open. Higher up, where it would almost certainly have been roofed, the walls were only 5 ft. high. A thin film of cement covered the natural soil, but it seems probable that the actual surface was of wood. This is suggested by the fact that in the lower half of the gangway was cut a slot 1 ft. deep and 1 ft. 6 in. broad, which probably held a heavy timber carriage to which the timber surface was anchored (pl. LX, fig. 1). A similar device was certainly employed in the lateral stairways of the second period (see below, p. 226). If this was the use to which the slot was put, the corresponding timber of the upper part of the gangway must have been slighter, and not cut into the ground, possibly because it was here under cover. The slot was certainly sealed by the second period floor. The doorway in the south gangway was at the top; post holes for double doors were found immediately inside the sleeper which carried the back wall across the gangway. There seems to have been a step up over this sleeper from the outside, which would be a natural device to prevent water draining in from the external road.

The arrangements of the northern gangway were almost certainly similar to those of the southern, but it had been so destroyed that few details could be made out. The walls had been robbed to their foundation courses, with great wide robber trenches which obscured all details. Also the levels here were of made-up soil, which has subsided in a remarkable way. The ground has dropped right away beneath the sleeper of the back wall, while the floor crossing its top, which has remained in position over the wall itself, has dropped outside in a manner resembling a geological fault. The result is that there is a continuous series of repairs and make-ups.

With the exception of this gangway, where the subsidence of the earlier levels had confused the evidence, the gangways and the orchestra were cut into the natural soil and rested on no earlier deposits, so no additional dating evidence was obtained from them.

THE ROMAN THEATRE AT

Stage. The plan of the stage buildings in the first period is simple. The curve of the orchestra wall is continued across its front, though not to its full height. Its maximum existing height in front of the stage is 3 ft., but there is no evidence as to the original height. In the centre, however, it was never carried above the level of that part of the stage, for it is covered by the cement floor, and there were probably central steps down into the orchestra. The side walls of the stage (which also retain the end of the *cavea*) bond into the orchestra wall, that on the south side on the axis of the stage buildings, while that on the north was a compromise, obviously an error of laying out, between being on that axis and being radial to the orchestra circle. For some reason, these walls, at a distance of 13 ft. from their junction with the orchestra wall, set in towards one another, narrowing the stage from 48 ft. 6 in. to 44 ft. 6 in. Farther back, a wall divides the stage proper from a shallow room or post-scenium of the same width as the stage. The floor of this room is 2 ft. 6 in. higher than that of the back of the stage, so there must have been one or more flights of wooden steps leading down, as this was the only way in which the stage could have been reached. The dividing wall was robbed too low to enable the positions of the doorways to be ascertained. A gap in the back wall suggested that there was probably a door in the centre of it.

The floor of the stage or *pulpitum* was of wood. The surface of the ground beneath was covered with a thin layer of mortar, which also lined the sides of the holes in which were placed the uprights supporting the floor boards. These uprights were 9 in. square, tapering to 3 in. square, and were driven about 1 ft. 9 in. into the ground. The use of wood for the floor of the *pulpitum* was normal in the classical theatre, as it was supposed to improve the acoustics. It was possibly to increase the resonance that at Verulamium the earth beneath the centre was hollowed out to a depth of approximately 1 ft. 6 in. below the general level. The sides of the hollow were apparently revetted with timber, and it was lined with cement. The space provided by this hollow does not seem sufficient to conceal mechanical devices or allow of subterranean appearances. The height of the wooden floor is of course unknown. If it was level all over, as is probable, the maximum required is 3 ft. 6 in. above the bottom of the hollow, and it is unlikely to have been any higher since that was the height in the second period when the level of the orchestra was 1 ft. 6 in. higher than in the first period. Moreover, at least part of the area must have been taken up by the steps down into the orchestra, though it is most improbable that the whole area was, since that would have left practically no level space at all on the stage.

The area of the stage proper was cut down into the natural soil, so all earlier deposits were removed. In the room at the back, however, beneath

the gravel make-up of the earliest floor, there was an occupation layer from 6 in. to 1 ft. in thickness, resting on a yellow gravel layer, possibly a pre-theatre floor, with the original turf line beneath it. From the occupation layer came two coins of Trajan, a *sestertius* of A.D. 103-11 (M. & S. 489), in fairly good condition, and a *dupondius* of A.D. 98/9 (M. & S. 398), in good condition. The pottery associated was mainly Flavian, and included sherds of form 37 not later than A.D. 80, another *c.* A.D. 90, a rim of form 29, *c.* A.D. 80, and fragments of forms 27 and 18 of the same date, one of the last form having the Flavian potter's stamp CARILLI M. The coarse ware is of the same late first-century date. This group of coins and pottery therefore is slightly earlier than that sealed elsewhere by the theatre.

Arcade. There seem to have been no other rooms connected with the theatre in the first period. There was, however, some monumental structure between the eastern façade and the adjacent Watling Street. A heavy foundation 6 ft. in width belonging to this period was placed centrally with regard to the stage, at a distance of 6 ft. behind the rear room. This runs to the edge of the modern road, and reappears on the farther side. A robber trench 6 ft. wide, 25 ft. farther south probably represents a similar foundation. It is possible therefore that there was an arcade or other monumental screen along Watling Street at the rear of the theatre, but more clearance remains to be done on the east side of the road to settle the matter.

Architectural details. Little evidence was found as to any architectural details belonging to the first period. Very few architectural fragments were found. A number of saddle-backed coping-stones of Rutland oolite (see section 7, p. 261) was sealed by the second-period orchestra floor. The width of the only fragments measurable was 2 ft. 4 in. and 2 ft. 2 in., with thicknesses of 11 in. and 7 in. In the mortar debris left beneath the second-period wooden floor of the stage, and therefore presumably belonging to period I, was a fragment of a carved cornice or bracket (pl. LXVI). This is particularly interesting, as it preserved traces of the paint which would originally have covered all the architectural features. The whole is coloured bright yellow, while the carved acanthus leaves are picked out in dark red and orange. On the orchestra wall were traces of green wall plaster, as low as 1 ft. 5 in. above the first-period floor. As that is lower than required by the period II floor at that point, and the lower edge is irregular and probably broken, this should be part of the period I decoration.

Summary of dating evidence for period I. The latest group of pottery sealed by the theatre is that in the ditch on the south side (see p. 217), which is predominantly Flavian in date. The latest sherd from this dates *c.* A.D. 125-30. The latest group contemporary with the theatre (see p. 217) is mainly

of the early second century, with the latest sherd *c.* A.D. 125. The coin evidence, however, seems to bring the date of the theatre rather later, since in both these groups was a worn coin of Hadrian, one of *c.* A.D. 130 and one of 125-8. Since the coins would only become thus worn after a considerable time, the building of the theatre is unlikely to have taken place before A.D. 140 to 150.

The period of this first building is therefore that of the big expansion and rebuilding of the city which excavation has shown to have taken place between A.D. 130 and 150 in the whole of the area as yet examined. It is the period of the construction of the city walls, which in style closely resemble those of the theatre. In fact, it is just at such a period of prosperity that the construction of a 'luxury article' such as a theatre would be expected.

Period II (pl. LXIX)

This period was one of major structural alteration. The stage was made much more elaborate, and increased in size, and at the same time half the orchestra was given up to seating accommodation. New access was made to the *cavea* by lateral staircases off the south, and probably the north, gangways. All these alterations clearly represent a considerable modification in the use of the theatre, and in effect relate it more clearly to the classical type. This question is discussed in detail below (p. 246).

Stage. The external walls and the *cavea* remained, as far as is known, unaltered, and as the main modifications affect the stage, it is convenient to deal with that first. Across the front of the stage between the points of junction of its side walls with the orchestra wall, was built a wall forming a chord of the orchestra circle. Unlike the side walls of the stage, which are bonded in, this wall is built up against the orchestra wall, and its foundations are trench-built to the depth of a foot in earth against the free-built face of the orchestra wall, overlying its foundation spread. There is therefore no possibility of it being part of the original building scheme. Two gaps in the wall give possible positions for stairs down to the orchestra.

The construction of this wall added a considerable area to the stage. Some of this was, however, discounted by the construction of three piers, about 4 ft. 8 in. square (the dimensions vary slightly) at a distance of 5 ft. 3 in. in front of the back wall of the stage. These were rather roughly built for the bottom foot, but above that the corners were turned in brick, and there were also brick lacing courses. The maximum height to which they were standing was 3 ft., with a probable set-back at 2 ft. 9 in. These piers doubtless carried columns, in imitation of the normal *scaenae frons*, and a portion of a Corinthian capital (fig. 1) and a fragment of necking 1 ft. 8 in. in diameter were found



Fig. 1. South gangway



Fig. 2. Stage from south, showing original curved front wall and later straight ones



Fig. 1. Stage, showing Period II columns



Fig. 2. Orchestra, with post-holes of Period II seating platform

near the front of the stage. These were in the debris covering the latest floor, and must have been in use in the latest period, but from the style they may well date from the second period. The proportions suggest columns about 19 ft. high. At the same time as these piers were built, nibs or responds pro-



Fig. 1. Fragment of capital from column at back of stage.

jecting inwards were added where the side walls of the stage set in towards one another. These would have carried pilasters or engaged columns. These nibs, and the facing added to the side and back wall at the same period still preserve their rendering of cement and the coat of yellow wall-plaster with which it was faced. The bottom of this gives the level of the floor at this period.

The floor of the stage was still of wood, and the same post-holes were employed. A certain amount of loose mortar debris was left lying round the piers, but the dating evidence from period II in this area is scanty. A curious feature is that in between the new front wall, and the portion of the orchestra wall now covered by the stage, a large excavation (pl. LXXII) was made into the natural soil, to a depth of about 3 ft. 6 in. below the original lowest point of the ground beneath the stage, giving a depth of about 6 ft. below the presumed height of the period II wooden floor. The circular orchestra wall was partially destroyed by this pit, the sides of which were left completely rough and unfaced. It was certainly cut after the construction of the period II front wall of

the stage, and it was filled in in period III, the floor of which seals it, but it cannot be dated more closely. There are two possible explanations of its use. One is that it corresponds to the sunk portion beneath the period I stage floor, and was to increase the resonance of the stage. The other is that it was to facilitate drainage. In support of this last theory is the fact that two small trenches were cut running into it, one on the south side, and one between the central and southern piers, cutting through the original orchestra wall in the process. It is not very probable that it was for use with trap-doors and similar devices, since in that case it would hardly have been left so extremely rough and unfaced.

The dating material from the stage for period II is naturally very scanty. There were no datable sherds, but one *sestertius* of Trajan, of A.D. 112-14 (M. & S. 624), in fairly good condition, came from the mortar debris belonging to this period.

Orchestra. The other main alteration of period II affected the orchestra. The floor of period I had been immediately above the natural soil. It was subsequently raised 1 ft. in the centre, to 1 ft. 9 in. at the edges, by a layer of sticky brown earth, capped by a floor of hard orange sand, which in parts had the remains of a cement surface. The actual junction of this floor with the period II front wall of the stage was destroyed by the period III front wall and the row of holes described below (p. 225). The level, however, is that required by the stage wall, and was definitely cut into by the period III wall, so it may safely be taken as belonging to period II.

This hard sand floor extended only over half the orchestra, and ended on the line of the western walls of the lateral gangways. Here its edge was lined by a row of post-holes, and the area between that line and the wall to the west was covered by a network of similar holes. The posts were a Roman foot square, tapering to about 3 in. square, and were driven about 3 ft. into the ground at varying angles. It is clear that these are contemporary with the sand floor, since it is obvious that the builders who were prepared to drive these posts some three feet into the natural soil would not have cleared away a foot or so of soft soil on top of it, if that had already existed in that area. The first level that ends against the post-holes—that is to say, the sand floor and brown earth make-up—is therefore the one that is contemporary with them. The actual space round the posts seems to have remained empty, since the filling round the stumps was contemporary with the period IV floor, the posts being cut down to a height just sufficient to be covered by this floor.

The purpose of the posts was clearly to support a platform with additional seats. It is highly probable that it was arranged in the low broad steps usually found in the orchestra of the Roman theatre, on which were placed the thrones

or arm-chairs of the senators and local notabilities. Absolute evidence of this of course is lacking, since the posts were all cut down in period IV to a common level. There is no suggestion that the west gangway went out of use at this period, so steps up from it must have been arranged at the back.

Besides the platform, seven holes, approximately 2 ft. across, cut through the yellow sand floor. They were arranged fairly regularly, with one in the centre 12 ft. from the period II stage wall, two others the same distance from that wall, and 5 ft. from the orchestra wall, with the others lining up with them at right angles to the stage wall. The holes probably held posts. These had been removed, and the pits filled in and sealed by the period III floor. There is therefore nothing to show whether they were something connected with the period II theatre, or merely a temporary structure during the period III building operations. The material in their filling is period II in date.

From the sticky brown layer beneath the sand floor came an *as* of Hadrian, A.D. 125-8 (M. & S. 668), in fairly good condition. The Samian forms were early second-century examples of form 33 and 18/31, a 31 of the first half of the second century, and an Antonine form 37 of c. A.D. 140-60. Earlier sherds surviving included a 37 of the Domitian-Trajan period, and another of the late first century, and first-century types of 18 and 29. Among the coarse pottery were some Trajan-Hadrian reeded-rim bowls, several Hadrian-Antonine ring-necked jugs, an early second-century mortarium, and an imitation of form 18/31 in ordinary black ware. From the sand floor itself came a number of sherds of 18/31 and 31, of the early second century down to the Antonine period, a number of second-century forms 27, and a form which is probably a Ludovici T.g. of the Antonine period. The coarse forms were Hadrianic reeded-rim bowls, Hadrian-Antonine ring-necked jugs, and a vertical-sided mortarium of the first half of the second century.

These two groups together suggest a date between A.D. 150 and 160 for the second period.

Curtain-slot. Immediately in front of the period II stage wall was found a line of eight large holes, going down to about 4 ft. below the period I orchestra floor, and 5 ft. 6 in. below that of period II. The depth below the probable height of the second-period stage floor was 8 ft. 10 in. It is tempting to see in these holes the places where stood the telescopic posts which would support a curtain to hide the stage (see below, p. 243). They are in exactly the right position, and are about the same depth as some of the continental examples. The difficulty of this interpretation is that of course a wall is required in front of the curtain as well as behind it, to conceal it in a slot when it is lowered. The wall at Verulamium which is in exactly the right position for this was, however, undoubtedly built after the holes were filled in, and belongs to

period III (see section, pl. LXXII). The explanation probably is that it took the place of an original wooden outer wall. In support of this is the fact that at the north end, where a gap was left between the end of the outer (period III) wall and the orchestra wall, the period IV blocking of this gap was built over a wooden post, which has since decayed. In the filling of one of these holes was found an iron counterpoise (pl. LXIV, fig. 2), weighing 154 lb., which was probably part of the curtain-raising mechanism. Presumably, the apparatus was found to be unsatisfactory, and the holes filled in. Apparently, however, the outer wooden wall and the simple slot without the posts was retained, for nothing resembling a floor crosses the filled-in holes. It may have been found possible to operate the curtain without the posts, for the slot would still have been 3 ft. 3 in. deep below the stage floor. The outer wall of period III would be merely the replacing of the wooden wall by a stone one, and the fact that both were rebuilt in period IV suggests that the double wall had still a function, and it was not a case of the supersession of one wall by the other.

The holes were not part of the original plan of period II. The front wall of the stage of this period shows remains of two coats of red wall-plaster, which would not have been necessary when the wall was hidden by the curtain slot. Also the holes cut through the trench-built foundation of the period II wall, leaving them exposed. The holes were, however, filled in considerably earlier than period III. The only coin from this filling was an extremely worn *as* of Trajan (type illegible). The majority of the pottery, however, is Hadrianic, and the Samian forms included a form 37 of A.D. 110-20 and one slightly earlier, two 18/31 sherds of 110-120, an early second-century reeded-rim bowl, several Hadrian-early Antonine ring-necked jugs, and a poppy-head beaker. The filling-in, therefore, would not appear to be much later than period II itself, and the posts must have been a temporary experiment, soon abandoned.

Gangways. The only other alteration carried out in period II was in the south gangway, and probably in the destroyed north one as well. The gangway walls were cut through immediately inside the entrance, and lateral staircases made leading up to the upper seats. They are clearly dated in this period by their relation to the raised level in the gangway, which equates with the period II level in the orchestra. The level of their sills agrees with this. Also, after the wall was broken back to make them, the jambs were refaced, and this refacing, which shows clearly, was covered by the rendering which belongs to the period II floor.

The sides of these stairways against the seating ramp seem to have been revetted with wood, some of the post-holes of which were found. The surface, which must from the angle have been in steps, was also of wood, and the slot into which the main timber carriage was sunk was found.

The surface of all the gangways was raised in this period, but only in the filling in the southern gangway was much datable material found. The Samian from this level formed a definitely early group, extending to *c.* A.D. 100, obviously imported *en masse* from an earlier deposit. With it was an illegible *as* of Domitian.

The vault over the west gangway seems to have been rebuilt at this period. In the second floor level, with their tops incorporated with it, was set a number of large stones which almost certainly served as stands on which to rest posts supporting centring. They were some of them sunk some distance into the period I floor in order to make their surface horizontal. In between the first and second floors were traces of shavings from the planks of the centring, the grain of the wood being preserved in the cement floor which was laid over them. It cannot be said with absolute certainty that this rebuilding of the vault belonged to period II rather than to period III, for since the floors of the gangway led on to the wooden platform, they could not be connected stratigraphically with the orchestra floors, as could be the floors of the other gangways. The pottery sealed by the floor was a very small fragment of form 37, of indeterminate date.

External walls. The external walls remained unaltered in this period, and the level of the road was for the most part the same, except where there were patches over small subsidences caused by the decaying of the wooden water-pipe mentioned above (p. 216).

Wings. It seems probable that rooms were first added at the eastern angles in period II. Neither the separation of the various phases of the wings nor their attribution to the periods of the main building was at all easy, since the surfaces were in most cases ill defined; the walls of the earlier periods were removed in the later, and most of the area was covered by the tessellated pavement of period IV, the remains of which it was not desired to destroy. Evidence was only available with regard to the south-east wing. As mentioned above, the north-east angle was built on made-up soil, in which considerable subsidence took place. The disappearance of the walls of the wing was surprisingly complete, but its original existence can be presumed from the fact that the period IV outer wall stops there at the same point as on the south side, which presupposes the existence of the wall of the wing against which it ended on this side.

The south-east wing was certainly additional to the original structure, its walls being built against the buttresses of the outer wall with butt-joints. Three periods seem to be identifiable in the building. The latest is contemporary with period IV, and involved a complete rebuilding. The buildings which underlay this period IV wing seem to belong to two different phases,

presumably periods II and III of the main building. The original wing seems to have been merely a square room, connected by a single wall to the south-east pier of the theatre. The walls of this room seem to be earlier than a layer which in its turn is definitely earlier than the other walls of the wing to the south and west.

The actual dating material was very scanty. One coin only was found in the layer into which the east wall of the room was built, a second-brass of Aurelius as Caesar under Antoninus Pius, of A.D. 154 (M. & S. 1322, p. 184), in mint condition. The pottery was indecisive, but would not be inconsistent with the ascription of the room to period II.

Summary of the dating evidence for period II. The evidence for the dating of this period comes from the make-up of the floors of the south gangway and orchestra. The former contained only an imported earlier group, but from the orchestra floor came a group of Hadrian-Antonine and Antonine pottery, with the latest sherds running down probably to c. A.D. 160. The coin evidence in this case does not extend the dating, since the only coin certainly belonging to the period is one of Hadrian, A.D. 125-8, in fairly good condition, from beneath the orchestra floor. The connexion of the original portion of the south-east wing with this period is not sufficiently certain for the coin of Aurelius under Antoninus Pius to be used as dating evidence for the whole building. It would appear, therefore, that period II dates soon after A.D. 160.

Period III (pl. LXX)

The additions of period III did not affect the main structure of the theatre. The floor levels almost everywhere were raised, but the only new walls were in the stage buildings. It was obviously a period of general repair, but no great structural modifications.

Stage. The main new feature in the stage was a new stone front wall 3 ft. 6 in. in front of that of period II, probably taking the place of a wooden one (see above, p. 226). At the south end this wall swings forward, having a wing projecting out into the orchestra, and leaving a gap of 2 ft. 3 in., broadening to 3 ft., between it and the circular orchestra wall. This was probably designed to support a stairway up on to the stage. At the north end the wall has a squared end, stopping 4 ft. 6 in. short of the orchestra wall. This may have been to permit access to the curtain slot or connected with drainage.

At the same time the front of the stage was extended sideways, giving a total width of 72 ft. 6 in. (as compared with the original 48 ft. 6 in.). The oblique side walls of the *cavea* were cut back to the point of junction with these new walls, and presumably an entrance was made on to the stage here. Previous

to this, of course, one cannot have existed, since the bank of the *cavea* must have come right up to the side walls of the stage. The junction of the new side walls with the orchestra is curious. On the line of the new front wall, a massive block of masonry was built against the back of the orchestra wall, with a face on the line of the inner face of the new front wall. That returned on the line of the new side wall, but in between it and the rest of that wall was a gap of 2 ft., with the corners turned in brick to a level considerably below that of the contemporary floor of the stage. What the purpose of this opening was is not clear. It may have been connected with the manipulation of the curtain. Another possibility is that there was a side entrance to the stage from the *cavea* here. If there was a similar arrangement on the north side it would have rested partially on the drain, but the side wall here was completely destroyed.

The space beneath the stage was in this period filled up solid with earth. The lower part was mixed debris, some of it dark occupation earth, and some bricks and building rubbish, while above it all over was a layer of gravel. Over the deep hole on the front of the stage (see above, pp. 223-4) all this filling had sagged badly, the top layer dropping as much as 3 ft. This probably did not matter, since there seems still to have been a wooden floor. On the sides, at any rate, the lines of parallel timbers on which the surface boards would have been laid are visible in the gravel make-up, together with one hole of a short upright (plan, pl. LXX). In the centre, over the subsidence, the surface was too broken to show similar traces.

In this make-up were a very worn *as* of Titus under Vespasian, A.D. 77-9 (type illegible); a worn *as* of Domitian (type illegible); a *denarius* of Trajan, A.D. 103-11 (M. & S. 119), rather worn; a worn *as* of Hadrian (M. & S. 546 b); an *as* of Antoninus, A.D. 154-5 (M. & S. 937), in good condition; a worn *as* of Faustina II, died A.D. 175 (M. & S. (Marcus Aurelius) 1647/8); and an illegible second-brass of the first or second century A.D. The pottery group accompanying these coins was large. The Samian forms were a considerable number of examples of forms 31 and 33, mostly late in character, including one with the stamp of the Hadrian-Antonine potter, ASIATICI M., a second-century 36, a late 27, a Curle 15, a form 45 of c. A.D. 150-60, an Antonine 37, and one dating about 130-50, and a number of imitation Samian forms, including an imitation 38, an imitation 31, and a flanged bowl, which must date near the end of the second century. Among the coarse pottery was a considerable amount of Castor ware. There was also a mortarium with a drooping rim of the late second century, and one with the stamp $\frac{?}{VICIL(I)}$. In both coins and pottery this group covers a fairly wide range, as is to be expected with material

imported to raise a level, as this was. The terminal date is, however, clearly early in the third century, to which the period III alterations may therefore be ascribed.

Orchestra. No structural alterations were made in the orchestra in this period. The posts supporting the seats remained in use, and in that half of the area there are no deposits which can be attributed to this period. In the eastern half the level was raised about 6 in., with a floor partly of gravel and partly of sand.

The pottery from this make-up was all Antonine, down to about A.D. 180. The forms represented were several sherds of 33, 31 (including one of c. 180), 38, and 44. The coarse pottery included a mortarium of the Antonine period and several fragments of Castor ware. The only coin was an extremely worn early *dupondius* of Hadrian. The material from this area, therefore, was not so abundant, but agrees in date with the period III filling of the stage.

Gangways. In each of the gangways the floor was raised to a level corresponding to that of the orchestra. The pottery from these levels included a form 45 of A.D. 170–220, a late second-century 31, together with some earlier forms. From the south gangway came a worn *sestertius* of Hadrian (type illegible). The addition to the west gangway at this period seems to be only a patch at the top and bottom, if the second floor belonged to period II and not III (p. 227), and from it came a Walters form 79 and a late second-century 31. The corresponding make-up of the north gangway contained Samian forms 37, 38, and 33, all probably Antonine, and some Castor ware, together with a worn *as* of Vespasian (A.D. 71, type illegible).

Surrounding road. The level outside the walls was also raised in this period, presumably to correspond to the raised level of the gangways. From this level came a coin of Faustina I (died A.D. 141) in good condition (M. & S. (Antoninus Pius) 1154 ff.), a much corroded denarius, probably of Septimius Severus, and a large group of Antonine pottery. There was a considerable number of sherds of forms 31 and 33, and examples of 18/31, 38, 35, 27, including one with the stamp *HABILIS F.* The examples of form 37 include one of about A.D. 110–25, one of 110–30, and one of 160–70 (fig. 9, no. 3). There was also the base of an imitation Samian mortarium. The coarse forms were a few fragments of Castor ware, a Hadrianic reeded-rim bowl and a ring-necked jug of the same period, and a mortarium with down-curved flange of the late second century. The general date is late Antonine, probably down to the end of the second century. The latest coin was in a very bad state, but was not later than Septimius Severus.

Wings. It was probably in period III that additions were made to the south-east room encasing it on the south and west sides. The levels would

suit those required for this period, and the walls, as shown above (p. 228), appear to be later than those of the square room. They are certainly earlier than period IV, the outer wall of which either destroyed the western room then or in a later addition. Moreover, the axis is that of the early wing and not of the later, which was added on to it at an angle. No direct evidence as to its date was found.

Summary of dating evidence for period III. The large groups of pottery from the make-up of the stage, the floors of the orchestra and gangways, and from the surrounding road, belong consistently to the second half of the second century. The Samian ware is late Antonine, with the latest sherds dating between A.D. 180 and 200. Castor ware appears for the first time, and a very few sherds of imitation Samian, chiefly of mortarium forms. The coins are mostly earlier than the pottery. They are coins of Titus under Vespasian, A.D. 77-9, Domitian, Hadrian, Antoninus Pius (A.D. 154-7), Faustina I (died 141), Faustina II (died 175) (worn). The latest coin is too corroded to be clearly identified, but it probably belongs to Septimius Severus. The evidence therefore points to a date early in the third century for period III.

Period III a (pl. LXX)

As has been seen, the alterations of period III belong to the early third century. As to the length of time these buildings remained in use before falling into the decay which intervened between this period and period IV, we have no certain evidence. It does, however, appear that the north and south gangways were re-surfaced twice, for there were levels with fairly well-defined sandy surfaces, which were cut through by the foundation trench of the sleeper wall which was carried across the gangways when the orchestra wall was rebuilt. These levels tail out on the period III floor of the orchestra, where the level was not raised to correspond. The only coin from these levels was a worn *sestertius* of Marcus Aurelius, A.D. 164 (M. & S. 870), but the pottery was of early third-century date. The Samian forms were late examples of 45, 37, 31, and 33, and a number of imitation forms. A certain amount of Castor ware was found.

The only structural alteration traced was the rebuilding of the external staircases. At some period after the laying down of the surface outside the theatre corresponding to period III, the buttresses on either side of the two staircase piers were extended to a length of 7 ft. from the back wall. This extension stops just short of the surrounding line of posts. Possibly the staircase was now supported partly on stone instead of wood. The building level of this extension overlay the period III surface, and a wedge of yellow sand

running down on to this surface opposite the south gangway suggests the tail of a ramp or earth basis of a staircase. No evidence was found dating this addition.

Period IV (pl. LXXI)

In the course of the third century the theatre seems to have been so completely ruined as to need almost complete rebuilding. Part of the rebuilding was on a slightly different plan, and those walls which were re-used seem to have required rebuilding almost from the then floor level. The new work is easily distinguishable from the old, due to the use of a yellower mortar, larger flints, and generally rougher, though solid, workmanship. The chief alteration to the old plan was the extension of the *cavea* both at the top and bottom, at the top by the addition of a new outer wall, and at the bottom by bringing a portion of the orchestra wall forward at the expense of the orchestra area. The plan of the stage buildings remained the same, but the wings were rebuilt on slightly different lines. New floor levels were added everywhere, and from these came a vast quantity of dating material, including a great number of coins of the second half of the third century. The latest were those of Carausius, A.D. 287-93.

Outer wall. The new outer wall was of very substantial build, 6 ft. in thickness, with foundations going down to a depth of 6 ft. below the floor belonging to it. The lower 3 ft. of this was composed of alternate courses of chalk and flints, while there was a foot of packed clay and gravel below that. These chalk foundations seem to be typical of any of the walls of this period which go down to a considerable depth. Between the new outer wall and the old one was a space of 6 ft. 9 in., which was converted into a corridor, over which the seating would presumably have been carried on a barrel vault. The buttresses against the original wall, and the supports of the external staircases, were cut down to below the level of the floor of this corridor. The original level outside the theatre followed the natural slope of the ground down to the east, but the floor of the corridor was level. It was therefore very little above the earlier levels opposite the west entrance, while its make-up became increasingly thick towards the north and south gangways. Immediately east of these gangways there seem to have been wooden steps leading up to this raised level. This is suggested by the fact that the make-up of the corridor ends on an abrupt line, and its place is taken by a mass of burnt material, with alternating streaks of burnt wood and burnt soil. In this burnt material were found late fourth-century coins, while in the corresponding height of the corridor make-up, nothing was found of later date than the end of the third century. The outer wall here was destroyed down to its chalk foundations, so the

suggestion of the steps cannot be confirmed by the stepping down of the facing of the wall.

At the eastern ends the new wall was built against the wings, which at their western ends followed the lines of the period III wings. It is possible that originally the period IV outer wall ended against the westernmost room of the wing. As found, it crossed the wall of that room, which was removed outside the line of the wall, and ended against the next wall to the east, but the section between the two walls was of different build, without the chalk foundations found elsewhere. This extension, if such it was, of the outer wall could not be dated. In the filling over that portion of the wing which was abolished at the time of the extension was found a complete mortarium (fig. 10, no. 11).

In the make-up of the corridor were found coins of Severus Alexander (Cohen 380), Gallienus (M. & S. 181), and Carausius (type illegible), and a considerable quantity of pottery. Much of this was Antonine and earlier, and was obviously imported soil to level up the area. Besides this, there was a considerable amount of Castor ware, including thumb-pots, and some black glazed Rhenish ware.

Cavea. The lower part of the *cavea* was extended by rebuilding the orchestra wall on a flatter curve between the two lateral gangways. By this means, 7 ft. 6 in. was added to the *cavea* immediately adjoining the west gangway, tapering off to nothing at the side gangways. The new wall was carried across all the gangways by sleeper walls, ending at the east sides of the north and south gangways against the original orchestra wall. In the case of these two gangways, a large wooden sill, 1 ft. 4 in. square, rested on the sleeper walls. At the west gangway, heavy jambs were added to prolong the gangway walls, breaking through the earlier levels. Fragments of freestone from the original building were incorporated in them. The askew appearance of the extension of the gangway is due to an attempt to compromise between the axis of the orchestra and that of the gangway, which, as shown above (see p. 219), was set out wrongly in the first instance.

Between the new and old orchestra walls a wad of filling raised the level to that of the *cavea*. The old wall was found standing in parts to a height of 4 ft., but would not of course have been visible on the surface in the reconstructed building. In the wad the posts of the seating platform were left standing to a height of about 3 ft., while in the rest of the area they were cut down below the new floor. The coins from the wad were a rather worn *as* of Nero (M. & S. 329), two *asses* of Antoninus Pius, A.D. 154-5 (M. & S. 934), in good condition, an *as* of Faustina I (died A.D. 141) (M. & S. (Antoninus Pius) 1154) in fairly good condition, a rather worn *sestertius* of Marcus Aurelius, A.D. 171-2 (M. & S. 1033), and a *denarius* of Crispina, A.D. 177-83 (M. & S.

(Commodus) 278), in good condition. The pottery also was mainly Antonine, with some Castor ware.

Orchestra. The seating platform in the orchestra was abolished in period IV, and the whole area covered with a level floor, traces of the cement surface of which remained. In the centre, resting on this surface, was found a block of stone, 1 ft. 6 in. square, in the centre of which was the base of an iron pin, set in lead. The use of this is discussed later (see p. 247). Against the outer-front wall of the stage was a number of irregularly shaped pits, which were sealed by the floor of this period. They may be connected with the construction, or they may be for the purpose of drainage, which they certainly seem to serve, since they are sunk through an impermeable to a permeable stratum. There is also a suggestion of a drain along the stage wall, into the original period I drain. The make-up of the new orchestra floor contained a large number of coins. The list is as follows:

Trajan, *Dupondius*, very worn, type illegible.
 Trajan (103-14), *Dupondius*, worn, type illegible.
 Hadrian (132-4), *Sestertius*, worn, M. & S. 711.
 Antoninus Pius, *Sestertius*, worn, type illegible.
 Faustina I (died 141), *Dupondius*, worn, M. & S. (Antoninus Pius) 1161.
 Faustina I, *Sestertius*, worn, type illegible.
 Probably Severus Alexander, *Denarius*.

The following are all *Antoniniani* unless otherwise stated:

Victorinus (265-7). M. & S. 61, 78 (2).
 Gallienus (253-68). M. & S. 256 (minted 260-8).
 Claudius II (268-70). M. & S. 54, 81 (clipped).
 2 Claudius II consecratio (270). M. & S. 261-2 (clipped).
 2 barbarous Claudius II type.
 Tetricus I (270-3). M. & S. 56, 70 (clipped), 86/90 (2, one clipped), 88, 100 (2), 100/2, 126, 141, 148.
 Tetricus I, 3 coins not in M. & S.
 Tetricus II (270-3). M. & S. 248, 270-4 (clipped).
 Tetricus I or II. Barbarous, not in M. & S.
 Carausius (287-93). M. & S. 880.
 " " Irregular, not in M. & S.
 Diocletian (284-305). *Follis* (minted 296-305). Cohen 85 (1).
 2 illegible radiates.
 5 barbarous radiates.
 Barbarous radiate after 270.
 Radiate minim (cf. hoard).

The pottery included a considerable number of earlier fragments imported



Fig. 1. Curtain slot



Fig. 2. Stage after preservation work, with reconstructed column

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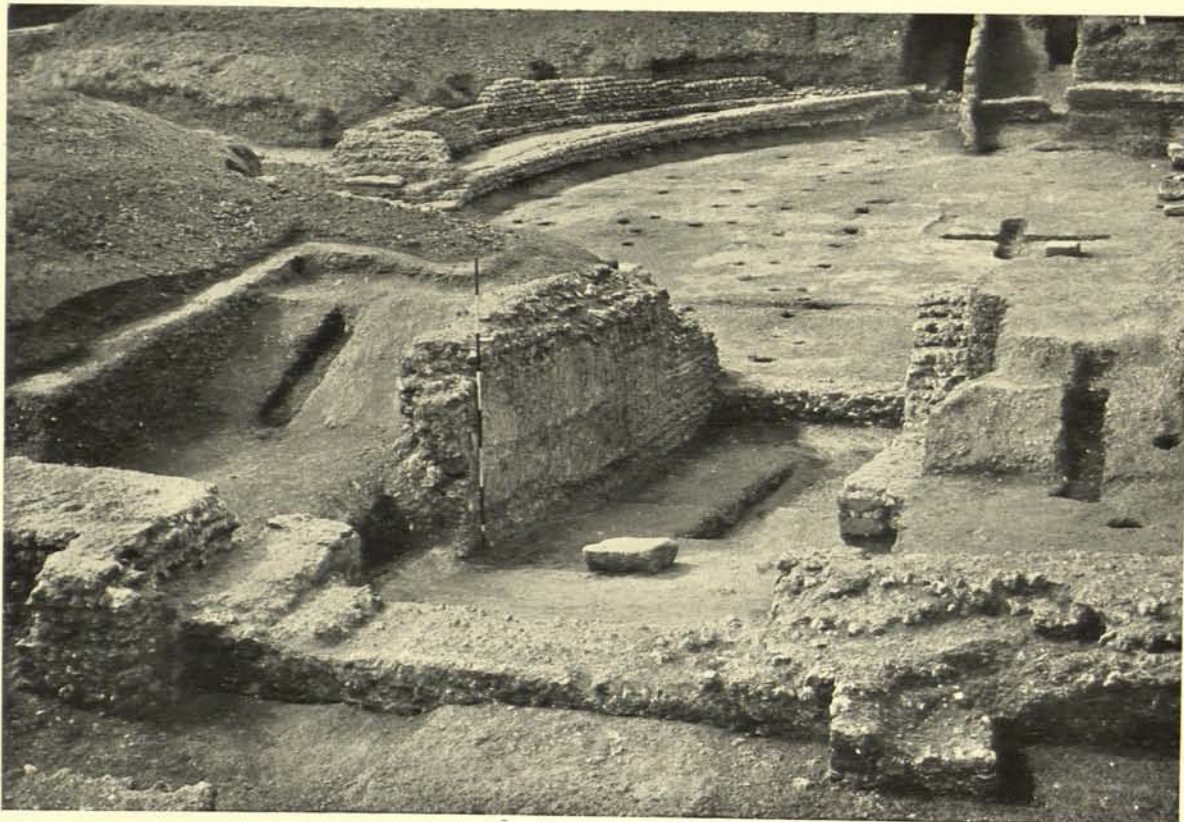


Fig. 1. South gangway, with lateral stairways of Period II

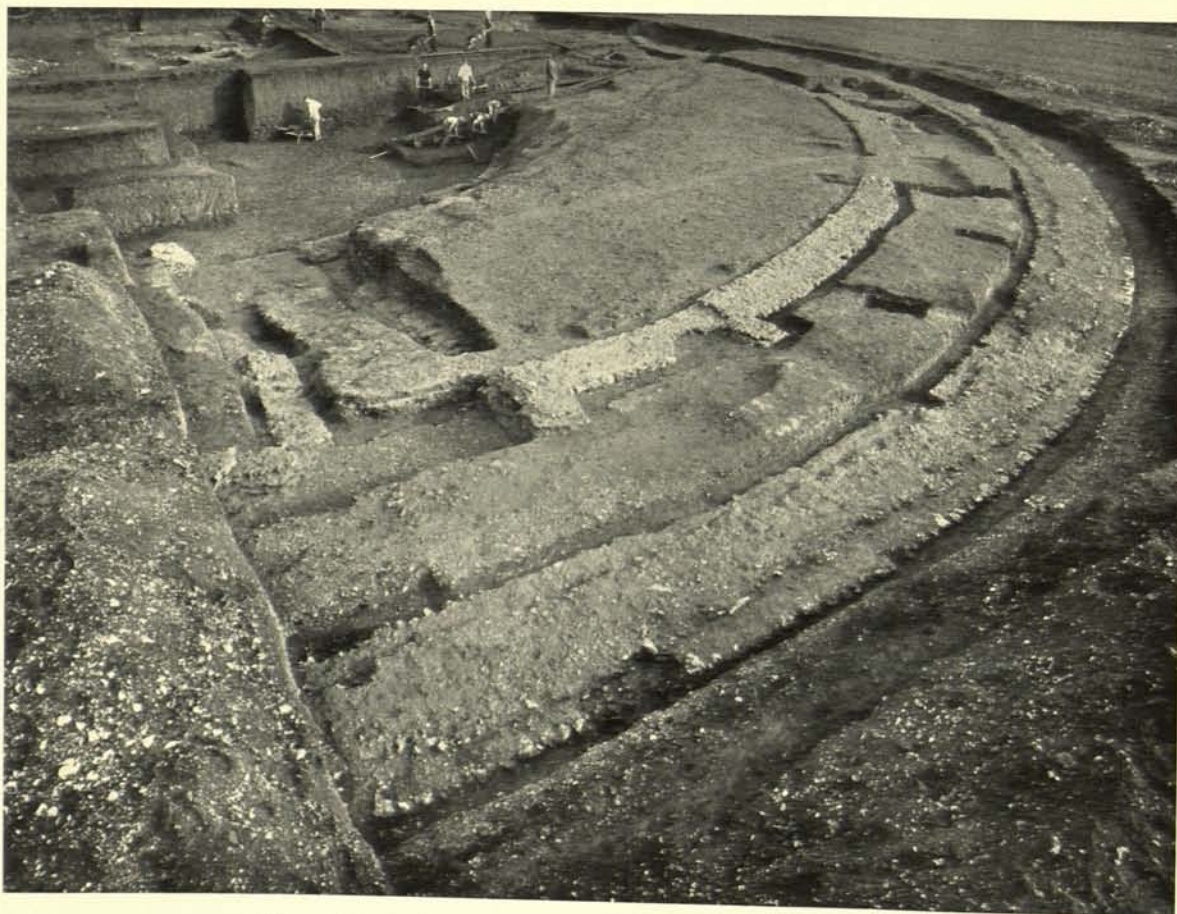


Fig. 2. Theatre partially excavated, showing depth of filling

with the levelling material, but there was a great quantity of third-century ware. This included a number of imitation Samian vessels, mainly of flanged forms, and a quantity of Castor ware. There was also a base of late Rhenish ware, and a late mortarium with drooping rim.

Gangways. The floors of all the gangways were raised in period IV, and the levels are clearly identifiable by being the only ones to cross the sleeper walls which carried the line of the rebuilt orchestra wall across the bottom of the gangways. This gradual raising of the gangway floor which had gone on in all the periods had involved the corresponding raising of the level of the staircases off the south gangway (and presumably those off the north gangway too). By period IV this level was above the existing remains of the wall, so that no trace of the staircases of that period remained, but they almost certainly did exist. The raising of the floor level would also have involved the rebuilding of the vaults over the gangways, since not enough head-room would have remained, the difference in floor level between the floors of periods I and IV being 5 ft. On the other hand, it is possible that the gangways were left unvaulted, as in the amphitheatre at Caerleon,¹ where the gangway floors were similarly raised. No voussoirs belonging to this or any other period were found, but this is not surprising in view of the thoroughness with which all bricks and stone, both freestone and flints, belonging to the superstructure were removed.

From the make-up of the floors came the following coins, all *Antoniniani*:

Gordian III (c. 242). Type illegible, very worn.

Valerian II (257-8). M. & S. 8.

Probably Claudius II. Type illegible.

Tetricus II (268-73). M. & S. 270 or 272.

Barbarous radiate.

The pottery resembled that from the orchestra, with Castor ware and imitation Samian forms, as well as surviving sherds of earlier forms. It included a mortarium of late third-century type with a hammer-headed rim.

Stage. The stage was rebuilt on exactly the same lines as that of period II, and the columns continued in use. In particular, it should be observed that both the front walls were largely rebuilt, though the inner one had been so thoroughly destroyed that the north end of the new wall had to be built on rubbish. This indicates that the double wall had a definite function, even though the posts can never have been used with it (see pp. 225-6). In the rebuilding, the out-curved south end of the outer wall was abolished, and both that gap and that at the north end were filled up. In the north end of the

¹ *Archaeologia*, lxxviii, 123.

inner wall, where alone it was standing as high as the floor level, were three equally spaced sockets, 9 in. square, but there is nothing to show whether they held a balustrade, or posts to which floor boards were secured. Apart from these, there is no evidence for a wooden floor at this period. As found, the surface was of cement about 2 in. thick, resting on an earth filling. The big sinkage which had occurred in the period III make-up over the hole in the front of the stage was levelled up, but this levelling in its turn sank slightly.

In this levelling, approximately in the middle of the stage, and 2 ft. behind the inner front wall, was found a hoard of about 800 radiate coins, including 616 minims ranging from 5 to 8 mm. in diameter. They were at a depth of 9 in. below the surface, in a place where the cement floor was particularly well defined and intact, and there was no possibility that the hoard was inserted after the floor was laid down. It cannot, however, be definitely said whether the soft earth in which they lay was put down to fill up the sinkage immediately prior to the laying down of the floor, or whether it was accumulation there while the theatre was lying derelict. It looks more like the former, since the earth is found only in the sinkage, and elsewhere the make-up of the floor rests immediately on the earlier floor. It is therefore not certain whether the hoard was buried or lost during the actual reconstruction of the theatre, or slightly earlier, but it is quite certain that it was prior to the completion of the reconstruction. The whole group lay together in a very small area, most of the coins being corroded into a single mass, and they had obviously been in a purse or other container. Of this, the only trace was a very slight dark stain in the earth. The importance of this hoard will be discussed elsewhere¹ by Mrs. R. E. M. Wheeler, and it is only necessary here to stress the find-spot and associations.

Besides the hoard, 169 coins were found in the period IV make-up of the stage, the vast majority of the second half of the third century, the latest being two of Carausius (A.D. 287-93). Of these, 144 coins occurred in an area so restricted as to suggest that they had formed a second hoard, and are here listed separately. Thus grouped under two headings, the 169 coins were as follows:

(a) 144 coins, *probably a hoard*.

1 Marcus Aurelius (161-80); illegible *as*.

1 Philip I (244-9). Cohen 82.

1 Trajan Decius (249-51). Cohen 49.

9 Gallienus (Sole Reign). M. & S. 179, 193 var $\left(\frac{1}{s} + 1\right)$, ? 253, 275, 283 $\left(\frac{1}{A}\right)$, 287 $\left(\frac{1}{\epsilon} + 1\right)$, and one barbarous.

¹ In a forthcoming volume of the *Numismatic Chronicle*.

- 5 Claudius II. M. & S. 19, 48, 261/2 [2], 266.
 1 Aurelian. Not in M. & S. (*Obv.* IMP AVRELIANVS AVG. Bust radiate and cuirassed r. *Rev.* LIBERT AVG. Liberty stg. l. with cap of Liberty and transverse sceptre).
 1 Postumus. M. & S. 75.
 6 Victorinus. M. & S. 59, 78, 114 ($\frac{*}{|}$ —[2]), 118 ($\frac{v}{|}$ *) and one barbarous.
 28 Tetricus I. M. & S. 56, 68-71, 77, 80, 87, 88[3], 90, 86-9, 86-90[2], 95, 100[4], 128, 136, one *Laetitia* type, ? one *Pax* type, four with reverses illegible and three barbarous [two *Spes* type].
 11 Tetricus II. M. & S. 232, 248, 254-8, 259, 258-9, 265, 270, 272, one with reverse illegible and two barbarous (one *Pietas* type).
 2 Carausius. M. & S. 300 ($\frac{s}{c} \frac{p}{|}$), one barbarous (? Carausius).
 20 Radiate Crowns including 1 *Pax* type, 3 ? *Pax* type, 1 ? *Laetitia* type, 1 ? *Sol* type.
 43 Barbarous Radiate Crowns including 1 *Invictus* type, 1 *Laetitia* type, 1 *Pax* type, 1 ? *Pietas* type, 1 ? *Spes* type, 1 ? *Victoria* type.
 5 Radiate *Minimi*.
 10 Illegible, probably all third century prior to Carausius.

144

(b) 25 coins found elsewhere in the make-up of the stage.

- 1 Domitian (81-96); *denarius*. M. & S. 110.
 1 Antoninus Pius (138-61); *sestertius*, not in M. & S. *Obv.* ANTONINVS AVG PIVS P P TRP COSSIII. Head, laureate r. *Rev.* III ARTAS S C. Female figure standing l. right arm extended holding ? This may be an irregular Hilaritas.
 1 Faustina I (died 141); illegible *as*.
 1 Caracalla (198-217); *denarius*, not in Cohen. *Obv.* ANTONINVS PIVS AVG. Bust laureate, r. *Rev.* CONCORDIA. Concordia standing l., at altar holding patera and cornucopiae.
 1 Gordian III (238-44); probably Cohen 296.
 1 Trebonianus Gallus (251-3). Cohen 126.
 1 Gallienus (253-68). M. & S. 597.
 3 Victorinus (265-7). M. & S. 71 (2), 78.
 4 Claudius II Gothicus (268-70). M. & S. 49, 86, 109, 261/2.
 2 Tetricus I (270-3). M. & S. 76/7, 118.
 1 Tetricus II (270-3). M. & S. 260.
 8 Barbarous Radiates.

25

The pottery included a number of survivals from earlier levels, such as a form 31 with the stamp *ETERNALIS FECIT* (Antonine period), and a 33, stamped *CINNAM* (late second century), and forms 32, 45, Curle 21 (late), a dish-shaped 31,

all probably dating from the end of the second and the beginning of the third centuries. Besides this there was a considerable quantity of imitation Samian and Castor ware with high pedestal bases of a late type.

Wings. The south-east wing was rebuilt on slightly different lines. The principal room was now oblong instead of square, with a portico or verandah, deeper on the south than on the east, on the two external sides. The wall of the one on the east was based partly on the outer wall of the original wing. The principal room was floored with a red brick tessellated pavement. As shown above (p. 233), the westernmost room of the period III wing may have been abolished now, or possibly not till later. The history of the north-east wing can only be presumed to be the same as the south-east one, since subsidence had completely destroyed it.

Triumphal Arch. Immediately adjacent to the south-east wing, in fact awkwardly close to its corner, was found a portion of what must be a triumphal arch spanning Watling Street. From both style of building and level this belongs to period IV (late third century). The part found suggests a pier on the plan of those of the Arch of Constantine at Rome, which is of about the same date, with a projecting podium at either end, on which would have stood a column. The whole of this block on the line of the projecting podia had a brick course immediately above the level found, while the two external (western) angles seem to have been turned in brick. The internal (eastern) angles of the presumed base of the pier, which should have projected an equal distance on either side of the podia, do not seem to have been of brick, and there is nothing to distinguish the edge of the pier from its continuation beneath the road as a sleeper wall, though this portion of the foundations is standing to a higher level than the western edge. Architecturally, however, its reconstruction as a pier 13 ft. wide is much the most probable, for a pier of the width of the brick-built portion (5 ft.) would be very narrow, even with columns or buttresses supporting it at the brick-built corners of the four-foot projection. The sleeper disappears under the edge of the present road, but deep robber trenches give the approximate position of the far side. There seems to have been room for a single roadway only. This arch superseded the arcade belonging to the first period, the robber trench of one of whose piers is found beneath it. Lying close to the arch was a fragment of carved cornice (pl. LXIV, fig. 1).

Summary of dating evidence for period IV. Period IV, therefore, was one of an elaborate reconstruction, in somewhat more slipshod style than the original building. The scheme, with its extension of the seating accommodation and its triumphal arch, was clearly a grandiose one, and was necessitated by the very complete destruction of the earlier building. Sealed by the floors of this period were, in addition to the hoard of minims, 229 coins, of which 206



Fig. 1. Fragment of cornice from Period IV Triumphal Arch



Fig. 2. Iron counterpoise, probably from curtain-raising apparatus

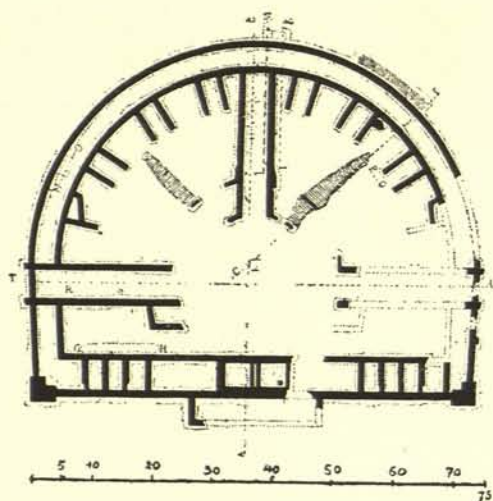


Fig. 1. Évreux

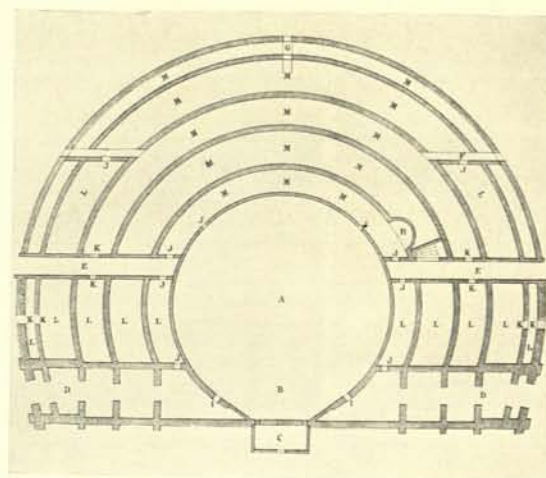


Fig. 2. Herbord

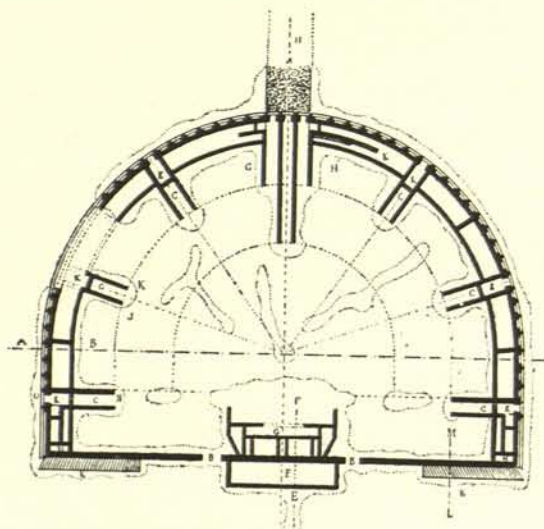


Fig. 3. Vieil-Évreux

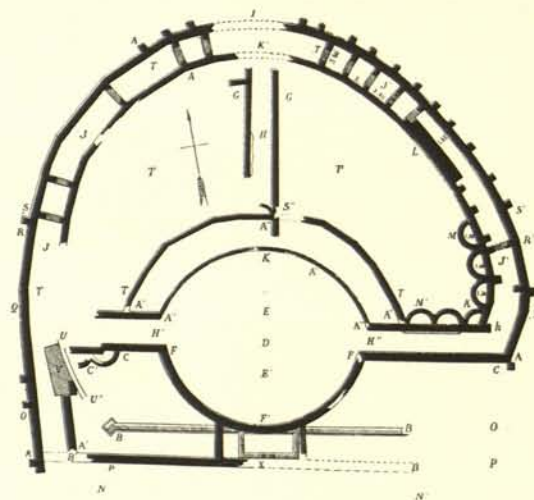


Fig. 4. Vieux

are of the radiate type of the second half of the third century. The latest coin is the solitary *folles* of Diocletian, minted between 296 and 305 and lost when still practically in mint condition. With this late third-century dating the abundant pottery agrees. On all grounds, it is clear that the rebuilding took place within a very few years of A.D. 300, prior to the arrival of Constantinian coins in Britain.

Period IV a

The only structural alterations traceable after period IV affect the south-east wing. Here the portico on the east side was abolished, and a level of yellow gravel laid over it. This was possibly owing to the cramped appearance that must have been given to the triumphal arch by a colonnade running up to the line of the projecting podium, and only a foot to the west of it. The wall of the room was at the same time carried across the southern portico, and the butt-joint at the south-east angle of the room is very clear. From the laid gravel overlying the portico wall came a coin of Constantius II or Constans (A.D. 345-61), which would therefore show that the theatre remained in use to that time.

Decay of the theatre

The alterations to the south-east wing are the last indication we have of the use of the theatre. Soon after this the area seems to have been given up to use as a rubbish dump. To a depth of about 5 ft. the orchestra was found filled with rich organic earth, which must have come largely from the decay of vegetable refuse. In places there was a number of broken bricks and tiles, but on the whole there was not much suggesting the clearing up of destroyed buildings. The only place where there were many tiles was immediately in front of the stage, and they may have come from the collapse of its roof. The stratification was very regular. The bottom layer was slightly browner in colour than the top, and sloped down from the edges towards the centre, from a thickness of 4 ft. at the foot of the gangways, which it overlay, to about a foot in the centre. Above this was a layer of rich black earth, which overlay the stage, tailed off against the brown earth up the gangways, and attained a thickness of about 4 ft. in the centre of the orchestra. It was plain that this filling was put into the orchestra before the walls were robbed, for their robber trenches showed up very clearly in it. The filling produced a very large number of fourth-century coins down to Honorius and Arcadius, which are here summarized.

THE ROMAN THEATRE AT

(i) *From the lower brownish deposit.*

Third century and earlier	.	.	.	.	.	.	225
Fourth century: House of Constantine	.	.	.	.	.	.	658
" " House of Valentinian	.	.	.	.	.	.	69
" " House of Theodosius	.	.	.	.	.	.	5
" " Unidentified	.	.	.	.	.	.	10
Total							<u>967</u>

(ii) *From the upper black deposit.*

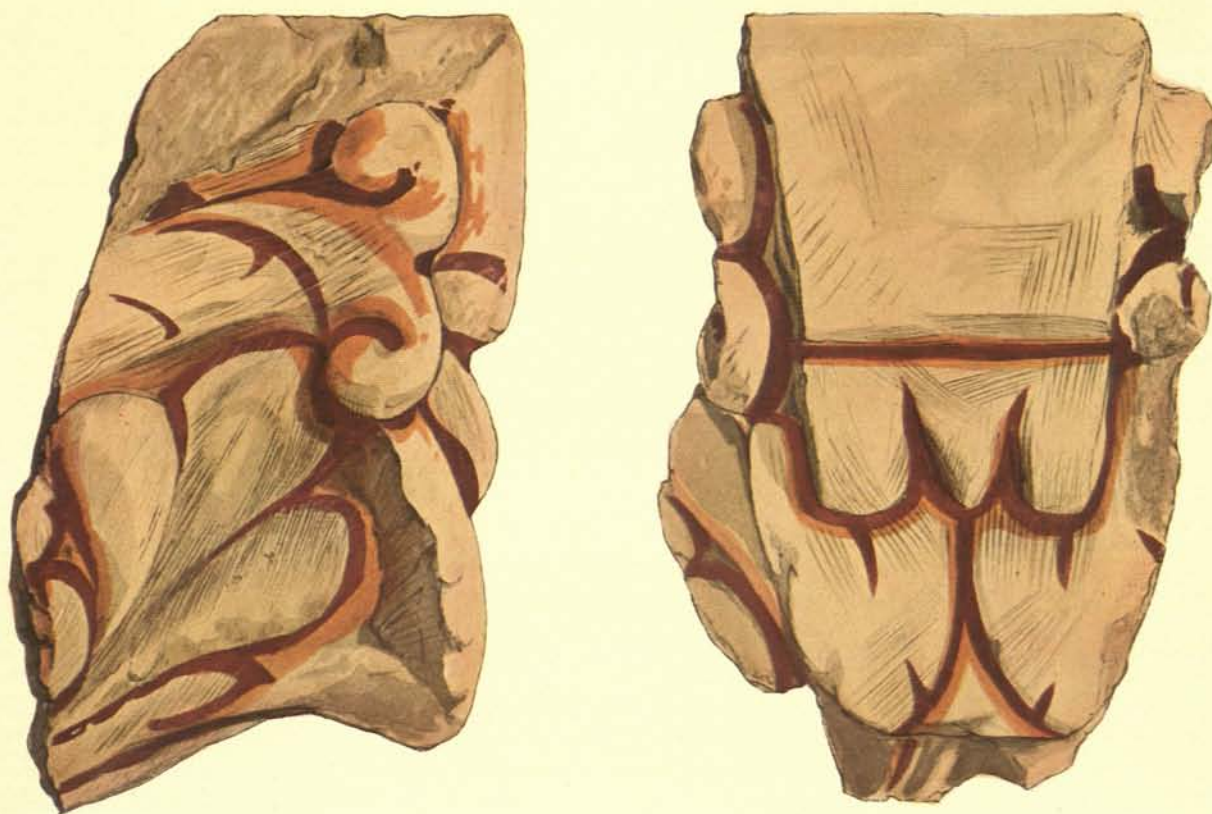
Third century and earlier	.	.	.	.	.	.	302
Fourth century: House of Constantine	.	.	.	.	.	.	787
" " House of Valentinian	.	.	.	.	.	.	120
" " House of Theodosius	.	.	.	.	.	.	21
" " Unidentified	.	.	.	.	.	.	90
Total							<u>1,320</u>

(iii) *From the surface soil above the theatre.*

Third century and earlier	.	.	.	.	.	.	616
Fourth century: House of Constantine	.	.	.	.	.	.	568
" " House of Valentinian	.	.	.	.	.	.	117
" " House of Theodosius	.	.	.	.	.	.	12
<i>Minimi</i> of Lydney type C (average diameter 7.5 mm.), 9; of type							
F (average diameter 3.5 mm., 1	.	.	.	.	.	.	10
Fourth century: Unidentified	.	.	.	.	.	.	102
Total							<u>1,425</u>

The pottery from the filling was entirely homogeneous, and shows hardly any survivals from earlier periods. The distinctive types are imitation Samian forms, late Castor ware, considerably later in character than that in period IV, white ware with red paint, vesiculated ware, and late mortaria. There seems to be some difference in the pottery from the brown earth and the black earth. The former has only one form of mortarium (fig. 11, no. 29), while the black earth has that and another one as well. The black earth also has a number of bowls in vesiculated ware which do not occur in brown earth.

The filling is almost certainly household rubbish, for it contains much broken pottery and animal bones, chiefly sheep and ox, while the dark earth must come from decayed organic matter. If it had been the cleaning up of a derelict area, one would have expected far more building rubbish than was actually found. There is no evidence whether the accumulation is due to gradual individual dumping over a considerable period, or whether the filling is all contemporary and due to some municipal clearing of a rubbish pit from some other spot. The difference in colour between the lower stratum



Scale 1 0 1 2 3 4 5 *Inches*

Painted fragment from Period I stage

and the upper may be from a difference in the rate of accumulation, in which more wash from the surrounding ramp mixed with the lower than with the upper layer. Alternatively it may indicate a different place of origin for the two layers.

But whatever the origin of this household rubbish, the presence of such a very great number of coins in it is most remarkable, and no adequate explanation for their presence has yet been advanced. If they represent hoards buried in earth subsequently transferred to the theatre, it is hard to believe that so many would have escaped the eyes of the men who transferred it. It is equally hard to believe that householders dumping their rubbish here would have been so careless with their money as to lose it in such great quantities.

It is also difficult to fix the date of the filling with certainty, and to say whether it was within the period of the official Roman Empire in Britain, or in the subsequent dark ages, since there is no evidence how long the fourth-century coins remained in use, as there was nothing to replace them. A significant fact, however, is that when the adjoining temple was rebuilt after A.D. 379, its entrance, which had been on the east side facing the theatre, was transferred to the west side, and the east entrance was walled up. This is consistent with the probability that the theatre was at least in ruins, if not already a rubbish pit, by that date.

In due course the walls of the theatre were removed by the Saxon and Norman builders, as were all the other walls of Verulamium. When that happened, the collapse of the earthen basis of the *cavea* would inevitably follow, and by a gradual process of erosion and ploughing its debris completed the filling up of the orchestra begun by the dumping of the rubbish, until the whole area was completely level, without any surface indication of the existence of the theatre.

Historical Summary

The first phase of the history of the theatre belongs to the period of prosperity at Verulamium between A.D. 130 and 150, in which the city area was greatly enlarged and its existing walls built. It was obviously part of a big town-planning scheme, in which public buildings worthy of the prosperity of the city were provided. As the only known Roman theatre in Britain, it emphasizes the importance of Verulamium and the extent to which it had absorbed Roman civilization.

The second period follows rapidly on the first, and dates soon after A.D. 160. For some reason a different kind of performance was desired, and the character of the theatre was considerably modified.

Period III belongs to the early years of the third century. It is very possible that it was part of the general revival of prosperity due to the restoration of order by Septimius Severus after the disorders of the end of the second century. It may be remarked that though we have not found traces of extensive building operations at this period, we know nothing of the state of the superstructure.

Period IV similarly coincides with the restoration of order by Constantius Chlorus in the last years of the third century, after the chaos under the unofficial emperors who preceded him. All the buildings in Verulamium that have been excavated so far show a similar rebuilding after extensive destruction. From the extent to which the walls had to be rebuilt, the theatre must have gone entirely out of use in the preceding times of trouble.

In the southern half of the city, the story after this revival seems to be one of uninterrupted though gradual decay. It seems probable, however, from the great number of fourth-century coins found not only in, but round, the theatre, that the fourth-century city shrank back to the area of the first-century one. Minor alterations were made to the theatre in the middle of the fourth century, indicating that it was still in use, and the adjoining temple was rebuilt not earlier than A.D. 379. The date of the final abandonment of the city has not yet been discovered, but the general course of events, with gradual decay and shrinkage, is clear, and there can be no more striking commentary on this than the use of the theatre, fronting on Watling Street, one of the principal roads of the country, as a rubbish pit.

2. COMPARISON OF THE VERULAMIUM THEATRE WITH OTHER EXAMPLES

The normal type of Roman theatre is well known, both from existing examples and from the detailed instructions for its construction given by Vitruvius. For purposes of comparison it is convenient to recall the main features of this type of theatre. In contrast with the Greek theatre, in which originally all the action took place in the circular orchestra, and where this area always remained important and free from seats, in the Roman theatre the essential feature was always the stage. This was large, to accommodate all the actors, and the back wall, or *scaenae frons*, was elaborately decorated with columns and sculpture. Moreover, the auditorium was arranged so that all the seats should have a good view of the stage. For this reason the *cavea* rarely exceeded the semicircle, for obviously any increase beyond that point both diminished the size of the stage and provided seats which must face more and more away from the stage and towards the orchestra. The *scaenae frons* was joined by projecting wings to the *cavea*, and the entrances to the orchestra

were by vaulted passages piercing that portion of the *cavea* nearest the stage. The orchestra was largely given up to seats for the senators and other notabilities, whose thrones or arm-chairs were placed on low broad steps.

These features of the Roman theatre are of course well known, but a portion which is more obscure is the curtain, which was a necessity in the Roman drama, and that is therefore discussed in more detail. Unlike the modern theatre, in the Roman theatre this was lowered to disclose the scene. The mechanism is not absolutely certain, but it seems to have been operated by a number of telescopic poles. In a large number of theatres found, there is a slot in the front of the stage, into which the curtain would obviously descend, in order not to block the stairs up to the stage. From this slot a number of holes, usually about eight, descends nine to twelve feet to a lower level, sometimes into a tunnel beneath. The suggested manner of operation¹ is that these contained hollow posts, with other posts inside them, possibly hollow in their turn. These would be operated by a rope attached to the lower part of the upper (inner) pole, running over a roller on the top of the lower pole. When this was tightened, the inner pole would be caused to ascend to the top of the outer one, with of course a stop to prevent it going too far. There may have been another joint inside that one. The whole would presumably be operated by a series of compound pulleys and counterpoises. A good example of the slot and post sockets is found at Arles. This explanation, though complicated, seems to be the only one that meets the facts.

The detailed instructions given by Vitruvius, and numerous existing examples, show what a stereotyped building a theatre was under the Roman Empire. Variations there certainly were, and probably no existing example exactly conforms with the dimensions and proportions laid down by Vitruvius. But the functions of the various parts were very definitely established, to suit the kind of performance given, and the variations are within very definite limits.

But when we turn to the Verulamium theatre it is clear that the differences between the first-period building and the Vitruvian theatre go far beyond the normal range of variations. The semicircular orchestra, the large stage, the entrances to the orchestra adjoining the stage are all lacking. The width of the stage is little more than half the diameter of the orchestra instead of twice that length, and its area is much diminished by fronting merely on to the curved orchestra wall. The seats are so arranged that a large number of them faces towards the orchestra, and partially away from the stage. This, it may be remarked, is more the case than in a Greek theatre, for there the continuation of the auditorium beyond the semicircle is broadened out from the

¹ Fiechter, *Die baugeschichtliche Entwicklung des antiken Theaters*, pp. 120-3.

true circle, either on straight lines, or a circle with a longer radius. Moreover, in the Greek theatre, the stage is set back from the end of the auditorium, instead of being clasped by it as at Verulamium. From every point of view it is clear that the part played by the stage in the original building at Verulamium is a minor one, and the real focus of attention was the orchestra. Also, the central back gangway occupied the place of the seats with the best view of the stage, which was never found in the Vitruvian theatre.

The slight resemblance to a Greek theatre is, it need hardly be said, entirely superficial, due to the fact that in both the orchestra was the important part, for no one would imagine that performances requiring a classical Greek chorus were given in second-century A.D. Roman Britain.

It is thus apparent that we have to deal with an anomalous type of theatre. The theatre at Verulamium, however, does not stand alone, for there is a number of obscure little theatres in the north of France, in the province of Gallia Comata, which clearly belong to the same class. The most striking analogy is that of the theatre of Vieux, near Caen, in Normandy (pl. LXV, fig. 4). The size of the theatre is almost identical with that of Verulamium, and we have the same circular orchestra, small stage with a curved front, and gangways in a similar position. It is probable too that the outer wall is an addition, as at Verulamium, for otherwise what were clearly originally buttresses against the inner wall would be meaningless. The section of the wall that is thickened from 90 cm. to 2 m. 20 cm. is obviously the support for an external staircase. A group of theatres in the same neighbourhood, Lillebonne (fig. 7), Valognes (fig. 8), Evreux, and Vieil-Evreux, show the same general characteristics, though with minor differences. There is a number of others of the same class elsewhere in North France, though nowhere as many as in Normandy, which are shown on the map (fig. 2).¹ At Drevant, in the province of Cher, there is a most important one (fig. 6), of the same main type, with the addition of a feature not found in those mentioned above. This is the provision of what must be dens for wild animals beneath the podium of the *cavea*. Apart from this there are many points of resemblance to the Verulamium theatre. An interesting point is that the outer wall is really a stylobate carrying a number of piers, to which possibly the wooden posts surrounding the wall of the *cavea* at Verulamium may correspond. The excavator suggests that the walls running out from the front of what may be the stage or the postscenium may have supported a wooden stage, but that is not definite. As at Verulamium, and at all the others where the dimensions are given, the wall dividing the *cavea* from the orchestra is high, in this case 2.78 m.

The example at Drevant gives a further connexion with the structure

¹ For further details about these theatres see list, with bibliography, pp. 247-52.

known as *Les Arènes* at Paris. This is much more in the oval shape usually associated with amphitheatres than the examples that have so far been con-

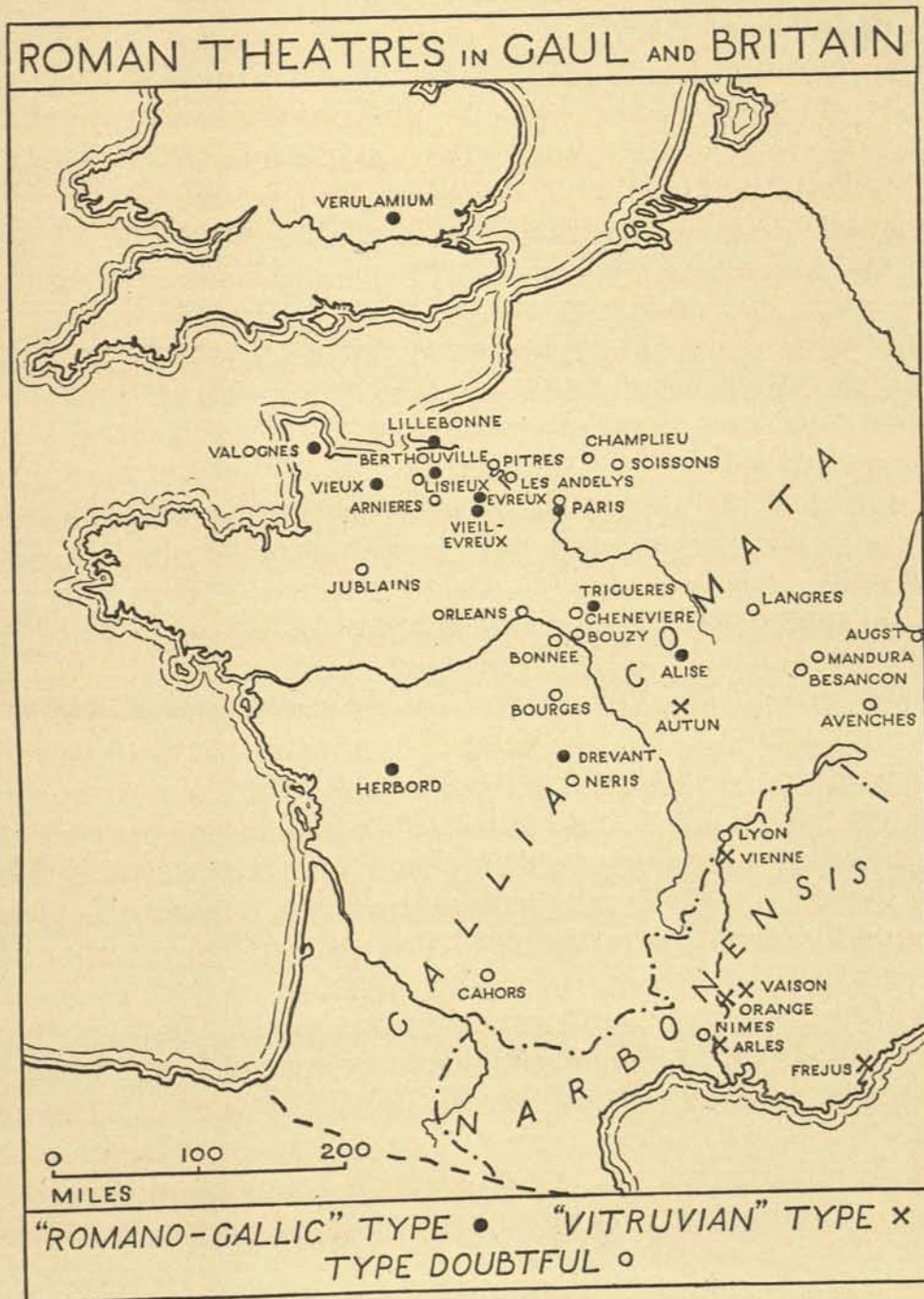


Fig. 2. Distribution map.

sidered, but it had a very similar arrangement of a stage at one side. The dens also resemble those of Drevant. What is called the theatre at Paris has been so little excavated that it is impossible to say whether it is of the normal type

or not. It has, however, the feature of a central gangway at the back, which is not found in any normal classical theatre.

It is unfortunate that none of these theatres should have been dated. In some cases the reign of Hadrian or the Antonine period has been suggested, but no evidence to that effect has been produced.

As to the use of this type of theatre there is no direct evidence. Roman drama was very decadent by this time. Not infrequently theatres on the classical plan were used for fights and beast shows,¹ and there is a number of examples of barriers being erected to protect the spectators in these cases.² Our type of theatre, however, cannot have been erected simply as an amphitheatre, since it is too small for anything on the grand scale in which the Romans delighted. It would appear, however, from the example of Drevant, that beast fights represented at any rate one of its uses. The stage, too, must have had some function, though it was too small for the normal Roman pantomime or play. Some kind of games or dances may have taken place round the central upright which apparently existed at Verulamium, or possibly this was a post to which baited animals could be attached. It is also highly probable that they would be used for cock-fighting, for which the ordinary amphitheatre would be inconveniently large. For want of a better, the name 'cock-pit theatre' may be suggested as describing this class.

The distribution (fig. 2) of these theatres is interesting. It is definitely localized in Gallia Comata and Britain. The theatres in the south of Gaul are on the normal 'Vitruvian' plan. There is a number of theatres in Gaul which have not yet been sufficiently excavated to identify their type, but though further investigation may show that the distinction is not quite so clear cut, it is not likely materially to alter the general balance. It is worth comparing the distribution of the type of theatre with that of the Romano-Celtic temples.³ It is quite clear that they are both a native variation, unknown in the intensively Romanized Mediterranean countries, with which South Gaul may be included; and in the same way that the temple does not appear in the military frontier zones, the theatre seems to occur in towns in which there was a strong native element.

The alterations carried out in period II at Verulamium clearly modified the function of the building. A large part of the orchestra was given up to a platform which almost certainly held seats, probably seats resembling those of the notabilities elsewhere, with low steps on which were placed arm-chairs

¹ The Ancyrean inscription records that during the reign of Augustus the theatre of Pompey was used for fights between wild beasts and gladiators, in which no less than 500 lions and 20 elephants were slaughtered (*Monumentum Ancyrum*, published by Mommsen, 1883).

² e.g. Ephesus and Termessus. Fiechter, *Die baugeschichtliche Entwicklung des antiken Theaters*.

³ *Antiquaries Journal*, viii, 300-26.

or thrones. A further portion of the orchestra was cut off by the building of a straight front wall to the stage, while the construction of piers to support columns occupied part of the back of the stage. The whole scheme is obviously to convert the theatre into one on the classical model as far as possible. The stage was enlarged as far as was practicable, and its back decorated in imitation of the normal *scaenae frons*, while the orchestra was largely given up to seating. Not sufficient room remained for much action to have taken place in the orchestra, and it was probably all confined to the stage, as in the performances in the 'Vitruvian' type of theatre. There was almost certainly a curtain between the stage and orchestra, originally operated by the type of mechanism found in the 'Vitruvian' theatre. This seems, however, to have proved unsatisfactory, possibly owing to the damp, and the holes for the posts were abandoned. The slot for the curtain seems to have been retained, so possibly some other mechanism was adopted.

In period III the type of theatre remained the same, but period IV seems to show a reversion to the original type. The seating of the orchestra was abandoned, and the area once more given a level surface. The stage was retained, but in the middle of the orchestra was found a stone with an iron pin set in lead in its centre. It seems possible that this served the same purpose as the cross-pieces and upright of period II. It is not likely to have been an altar, since one in such a position never played a part in the Roman drama.

Conclusion

The theatre at Verulamium from every reason may be considered important. It is the only Roman theatre in Britain so far discovered. It is of a distinctive and interesting type, and the history of its changes is in some degree an index of the culture of the inhabitants of the city. Its history closely follows that of the city and of the province in their periods of prosperity and decline. In fact, its story is an epitome of the intellectual and material condition of the population of one of the greater cities of Roman Britain through more than two-and-a-half centuries. It is clear that the re-excavation of the theatre has been more than justified.

3. BIBLIOGRAPHICAL LIST OF ROMAN THEATRES IN FRANCE, GERMANY, AND SWITZERLAND

A. Theatres of the Romano-Gallic Type

Alesia (fig. 3). Orchestra considerably more than semicircle. Stage buildings project backwards from façade, with a portico surrounding them. Exterior staircase to *cavea*.

E. Espérandieu, *Les fouilles d'Alésia de 1906*.

Les Andelys (Noyers-sur-Andelys) (Eure). Excavated 1927. Orchestra wall not found, but conformation of the ground makes it certain that it formed considerably more than a semicircle. The walls of the façade form an angle of 55° at each corner with the base line of the exterior wall, thus resembling period I a at Verulamium. The stage buildings were not found. Apparently a gangway in the centre, opposite the stage. No evidence as to date.

L. Coutil, *Les Ruines romaines de Noyers-sur-Andelys (Eure)*, 1928.

Araines près Vendôme (Loir-et-Cher). Orchestra much more than semicircle. Stage not found, but certainly of 'cock-pit' type. Reference to publication not traced, but plan in possession of M. L. Coutil.

Arnières (Eure). Excavated c. 1840. Interior not cleared, but external plan similar to that of Évreux and Vieil-Évreux, and considerably more than a semicircle. Therefore probably of 'cock-pit' type.

J. Bonnin, *Antiquités gallo-romaines des Éburovices*, Section IV, Arnières, pls. II and III.

Augst (Switzerland). Three periods of building, scanty remains of first period (Augustan), show orchestra of more than semicircle, and central back gangway. It is therefore probably of the 'cock-pit' type. In the second period (c. A.D. 73) it was apparently converted into a true amphitheatre with oval arena, though no seats are shown on one side. In the third period (second century A.D.) it approaches the classical type, with semicircular orchestra, though the central back gangway was retained.

F. Stähelin, *Die Schweiz in römischer Zeit*, pp. 438 and 554-6.

Avenches (Switzerland) (fig. 4). Orchestra would appear to be more than semicircular, the semicircle being continued in straight lines to the back wall. A dotted rectangle projecting into this area in the plan may be hypothetical, but if it is not, it may resemble that of Hedernheim (*q.v.*). Radial gangways descend into what is probably the area of the orchestra seats, separated from the actual orchestra. Stage building projects back from façade. On whole, mainly of cock-pit type. Original date not known, but rebuilt c. 300 A.D.

F. Stähelin, *Die Schweiz in römischer Zeit*, pp. 437 and 564; E. Secretan, *Aventicum, son passé et ses ruines*, 1919, pp. 72-80.

Berthouville (Eure) (fig. 5). Excavated 1896 by R. P. de la Croix. Orchestra more than semicircle, and stage very small, but it is not quite clear if the seating continued beyond the gangways on the transverse diameter. The plan is closer to the 'cock-pit' than Vitruvian type.

L. Coutil, *Les Ruines romaines de Noyers-sur-Andelys*.

Bonnée (Loiret). Plan incomplete. Outer wall in shape of a circle truncated considerably beyond the diameter, so probably of the 'cock-pit' type.

M. Jollois, *Mémoires sur les antiquités du département du Loiret*, 1836, pp. 55-61.

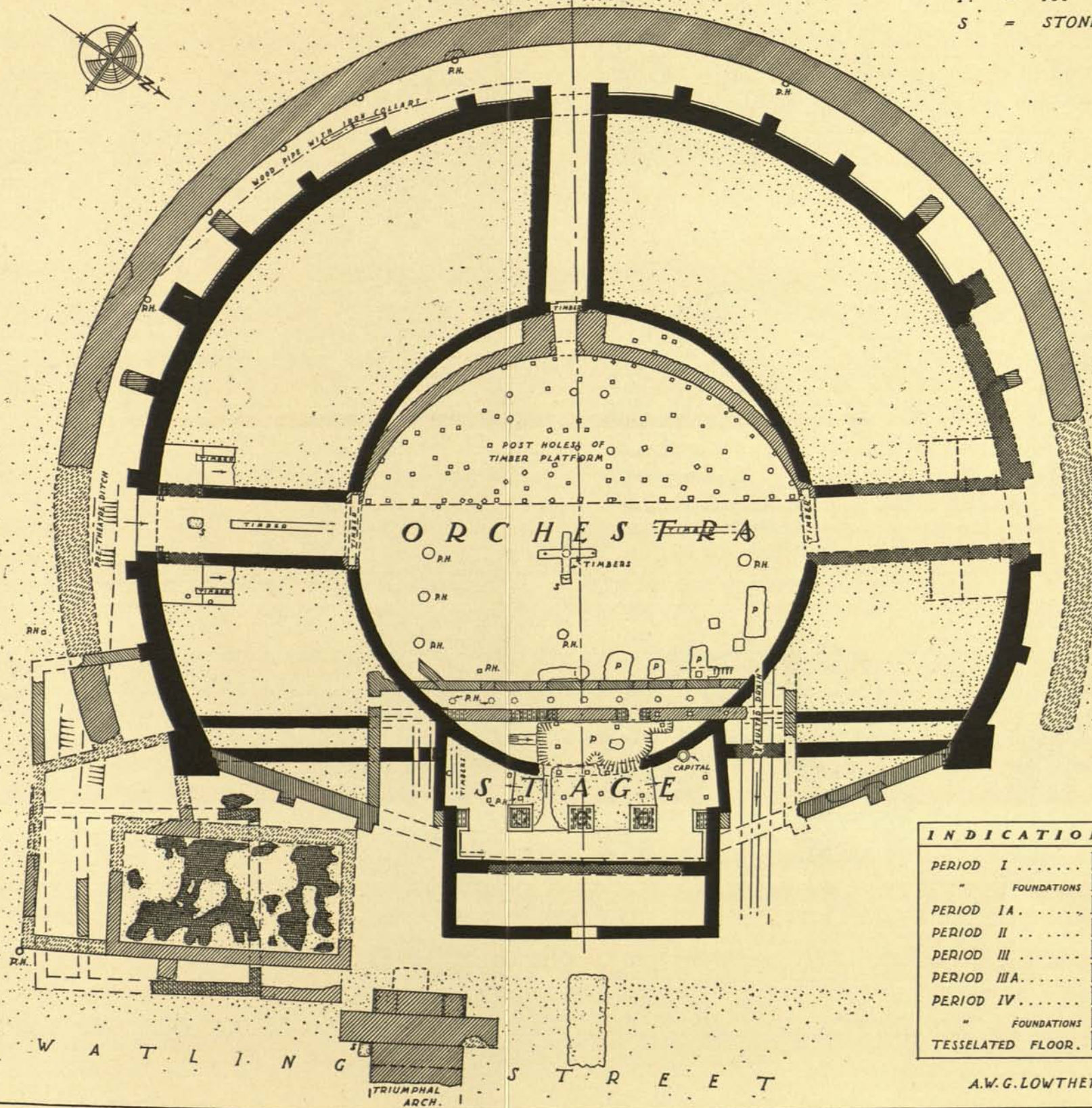
Drevant (Cher) (fig. 6). Excavated in 1834 and 1901-5. Orchestra circular, with wall standing 2.78 m. high, traces of balustrade on top of that. Three dens for animals in this wall. Gangway to orchestra only, along sides of stage, and radial ones to *cavea*. Building resembling the stage at Verulamium clasps the orchestra wall, but traces of

V E R U L A M I U M

THE THEATRE.

SCALE OF 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 FEET.

P.H. = POST-HOLE
P. = PIT
S = STONE



INDICATIONS.	
PERIOD I	
" FOUNDATIONS	
PERIOD IA	
PERIOD II	
PERIOD III	
PERIOD IIIA	
PERIOD IV	
" FOUNDATIONS	
TESSELATED FLOOR.	

A.W.G. LOWTHER, F.S.A.

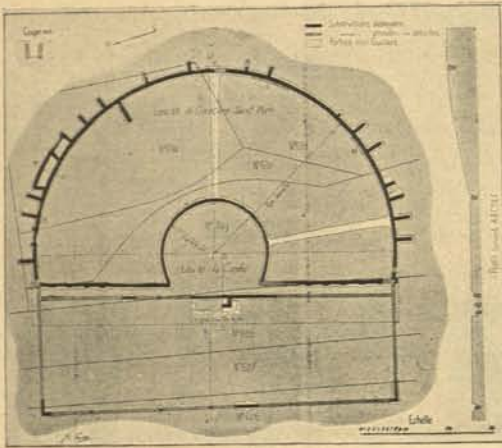


Fig. 3. Alesia.

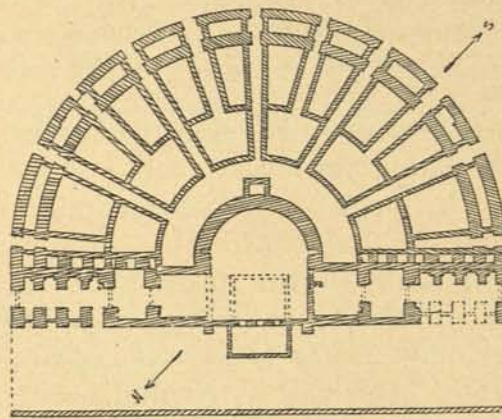


Fig. 4. Avenches.

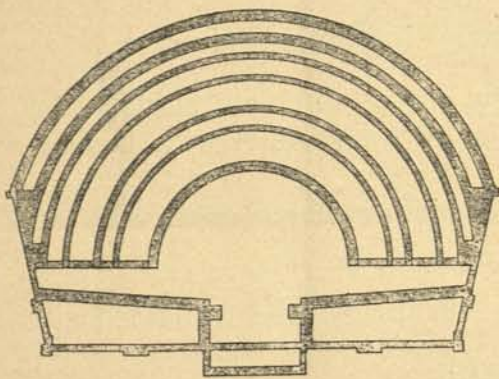


Fig. 5. Berthouville.

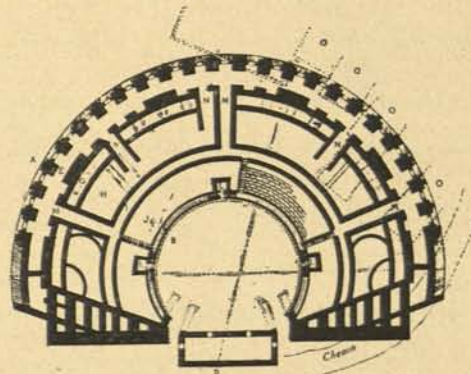


Fig. 6. Drevant.

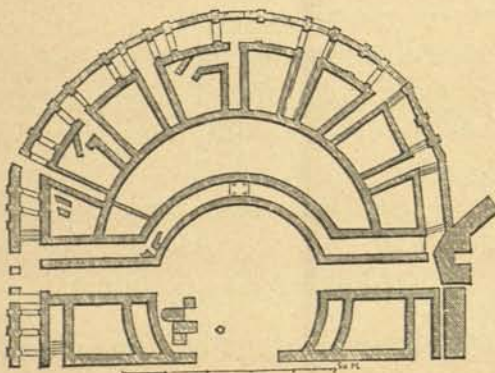


Fig. 7. Lillebonne.

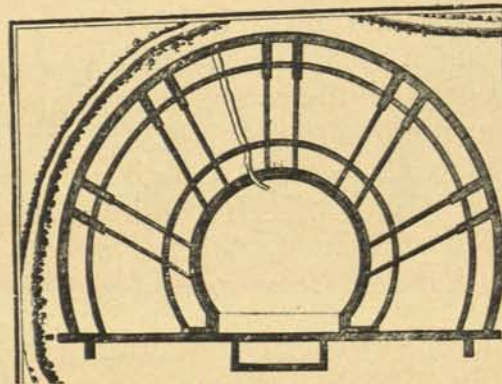


Fig. 8. Valognes.

walls running out into the orchestra from there may have supported a wooden stage, possibly at a later period. No evidence as to date.

G. Mallard, *Bulletin archéologique du comité des travaux historiques et scientifiques*, 1906, pp. 36-43, 'Le Théâtre gallo-romain de Drevant (Cher)'.

Évreux (Eure) (pl. LXV, fig. 1). Excavated 1843-4. Orchestra nearly complete circle. Three gangways, opposite the stage and on the transverse diameter. Stage would appear to have been that portion of a range of small rooms along the façade which touched the orchestra. The section suggests that there may have been a curtain slot, but this is not shown on the plan. A fragment of an inscription may date the theatre in the period of Claudius I. Second-century coins were found in the overlying debris.

L. Coutil, *Archéologie gauloise, gallo-romaine et carolingienne, département de l'Eure*, 1895-1921, vol. iv, Arrondissement d'Évreux, pp. 83-7; J. Bonnin, *Antiquités des Éburovices*, Section II, Évreux, pls. v and vi.

Hedernheim (Frankfurt on Main). Incompletely excavated. Plan certainly not classical. *Cavea* seems to continue round at sides of small stage buildings, which project forwards into a more than semicircular orchestra.

Germania, 13, 1929, p. 76. Forthcoming publication by Dr. Woelcke.

Herbord (Vienne) (pl. LXV, fig. 2). Orchestra very nearly complete circle. Small stage building projects back from façade. Two gangways parallel with façade, but set farther away from stage than the diameter.

R. P. Camille de la Croix, *Mémoire archéologique sur les découvertes d'Herbord dites de Sanxay*, 1883, pp. 36-43.

Jublains (Mayenne). Exterior alone excavated, but this of the truncated circle type. Almost certainly of 'cock-pit' type.

E. Laurain, *Les Ruines gallo-romaines de Jublains*.

Lillebonne (fig. 7). Excavated at intervals in the nineteenth century. Orchestra almost complete circle, surrounded by a wall 5 ft. to 6 ft. high. A probable den for animals in the centre. Two gangways on the transverse diameter. Stage unexcavated since under a main road. On both sides of the lateral gangways there were apparently rooms beneath the *cavea*, since the facing of the walls is continued down. The inner *cavea* continues round, and the upper part almost certainly did, over these rooms, which show traces of having been vaulted over.

A. de Caumont, *Abécédaire d'archéologie, ère gallo-romaine*, 1862, pp. 269-72;

A. de Caumont, *Cours d'antiquités monumentales*, vol. iii, 1830-41, pp. 430-41;

R. Lantier, *Revue archéologique*, 1913, 'La Ville romaine de Lillebonne'.

Néris (Allier). Orchestra much more than a semicircle. No stage buildings found, but probably of 'cock-pit' type.

A. de Caumont, *Abécédaire archéologique, ère gallo-romaine*, p. 279.

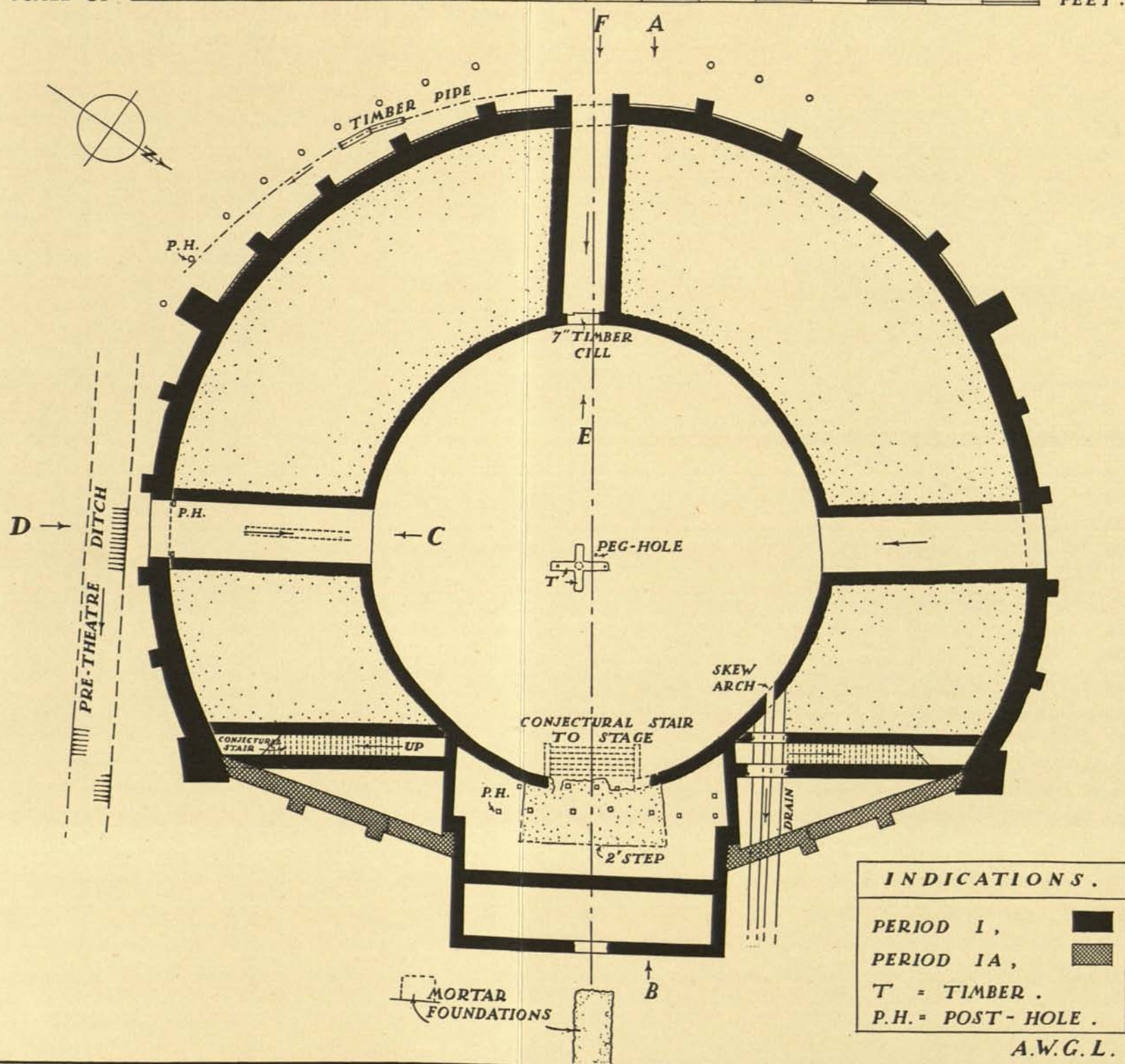
Pitres (Eure). Excavated 1899. Only partially excavated, and no part of orchestra or stage cleared. There would appear to have been a central back gangway, but it is not

V E R U L A M I U M

THE THEATRE.

PERIODS I & IA, c. 140 - 150 A.D.

SCALE OF 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 FEET.



clear whether that descends to the orchestra or not. The general appearance is that of a theatre of the 'cock-pit' type.

L. Coutil, *Louviers et ses environs à travers les âges*, 1929; L. Coutil, *Archéologie galloise, gallo-romaine et carolingienne, département de l'Eure*, vol. ii, pp. 168-97.

St. André sur Cailly (Seine-Inférieure). Excavated 1870. Exterior only excavated, but this is considerably more than a semicircle, and there are gangways on the transverse diameter. Certainly of the 'cock-pit' type.

Cochet, *Répertoire archéologique du département de la Seine-Inférieure*.

Tintignac (Corrèze). Plan rather unusual, since exterior wall curved only at back, ending in straight walls at right angles to the façade. Orchestra wall not completely excavated, but seems to be nearly circular. Small stage buildings project back from the façade. Gangways on the transverse diameter.

V. Forot, *Étude sur les ruines gallo-romaines de Tintignac*.

Triguères (Loiret). Excavated 1857. No plan given. *Cavea* of shape of truncated circle, with small stage building projecting back from the façade. The orchestra wall was not found, but the theatre is also certainly of the 'cock-pit' type.

F. Dupuis, *Mémoires de la société archéologique et historique de l'Orléanais*, vol. iv, p. 390, 'Mémoire sur la découverte d'un théâtre romain à Triguères en 1857'.

Valognes (Manche) (fig. 8). Unexcavated. Orchestra considerably exceeds a semicircle. Stage building projects back from façade. Five radial gangways.

B. de Montfaucon, *L'Antiquité expliquée*, 1719, vol. iii, pp. 248-9, pl. CXLV.

Vieil-Évreux (Eure) (pl. LXV, fig. 3). Excavated c. 1840. Orchestra wall not found, but certainly circular, with small stage building clasping one side of it. Postscenium projects back from the façade. Gangway in centre opposite stage leads to orchestra, with other radial ones only to the *cavea*. Two encircling walls, outer one of different build to inner.

L. Coutil, *Archéologie gauloise, gallo-romaine et carolingienne, département de l'Eure*, 1895-1921, vol. iv, Arrondissement d'Évreux, pp. 151-4; T. Bonnin, *Antiquités gallo-romaines des Éburovices*, section III, Vieil-Évreux, pls. XII and XIII.

Vieux, near Caen (Calvados) (pl. LXV, fig. 4). Excavated 1852-4. In plan, closely resembles theatre of Verulamium, and of nearly identical size. Orchestra slightly oval. Gangways opposite stage and on transverse diameters. Stage a small building clasping orchestra wall. Outer retaining wall of *cavea* probably an addition, since on inner one were originally buttresses and the probable support of an external staircase. Indications of two periods also in stage area. No evidence as to date.

A. Charma, *La Société des antiquaires de Normandie*, 1855, 'Rapport sur les fouilles pratiquées au village de Vieux près Caen'.

B. Buildings a combination of theatres of Romano-Gallic type and amphitheatres

Chenevière (Loiret). Oval arena, but seats only on one side. No trace of stage found.

M. Jollois, *Mémoires sur les antiquités du département du Loiret*, 1836, pp. 1-10.

Lisieux. Unexcavated. Oval in shape, but with seats only on one side.

R. Lantier, *Bulletin archéologique du comité des travaux historiques et scientifiques*, 1911, 'Le Théâtre gallo-romain du Vieux Lisieux'; A. de Caumont, *Abécédaire d'archéologie, ère gallo-romaine*, 1862, pp. 442-5.

Paris, Les Arènes. Excavated 1869-70 and 1883-5. Arena oval in shape, with dens for animals in its wall. Two gangways on the transverse diameter. Stage building clasps the curved side of the orchestra, with no seats on that side of the gangway. The back of the stage ornamented by a series of semicircular niches. No evidence as to date.

F. G. de Pachtère, *Paris à l'époque gallo-romaine*, 1912, pp. 76-80, pl. vi.

C. Theatres of the Classical or 'Vitruvian type'

Arles. Excavated in 1787, 1827, and 1833-55. Normal classical plan. No direct evidence as to date. Statue of Augustus may suggest an Augustan date, soon after the colony was founded in 46 B.C.

Fiechter (*Die baugeschichtliche Entwicklung des antiken Theaters*, p. 86) suggests first century A.D.; F. Formigé, *Mémoires présentés par divers savants à l'Académie des Inscriptions et Belles-Lettres*, vol. xiii, pt. 1, 1923, 'Remarques diverses sur les théâtres romains, à propos de ceux d'Arles et d'Orange'; L. A. Constans, *Arles antique*, 1921, pp. 278-97.

Autun. Excavated at intervals 1820-60. Normal classical plan. Coin of Vespasian found in masonry.

H. de Fontenay, *Autun et ses monuments*, 1829, pp. 177-203.

Bouchards (Charente). Excavated by R. P. de la Croix, 1901-6. Classical plan. *Mémoires de la Société des Antiquaires de l'Ouest*.

Bouzy (Loiret). Excavated 1888-9. Orchestra appears to be of semicircular classical type, but the surrounding wall of the *cavea* is in the shape of a truncated circle, instead of semicircular with rectangular stage buildings added.

G. Vignet, *Mémoires de la Société archéologique et historique de l'Orléanais*, vol. xxiii, pp. 271-6, 'Découverte d'un théâtre romain à Bouzy (Loiret)'.

Cahors (Lot). Classical in plan.

A. de Caumont, *Abécédaire archéologique, ère gallo-romaine*, p. 277.

Champlieu (Oise). Excavated 1850 and 1859. Apparently of classical type with variations. *Mémoires de la Société académique d'archéologie, sciences et arts du département de l'Oise*, vol. iii, pp. 558-88, and vol. iv, pp. 375-407.

Fréjus. Excavated 1920-1. Normal classical plan. No evidence as to date.

A. Donnadieu, *La Pompéi de la Provence, Fréjus*, 1927, pp. 163-74.

Lyon. Insufficiently excavated for plan to be certain, but apparently of classical type.

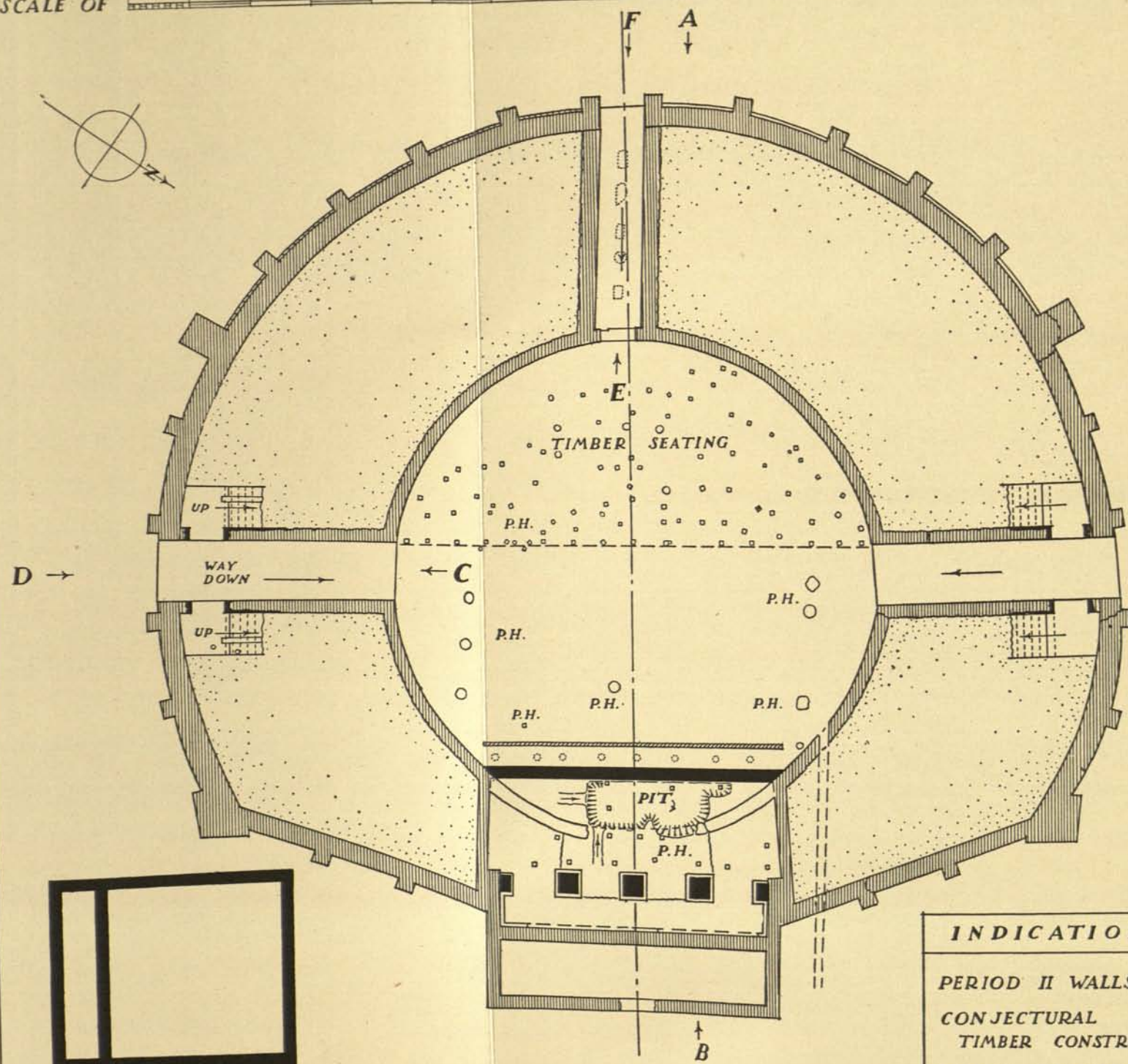
de Colonia, *Antiquités . . . de la ville de Lyon*, 1701; A. de Caumont, *Abécédaire archéologique, ère gallo-romaine*, pp. 263-4.

V E R U L A M I U M

THE THEATRE.

PERIOD II, c. 160 - 170 A.D.

SCALE OF 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 FEET.



A.W.G. L.

Nîmes. Unexcavated, but a model in the museum. Apparently classical.

J. Formigé, *Les Monuments romains de la Provence*.

Orange. Of normal classical plan. Stage buildings well preserved. No direct dating evidence.

Fiechter (*Die baugeschichtliche Entwicklung des antiken Theaters*, p. 87) suggests first century A.D.; Formigé (*v. infra*) suggests first century B.C.; A. Caristie, *Monuments antiques à Orange*, pp. 39-44, pl. xxxiii; J. Formigé, *Mémoires présentés par divers savants à l'Académie des Inscriptions et Belles-Lettres*, vol. xiii, pt. 1, 1923, 'Remarques diverses sur les théâtres romains, à propos de ceux d'Arles et d'Orange'.

Soissons. Insufficiently excavated to determine plan, but probably classical.

J. Leclercq de Laprairie, *Notice sur le théâtre romain de Soissons*, 1849.

Vaison. Excavated 1911-22. Apparently normal classical, but no plan given. No dating evidence given.

J. Sautel, *Vaison dans l'Antiquité*, 1927, pp. 235-54.

Vienne. Classical plan.

A. de Caumont, *Abécédaire archéologique, ère gallo-romaine*, p. 264.

D. Theatres of doubtful type

Besançon. Excavated 1870-5, but not sufficiently to show plan.

A. Castun, *Mémoires de la société d'émulation du Doubs*, 1872, pp. 463-512, and 1875, pp. 495-504, 'Théâtre de Vesontio'.

Bourges. Plan unknown.

A. de Gaumont, *Abécédaire archéologique, ère gallo-romaine*, p. 277.

Paris. Theatre of the Rue Racine. Partially excavated 1861. Insufficiently cleared to show plan. It appears to have three radial gangways opposite the stage. The outer surrounding wall is a stylobate supporting a number of piers. A coin of Nero or Vespasian, a Samian stamp *SILVAVS* and early-second century pottery beneath *cavea*.

F. G. de Pachtère, *Paris à l'époque gallo-romaine*, 1912, pp. 66-8, pl. iv.

SAMIAN POTTERY¹

FIG. 9.

The three sherds illustrated are chosen for their chronological value in relation to the structure.

1. Form 37. Central Gaulish ware. Good glaze and workmanship. Panel decoration, demarcated by sharp wavy lines which terminate in beaded rosettes. Vertical ornament, composed of astragali and wavy line, on which are situated 'crowns' and other motifs. In one panel, a draped man (Déch. 523), as used by the potter *LIBERTVS*, who was chiefly

¹ Thanks are due to Dr. T. Davies Pryce, F.S.A., and Mr. J. A. Stanfield for examining and reporting upon the Samian pottery from the site.

active in the reigns of Trajan and Hadrian; in the adjoining panel, a female captive (Déch. 644).

From a stratum immediately ante-dating the building of the theatre. It is ascribed by Dr. Davies Pryce *c.* A.D. 125.

2. Form 37. Central Gaulish ware. Fair glaze and workmanship. The ovolo has a beaded-rosette terminal. Panel decoration demarcated by sharp wavy lines which

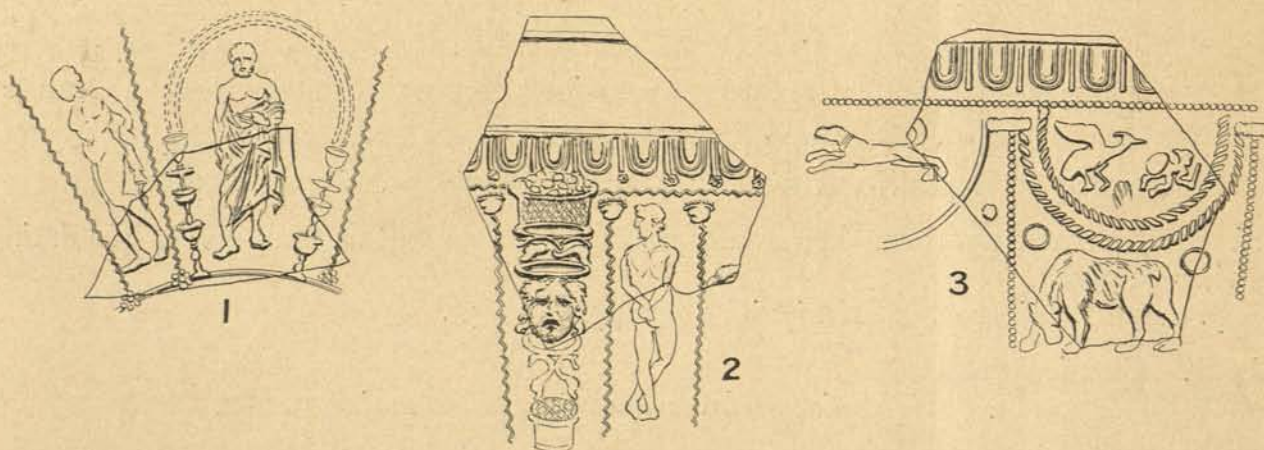


Fig. 9. Samian sherds ($\frac{1}{2}$).

terminate in 'crowns', as frequently found in ware of the Trajanic and early Hadrianic periods. In one panel, an assembled ornament composed of a basket of fruit (cf. Déch. 1069, CINNAMVS), conjoined dolphins and a mask (cf. Déch. 678) as used by the Trajan-Hadrian potter ATENICVS. In the adjoining panel, the male captive (Déch. 643). From the same layer—no. 1. Dated by Dr. Davies Pryce *c.* A.D. 125-30.

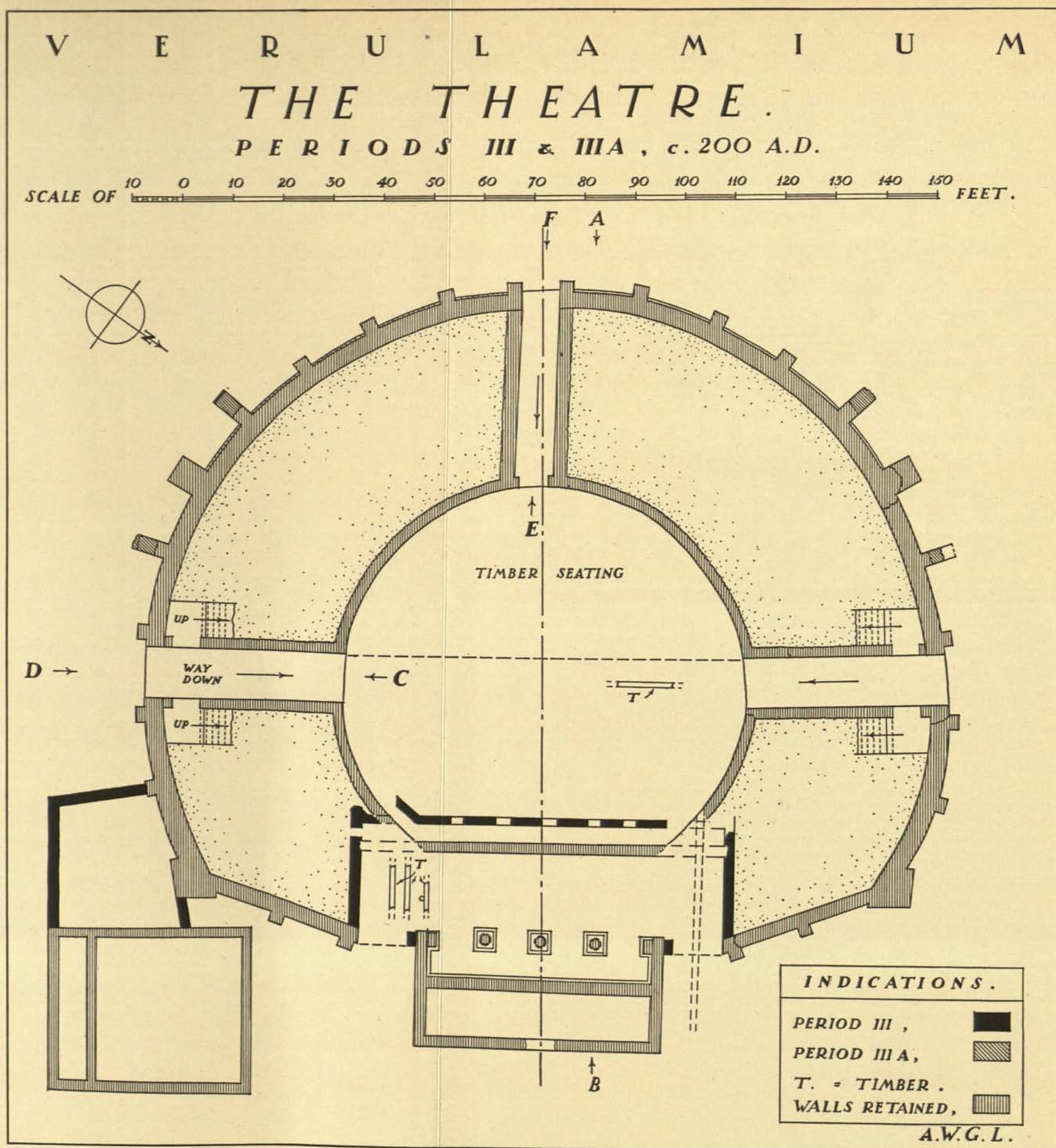
3. Form 37. Lezoux ware. Negligent decoration and poor glaze. The ovolo is characteristic of the Antonine period. Panel decoration demarcated by rows of large beads. In the coarsely executed wreath-festoon are a crane and a pygmy. Beneath the festoon is a bear to left (Déch. 817).

From the period III make-up of the surrounding road. It is ascribed by Dr. Davies Pryce to the period A.D. 160-70, and by Mr. Stanfield to a slightly earlier date.

5. COARSE POTTERY

Only a few representative examples of the coarse pottery are here illustrated. Great quantities of it were found, especially in the 'brown earth' and 'black earth' which represent the debris deposited in the orchestra and stage when the theatre had fallen finally into disuse. Both deposits contain coins of the House of Theodosius and are therefore not earlier than A.D. 379. The 'black earth' overlay the 'brown earth' but does not appear to have been significantly later in date. The pottery from these deposits contained very few recognizable survivals of pre-fourth-century date and may for the most part be regarded as equivalent in date with the deposits themselves.

Castor ware does not appear in deposits prior to period III (end of second century) but occurs in great quantities in period IV (late third century); and interesting com-



parisons can be made between the Castor ware of this period and that found in the 'brown earth' and 'black earth' deposits noted above. The third-century Castor ware is mostly thin and light, whilst in the later deposits it was commonly thick and heavy, with a substantial black slip over the white clay. The most common type of decoration on the ware in period IV was that with white paint, whilst in the 'brown' and 'black' earths a negligible amount of this technique was found, and rouletting, often somewhat coarse, was the normal form of ornament. In period IV, bases both of the small high type and of the larger and lower type were found, the latter predominating; in the 'brown' and 'black' deposits, on the other hand, the high type was almost universal. There seems also to be a distinction between the rims of the beakers in the two periods, for in period IV they are turned over very flatly (fig. 10, no. 14), whilst in the later deposits they are more rounded and developed (fig. 11, no. 22). Thumb-pots or folded beakers are very common in period IV, whilst only one example occurs in the 'black earth' and none in the 'brown earth'. On the other hand, the most common form of the later levels—the flanged bowl (fig. 10, no. 16)—is represented by only one example in period IV.

FIG. 10.

1. Mortarium of well-levigated buff ware with collared flange. From the earliest flooring of the orchestra, period I (second quarter of the second century A.D.). The type is of first-century origin and is closely related to types which occur in the Claudian period of Hofheim, Colchester, and Richborough (*Third Richborough Report*, p. 184, no. 348). It is not common at Verulamium but survived there occasionally into the early part of the second century.

2. Part of large jug of micaceous buff ware. Period I, second quarter of the second century A.D.

3. Part of ring-necked jug of buff-coated red ware. From the orchestra, period II (mid-second century A.D.).

4. Similar jug. From the filling of the curtain-slots in front of the stage. Period II a (shortly after the middle of the second century A.D.).

5. Large vessel of grey ware. Period III (end of second century A.D.).

6. Bowl of grey ware. Period III (end of second century A.D.).

7. Small handled beaker of Castor ware, reddish clay with brown-black metallic slip. Pattern of running deer moulded and applied. Period III (end of second century A.D.).

8-9. Grey dishes with smooth lattice pattern. Period III (end of second century A.D.).

10. Buff mortarium. Period III (end of second century A.D.).

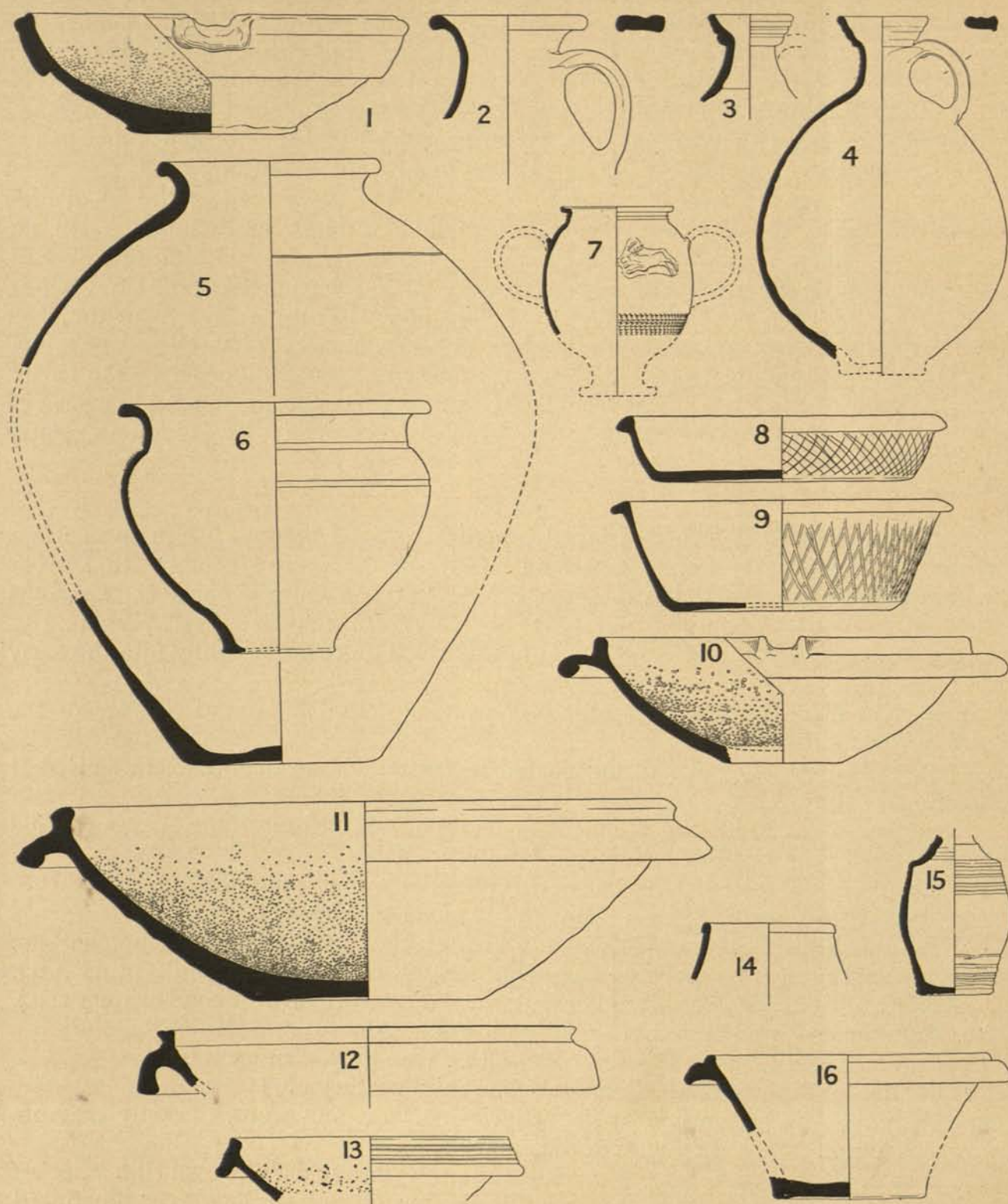
11. Buff mortarium, spout missing. Period IV (late third century A.D.).

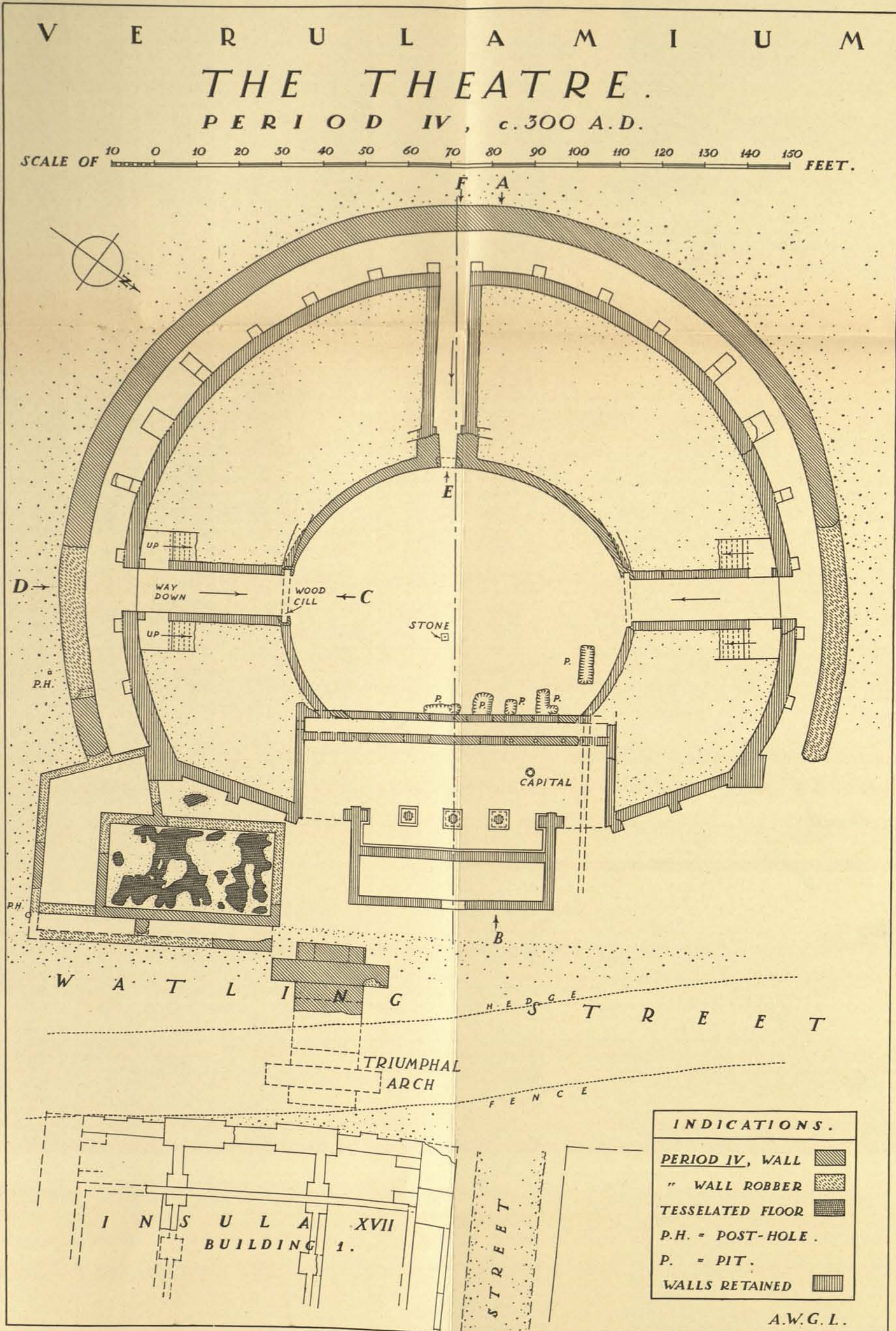
12. Orange-buff mortarium. Period IV (late third century A.D.).

13. Hammer-head mortarium of finely levigated light buff ware, the only example of this type found. Period IV (late third century A.D.).

14. Rim of Castor ware beaker of reddish ware with fine dark brown slip. Period IV (late third century A.D.). This rim should be contrasted with the later type illustrated below, fig. 11, no. 22.

15. Part of a barrel-shaped vessel, probably a jug of reddish ware with a dull red external slip. Period IV (late third century A.D.).

Fig. 10. Coarse pottery ($\frac{1}{4}$).



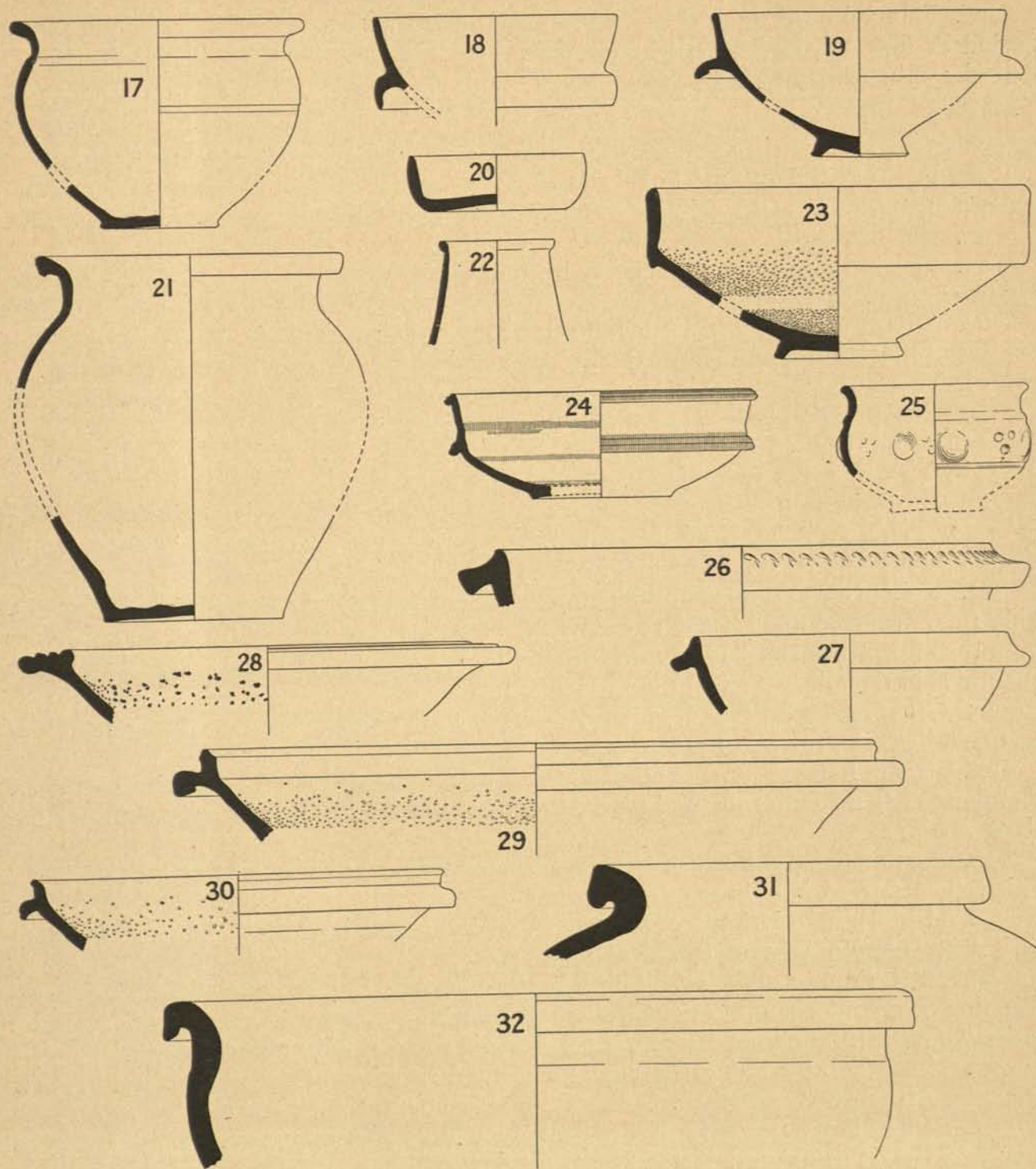


Fig. 11. Coarse pottery from rubbish-pit filling of orchestra ($\frac{1}{4}$).

16. Flanged bowl of hard white ware with grey slip. One example only came from period IV (late third century) but a considerable number was found in the fourth-century deposits of brown and black earth.

FIG. 11.

All the types illustrated in this figure are from the 'brown' or 'black' earths and are of fourth-century date. Unless otherwise specified, the types occur in both deposits.

17. Bowl of hard orange-red ware.

18. Flanged bowl of fine orange-red ware in imitation of Samian form 38. From the 'brown' earth.

19. Analogous type to no. 18 with traces of a red slip.

20. Small dish of orange-red ware. One example only, from the 'brown' earth.

21. Vessel of coarse vesiculated ware with brown surface and grey core. A great deal of this fabric and type was found in the two deposits.

22. Part of beaker of brownish-grey ware with grey slip. This rim should be contrasted with the earlier type illustrated in fig. 10, no. 14.

23. Mortarium of orange ware with grey core and red slip. Imitation of Samian form 45. This type occurred abundantly in both deposits, particularly in the 'brown' earth but only one sherd of genuine form 45 was found in these strata.

24. Bowl of hard white ware with orange painted decoration internally and externally. This type occurred abundantly at e.g. Segontium and Richborough in deposits dating from the end of the third to the end of the fourth century. It was found in greater quantities in the 'black' earth than in the 'brown' earth.

25. Grey bowl with repoussé bosses divided by triple indentations. Other examples occurred both in grey and in black ware.

26. Part of flanged bowl of coarse vesiculated orange-coloured ware with grey core. The flange has a rough rouletted pie-crust pattern. Only one example was found, in the black earth.

27. Part of flanged bowl of grey vesiculated ware somewhat analogous to no. 26. This type occurred only in the black earth.

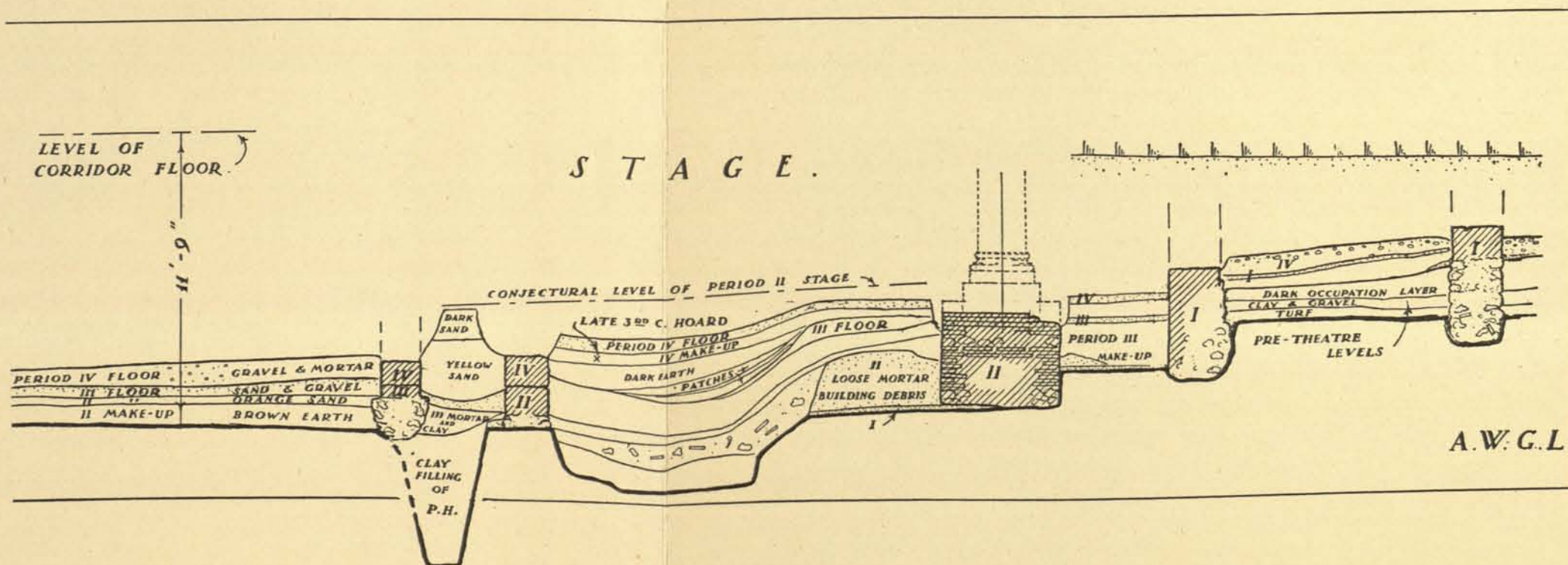
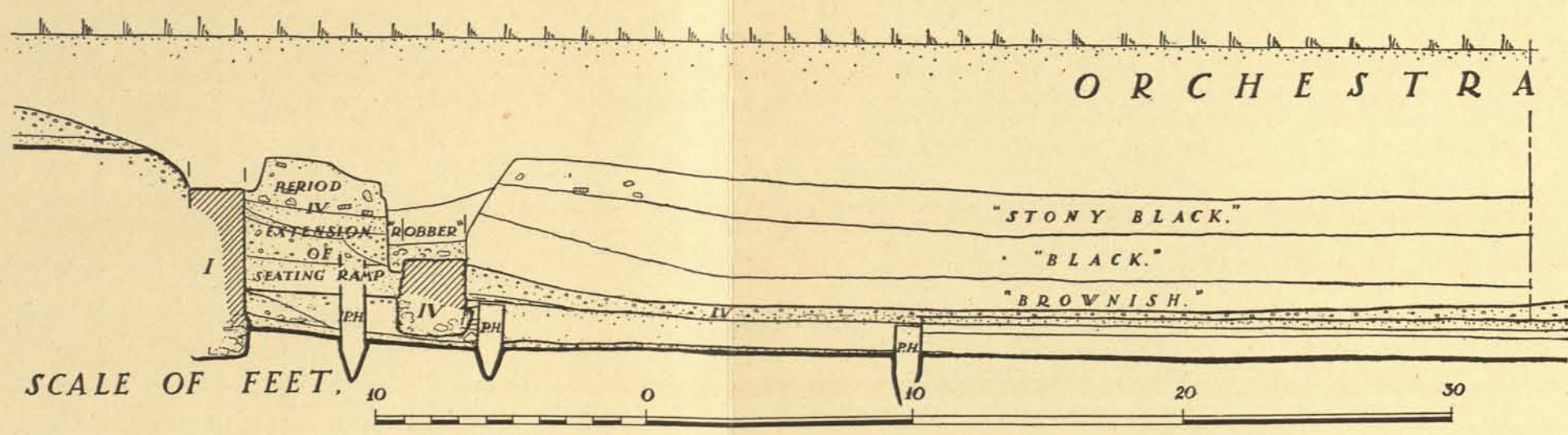
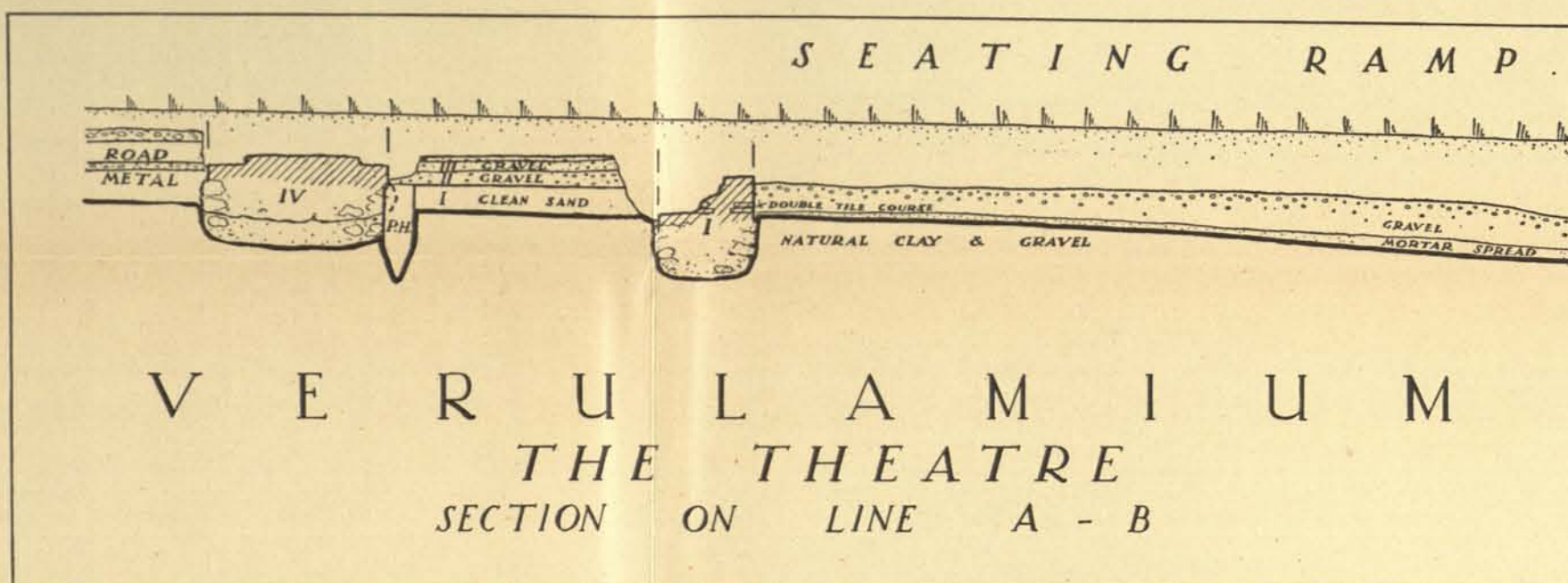
28. Mortarium of buff ware with three grooves on the horizontal flange and coarse dark grit. Only one example was found, in the black earth.

29. Mortarium of buff clay. This was the only type of mortarium (other than those imitating Samian form 45) in the 'brown' earth, where it occurred abundantly. It was entirely absent from earlier levels, but recurred in the overlying 'black' earth.

30. Mortarium of orange-red clay. The type is akin to Samian form 43. A few examples occurred in the 'brown' earth, but only one in 'black' earth.

31. Rim of large storage vessel of coarse buff clay with grey core. This type goes back to a Belgic origin, and lasted at Verulamium with minor modifications (such as the squaring of the rim in the present example) throughout the Roman period. The type was common in the two fourth-century deposits.

32. A variant of no. 31, distinguished by the relatively large diameter of the rim which oversails the body in profile. This is a late feature entirely absent from earlier examples of the type.



6. OBJECTS OF METAL, BONE, ETC.

FIG. 12.

1. Bronze bracelet. From the late fourth-century 'black earth'. A characteristically late Roman type, found e.g. at Lydney (*Lydney Report*, fig. 17, D).
2. Bracelet with snake's-head terminals. Decorated with incised dots and wedges. From the late fourth-century 'brown earth'.
3. Bronze bracelet decorated with zigzags in relief. From the late fourth-century 'black earth'.
4. Bronze bracelet. From the late fourth-century 'brown earth'.
5. Coiled-up fragment of bronze bracelet, with well-executed snake's-head terminal. From a deposit of the latter half of the second century.
6. Bronze wire ring. Late debris (mostly fourth century) on floor of S. gangway.
7. Bronze ring with bezel of blue glass, with white glass insets. From the late fourth-century 'black earth'.
8. Bronze ring or portion of bracelet coiled up. Decorated with incised herring-bone pattern. From the late fourth-century 'black earth'.
9. Ring (probably ear-ring) of coiled flattened bronze wire, with hooked ends. From the late fourth-century 'black earth'.
10. Bronze ring, fastened by a hole over a stud. Decorated with incised zigzags. Unstratified.
11. Jet bead, pierced longitudinally by two holes. From the late fourth-century 'brown earth'.
12. Penannular brooch, decorated with incisions on the upper edge, and with recurved and nipped terminals. From the late fourth-century 'brown earth'. Cf. *Lydney Report*, p. 78.
13. Disc brooch, with field of blue enamel, in which are bronze roundels and central circle. From the late fourth-century 'black earth'.
14. Bronze bobbin. Top surface decorated with incised lines, vaguely reminiscent, perhaps, of a scallop-shell. From the S. gangway, period II (mid-second century).
15. Blue glass intaglio showing two figures clasping hands, one naked except for a helmet, the other draped and bare-headed. From the late fourth-century 'black earth'.
16. Bronze buckle representing opposed dolphins. From the late fourth-century 'brown earth'. The type occurs in Romano-Frankish contexts in Gaul (T. Eck, *Les deux cimetières gallo-romains de Vermand et de S. Quentin*, pl. xv), and probably as a late Roman or sub-Roman survival, in the Saxon cemetery at Mitcham, Surrey (*Arch.* lx, 53, fig. 5).
17. Bronze nail-cleaner. From the late fourth-century 'brown earth'.
18. Bronze nail-cleaner, with butt-end pierced for suspension. From the late fourth-century 'brown earth'.
19. Stone palette, for mixing ointments, pigments, &c. Edges bevelled to fit into a metal container. Cf. *Bonner Jahrbücher* 111/112, p. 401, and *Lydney Report*, figs. 19, 86. From the late fourth-century 'black earth'.
20. Bone pin, with head shaped like an axe. Similar pins have been found on a

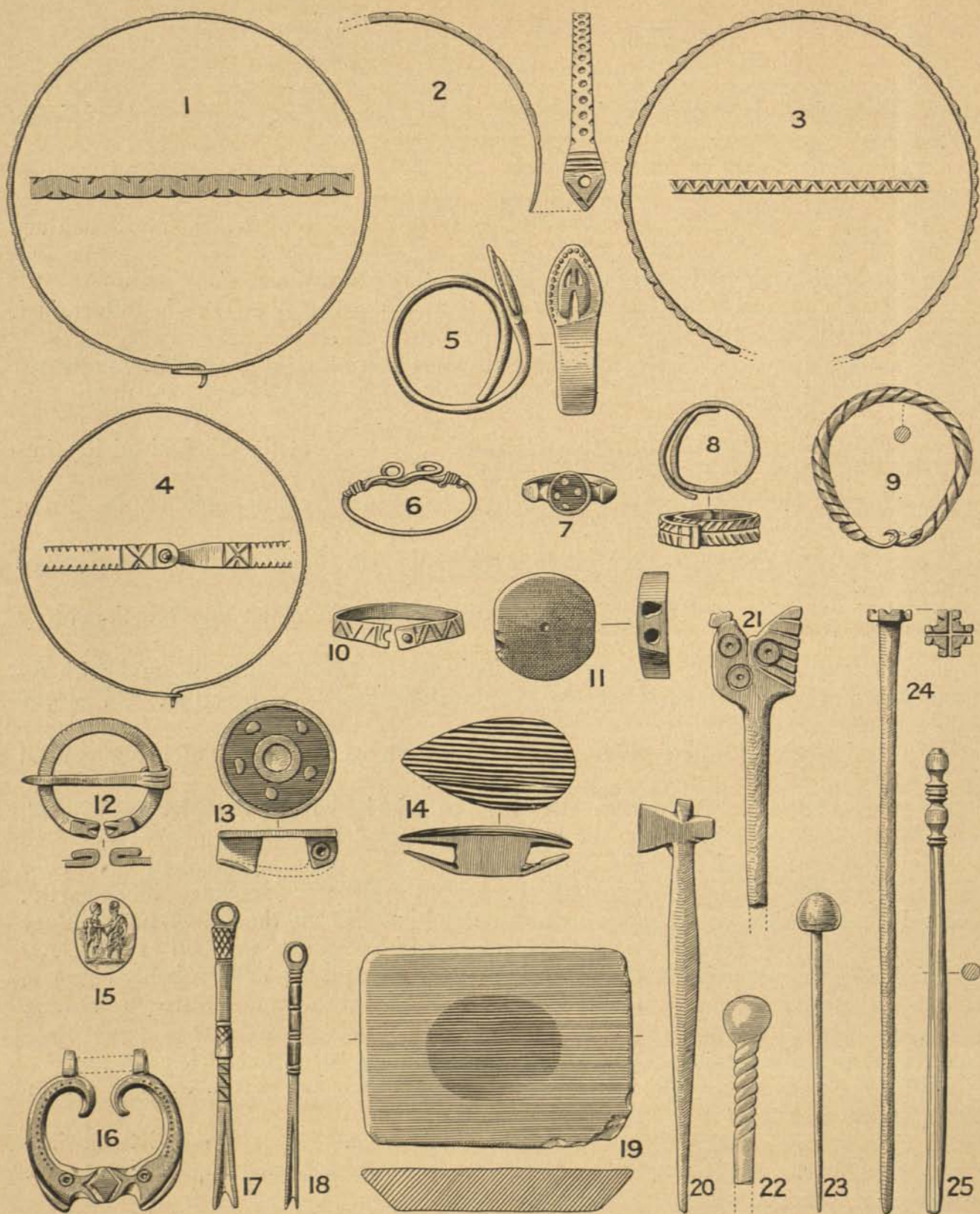


Fig. 12. Objects of metal, bone, etc. (†).

SECTION C - D THROUGH THE SOUTH GANGWAY.

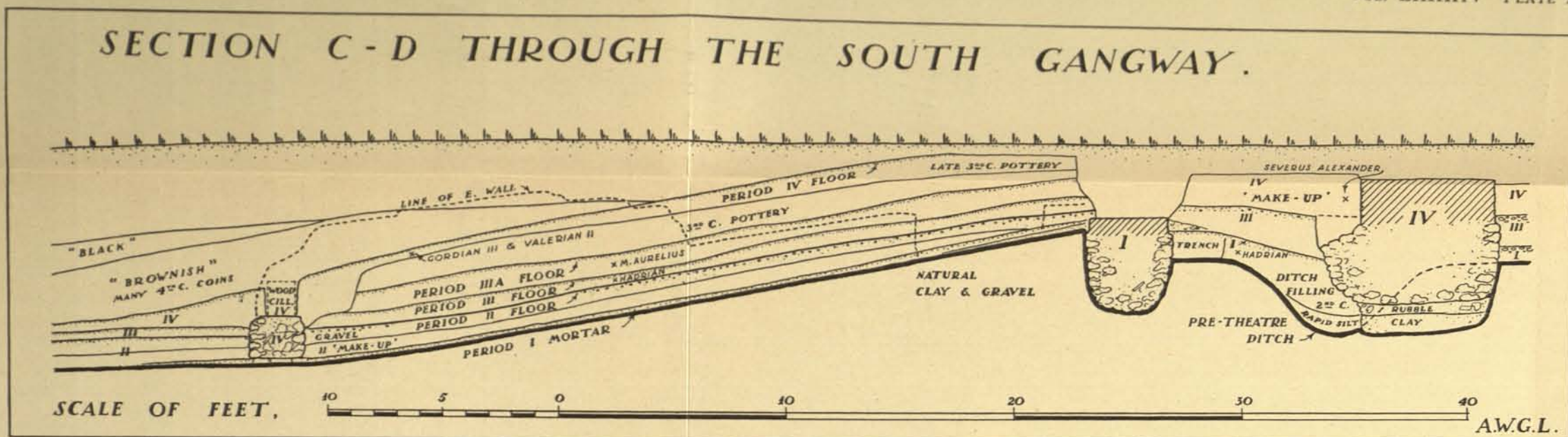


Fig. 1

SECTION E - F THROUGH THE WEST GANGWAY.

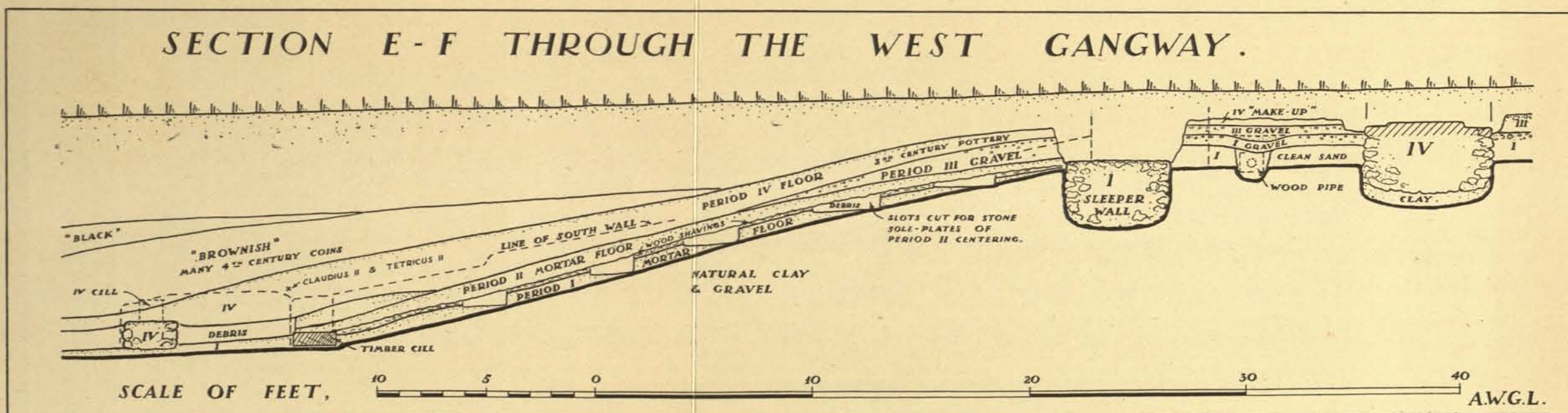


Fig. 2

SECTION BETWEEN WALLS OF "CURTAIN SLOT" IN FRONT OF THE STAGE.

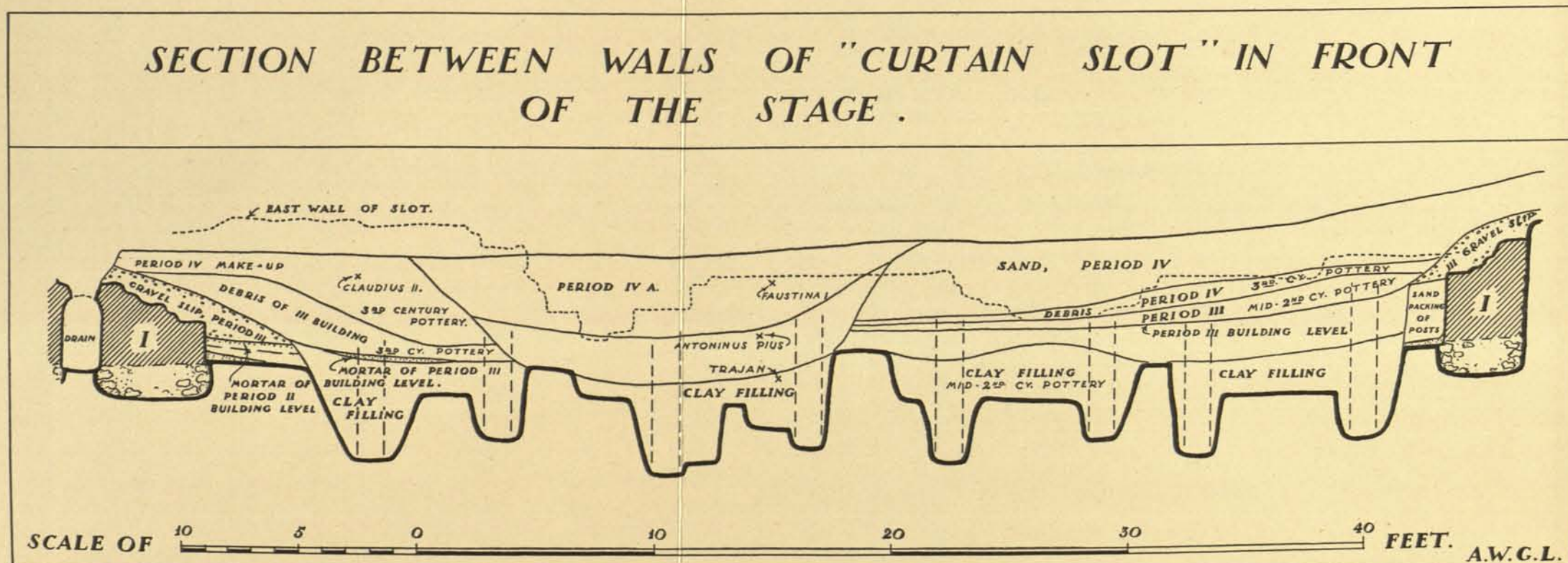


Fig. 3

number of Roman sites (see *Lydney Report*, figs. 18, 61). From the late fourth-century 'brown earth'.

21. Part of a bone pin, with the head rather crudely carved in the shape of a hen. From the late fourth-century 'brown earth'.

22. Part of glass pin, with twisted stem. From the late fourth-century 'black earth'.

23. Bronze pin, with green glass head. From the fourth-century 'brown earth'.

24. Bronze pin, with cross-shaped head decorated with incisions. From the late second-century filling of 'curtain-slot'.

25. Bronze pin. From the make-up of the late third-century stage.

7. STONE SAMPLES FROM VERULAMIUM

By DR. NORMAN DAVEY

(of the Building Research Station, Watford)

Two samples of limestone collected on December 23, 1934, from the columns of the Roman Amphitheatre, Verulamium, and a sample of stone tiling, labelled Pit II, 6 ft., have been examined microscopically.

Coping stones. Of the two limestones one is an oolitic rock, with a structure of the 'Monk's Park' type. That is to say it consists of porous oolitic grains set in a matrix of crystalline calcium carbonate (calcite). It does not imply that it originated in the Monk's Park quarries, Somerset.

The other limestone is a shelly-oolite bearing a resemblance in general appearance to stone now obtainable from the Clipsham quarries, Rutland, or to the similar stone formerly quarried near Barnack, Northamptonshire. The oolitic grains are rather more similar in structure to those found in stone from the Ketton quarries than to those found in Clipsham or Barnack stone. In present supplies of Ketton stone, shells are of infrequent occurrence.

Limestones of generally similar character to those described occur in the Great Oolite and Inferior (lower) Oolite series of the Jurassic system, the outcrop of which extends in a north-westerly direction between Dorset and Lincolnshire. Being shallow water deposits these oolitic rocks are subject to marked variations in character. Hence it is impossible to suggest the probable origin of the samples in question with any degree of certainty. The most important districts from which oolitic limestones of such character are, or have been, obtainable are those of Bath, Cheltenham, Oxford, Stamford, and Grantham.

Tiles. The stone tile is a fissile calcareous sandstone. Small, angular quartz grains and limestone and shell debris are cemented together in a continuous matrix of fine-grained calcite.

Fissile sandstones have long been quarried and prepared for roofing purposes in several districts on the Jurassic outcrop, the most important centres being Collyweston, Northamptonshire, and Stonesfield, near Woodstock, Oxfordshire. The present sample bears a general similarity in structure to the Collyweston and Stonesfield 'Slates', but, again, it is not possible to state the origin of the sample with certainty.

Marble. A fragment of marble found is probably from Purbeck.

INDEX TO VOLUME LXXXIV

A

- Adam and Eve stones, the, near Avebury, 101-2.
 Ailette, the German, 70.
 Albert Achilles, the Elector, 84 *n.* 2.
 Albrecht II, altar of, 79.
 Alder charcoal, 159.
 Amalfi, the silk trade of, 169-70.
 Anatomical examination of the remains of the princes in the Tower, 15-24.
 Andesite pebble, 117.
 Andrews, dean Gerrard, the arms of, 54.
 Angels, a choir of, in Westminster Abbey, 63-6.
 Animal remains from Avebury: deer, red-, 104, 105 *n.* 1, 112-13, 115, 119, 120, 121, 125, 126, 136, 148-55, 158; —, roe-, 119, 154, 158; dog, 120, 158; fowl, 159; fox, 159; frog, 159; horse, 157; mole, 159; ox, 115-16, 121, 148, 157-8; pig, 158; sheep, 147, 158; stag, 102; toad, 159. —, from Verulamium, 240.
 Anne of Denmark, queen, 30.
 Antler picks, 104, 105 *n.* 1, 112-13, 115, 121, 125, 126, 148-55; rakes, 121, 127, 136, 154, 155.
 Antoninus, coin of, 229.
 Antoninus Pius, coins of, 231, 233, 234, 23.
 Arènes, Les, Paris, 244-5.
 Arensberg, Gottfried von, his armour, 77.
 Aristotle on silk, 166, 167.
 Armaroli, Antonio degli, armourer, 87.
 Armet, the, in German armour, 80.
 Armour, plate, its evolution in Germany in the fourteenth and fifteenth centuries, 69-89; list of armour not mentioned by Laking, 90; list of, in military effigies, 91-5; select bibliography, 96-7.
 —: ailette, 70; aventail, 71, 74, 79, 80; bard, 84; bascinet, 71, 74-5, 79, 80, 90; bells, 78; besagues, 80, 83; bevor, 79, 80, 81, 82, 84, 86; breastplate, 76-7, 78, 79, 80-1, 83; canons, 83; *cervellière*, 74; chanfron, 84 *n.* 3; cheeks, 80; coif, 70, 74; couters, 78, 83, 85; crossbow, 79; cuisses, 83, 85, 86; culet, 86; gauntlets, 77, 79, 83, 84, 85, 90; greaves, 79, 84, 86; harness, 78, 79, 81, 82, 85, 88; hauberk, 70, 71, 76, 78, 81, 90; helm, 70, 74, 75, 90; *Hunskugel*, 75, 80; jupon, 77, 78; *Klappvisier*, 75, 90; leg-harness, 77, 79; *lisières d'arrêt*, 81, 86; mittens, 70, 79; nasal, 71, 75; pauldrons, 83, 84, 85, 86, 88; pavises, 78, 90; placate, 88; poleyns, 84; rerebraces, 77, 79, 83; rivets, 85, 86; rump-plate, 86; sabatons, 79, 84, 86; sallet, 80, 81-2, 83, 84, 85, 86; shields, 78, 79, 90; shirt, 79; side-plates, 86; skirt, 77, 79, 80, 81, 84; sleeves, 71, 77, 78; sollerets, 82; spurs, 79, 82; *Sturmhaube*, 75; surcoat, 70, 76; sword, 79; tassels, 78; tassets, 81, 83, 84, 86, 88; vambrace, 77, 78, 79, 83, 86; vervelles, 74; visor, 74-5, 79, 80, 82, 83, 90; war-hat, 75, 79, 80.
 Armstrong, C. A. J., 13.
 Arrowheads: flint, 131 *n.* 2; iron, 111.
 Arundel, Archbishop, the arms of, 51, 52, 54, 57.
 Arundel, Richard, earl of, the arms of, 54, 55.
 Asiatici M, potter's stamp, 229.
 Asprey, H., 213.
 Aubrey, John, on Avebury, 99, 101, 103, 117.
 'Aucissa' fibula from Avebury, 116, 155-7.
 Augsburg, the armour platers of, 69, 85.
 Aurelian, coin of, 237.
 Aurelius, coin of, 228.
 Austin, Mr. and Mrs. George, their work on the Canterbury bosses, 50, 53.
 Avebury excavations, the, 1908-1922: introduction, 99-102; previous excavations, 102-5; the excavations, 105-7; description of the plan, 107-10; cutting I, 110-14; cutting II, 114-17; cutting III, 117-18; cutting VIII, 118-22; cutting IX, 123-7; excavations in the position of the ancient southern entrance, 127-30; cutting X, 130-1; excavation round a prostrate stone, 131-2; the Avebury ditch: the moat theory, 132-4; average section of the southern fosse, 134-6; the pottery, 136-41; the flint implements, 141-5; skeleton and burnt material, 145-8; picks of red-deer antler, 148-55; the Aucissa fibula, 155-7; animal remains, 157-9; charcoals, 159-60; the non-marine mollusca, 160-1; concluding remarks, 161-2.
 —, animal remains from: deer, red-, 104, 105 *n.* 1, 112-13, 115, 119, 120, 121, 125, 126, 136, 148-55, 158; —, roe-, 119, 154, 158; dog, 120, 158; fowl, 159; fox, 159; frog, 159; horse, 157; mole, 159; ox, 115-16, 121, 148, 157-8; pig, 158; sheep, 147, 158; stag, 102; toad, 159.
 —, flints from: arrowhead, 131 *n.* 2; cores, 118, 141, 143, 144, 147; flakes, 104, 113, 126, 131, 141-5, 147; hammerstone, 141, 144, 148; knives, 113, 119, 126, 142, 143, 144; miscellaneous, 104, 115,

- 135, 143-4; saw, 131 *n.* 2; scrapers, 104, 115, 118, 119, 126, 131 *n.* 2, 141, 143, 144; sickle (?), 143, 144.
- Avebury excavations, the, 1908-1922, objects, other than animal remains, flints, and pottery, from: arrowheads, 111, 131 *n.* 2; bones, worked, 121, 127, 131, 136; bracelet, 126; charcoals, 120, 130, 143, 159-60; cleat, 119; coins, 111 *n.* 2, 114 *n.* 1, 131 *n.* 1; fibula, 119, 155-7; fossils, 116, 160-1; horseshoe, 111 *n.* 3; human remains, 113, 115, 119, 126 *n.*, 135, 140, 142, 145-8; iron pyrites, 120; knife, 111 *n.* 3; pebbles, 116-17, 121; picks, antler, 104, 105 *n.* 1, 112-13, 115, 121, 125, 126, 148-55; pin, 127, 131; pipe, tobacco-, 114 *n.* 1; rakes, antler, 121, 127, 136, 154, 155; ring, 126; shovels, 113 *n.* 2, 115-16, 136; whetstone, 126.
- , pottery from: beaker, 126; bowls, 138; miscellaneous, 102, 103, 104, 105, 112, 114, 115, 117 *n.*, 119 *n.*, 120, 126, 128, 131, 132, 135, 136-41, 147; pots, 112 *n.* 1, 114 *n.* 2, 115 *n.*, 117 *n.*, 119 *n.* 2; saucer, 119; tile, 112; vessels, 112, 115 *n.*
- Avebury, Lord, 127, 128; on Avebury, 100.
- Aventail, the, in German armour, 71, 74, 79, 80.
- B**
- Baden, William Markgraf von, his armour, 88.
- Balfour, Henry, 105-6.
- Bard (horse-armour), German, 84.
- Bascinet, the, in German armour, 71, 74-5, 79, 80, 90.
- Bassett, Thomas, effigy of, 75.
- Bayley, canon William Frederic, the arms of, 53, 57.
- Bead, jet, 259.
- Beakers, pottery, 126, 217, 226, 255, 258.
- Beaker-type pottery, 135, 136-8.
- Beaufort, Cardinal, the arms of, 59, 61.
- Beckhampton Avenue, the, Avebury, 100 *n.* 1, 101, 110.
- Bedford, George Nevill, duke of, the arms of, 58-9.
- Bell, carving of a, 64, 66.
- Bells on German armour, 78.
- Bentley, William, 66 *n.* 2.
- Berlichingen, Beringer von, effigy of, 77, 78.
- , Dietrich von, effigy of, 84.
- Besagues in German armour, 80, 83.
- Bevor, the, in German armour, 79, 80, 81, 82, 84, 86.
- Bird motives in art, 188-9, 192-3.
- Bishop, W., 14.
- Black Prince's Chantry Chapel, Canterbury, its roof-bosses, 47-8.
- Black Prince, his arms, 53.
- Boar remains from Avebury, 120.
- Bobbin, bronze, 259.
- Bohemian kings, effigies of the, 76.
- Bokyngham, bishop John, the arms of, 54, 56.
- bombycina*, 168.
- Bone objects: miscellaneous, 121, 127, 131, 136; pins, 127, 131, 259, 261; shovels, 113 *n.* 2, 115-16, 136.
- Boscawen, canon John, the arms of, 56.
- Bosch, Hieronymus, the pictures of, 79.
- Bosses, roof-, in Canterbury Cathedral, 41-61.
- Bourchier, Cardinal, the arms of, 59.
- Bowls, pottery, 138, 217, 225, 226, 229, 230, 255, 258.
- Bracelets, bronze, 126, 259.
- Brackenbury, Sir Robert, and the death of the princes, 6-7.
- Braunfels, Schloss, armour in, 74.
- Breastplate, the German, 76-7, 78, 79, 80-1, 83.
- Brian, Sir Guy, effigy of, 77, 78.
- British Association, the, excavations at Avebury, 103, 105-62.
- Bronze objects: bobbin, 259; bracelets, 126, 259; brooch, 259; buckle, 259; fibula, 119, 155-7; nail-cleaners, 259; pins, 261; rings, 126, 259.
- Bronze Age pottery, 115.
- Brooch, bronze, 259.
- Brookhill of Calehill, the arms of, 56.
- Brotherton, the arms of, 57.
- Brown, canon Walter, the arms of, 53.
- Browne, J., water-colour by, 108 *n.* 3.
- Buck, Sir George, 26.
- Buckingham, Humphrey Stafford, duke of, the arms of, 59.
- Buckle, bronze, 259.
- Buckthorn charcoal, 159.
- Buddhist legend of the rescue of a Nāga, 194-6.
- Buttin, C., on armour, 70, 76, 89.
- Byzantine silk, 190; silk monopoly, the, 169-70.
- C**
- Caldwell, Samuel, his work on the Canterbury roof-bosses, 50-1.
- Camp, S. J., 82.
- Canons in German armour, 83.
- Canterbury Cathedral, the roof-bosses in: Foliage and figure bosses: the Treasury and the water-tower, 41-2; the Presbytery, Quire, and eastern Transepts, 42-6; the eastern part of the Crypt, 46-7; the Black Prince's Chantry Chapel, 47-8; the western half of the Cathedral, 48-50; Heraldic Bosses in the western half, 50-61.
- , seal bags in the Treasury of, 163-211.
- , the city of, the arms of, 55.
- , Priory, the arms of the, 55, 57, 60.
- , the see of, the arms of, 54-60.

Capelli, Cristoforo de, armourer, 87.
 Capital, Corinthian, 222.
 Caracalla, coin of, 237.
 Carausius, coins of, 233, 234, 236, 237.
 Carilli M, potter's stamp, 221.
 Caroë, W. Douglas, on Canterbury roof-bosses, 48-9.
 Cave, C. J. P., 'The Roof-bosses in Canterbury Cathedral', 41-61.
 — and L. E. Tanner, 'A Thirteenth-century Choir of Angels in the North Transept of Westminster Abbey and the Adjacent Figures of Two Kings', 63-7.
 Cawne, the arms of, 60.
 Censer, carving of a, 64, 66.
cervellière, the, in German armour, 74.
 Chalice, carving of a, 64, 66.
 Chanfron, the, in German armour, 84 n. 3.
 Charcoals from Avebury, 120, 130, 148, 159-60.
 Charles I, 30, 31, 32.
 Charles II, and the princes' remains, 1, 8-10.
 Cheeks in German armour, 80.
 Cheyne, Thomas, brass of, 77 n. 5.
 Chichele, Archbishop, the arms of, 52, 58.
 Chicheley, Sir Thomas, 8, 10, 11, 15 n.
 Chichester Cathedral, bosses in, 44, 46.
 Chidiok, Sir J., the tomb of, 84 n. 1.
 Chillendon, prior Thomas, 51-2; carving of, 48-9.
 Chinese silk, 166-9, 198, 199.
 Choir of angels in Westminster Abbey, a, 63-6.
 Christopher, Duke, effigy of, 75.
 Churburg, armour at, 75, 79, 81.
 Cinnam, potter's stamp, 237.
 Circles, the, at Avebury, 108-10, 161-2.
 Cithera, carving of a, 65.
 Clare, Gilbert de, glass of, 71 n. 2.
 Clarence, George duke of, the arms of, 58.
 Clarence, Thomas duke of, effigy of, 60; the arms of, 61.
 Clark, J. G. D., 'The Flint Implements, Avebury Excavations', 106, 141-5.
 Clarke, W. G., 149.
 Claudius, coins of, 214, 217.
 Claudius II, coins of, 234, 235, 237.
 Clay tobacco-pipe, 114 n. 1.
 Cleat, iron, from Avebury, 119.
 Coif, the, in German armour, 70, 74.
 Coins from Avebury, 111 n. 2, 114 n. 1, 131 n. 1; Verulamium, 214, 217, 221-41, 254.
 Colkin, the arms of, 55.
 Colman, Lorenz, armourer, 85, 88.
 Comfort, B., 27.
 Constantine, House of, coins of the, 240.
 Constantius II, coin of, 239.

Cores, flint, 118, 141, 143, 144, 147.
 Cornice, Roman, 221.
 Cottingham, casts by, 64, 65.
 Counterpoise, iron, 226.
 Courtenay, Archbishop, 52; the arms of, 51, 54, 57.
 Couters in German armour, 78, 83, 85.
 Crawford, Messrs., 213.
 Creglinger, Peter, effigy of, 74, 77.
 Creke brass, the, 79.
 Crescent motives in silk, 179-81.
 Criol (Keriel), the arms of, 57.
 Crispina, coin of, 233.
 Crocker's plan of Avebury, 108 n. 1, 108 n. 2.
 Croft, archdeacon James, the arms of, 56.
 Crondall church (Hants), bosses in, 47.
 Crossbow, the German, 79.
 Cufic inscriptions on textiles, 173-4, 186.
 Cuisses in German armour, 83, 85, 86.
 Culet, the, in German armour, 86.
 Cunnington, Mr. and Mrs. B. H., their excavations at Avebury, 100, 108, 136.
 Cunobelin, coins of, 214, 217.
 Cymbals, carvings of, 65, 66.

D

D'Abernon brass, the, 79.
 Daniel, Miss Gwladys, 26 n.
 Davey, Dr. Norman, 'Stone Samples from Verulamium', 261.
 Davey, Richard, 9-10.
 Deer, red-, antlers from Avebury, 104, 105 n. 1, 112-13, 115, 119, 120, 121, 125, 126, 127, 136, 148-55; other remains, 158.
 —, roe-, antlers from Avebury, 119, 154; other remains, 158.
 Derby, Henry Lord, his armour, 69.
 De Ros, Lord, 10.
 Deutsch, Matthes, the mark of, 84 n. 3.
 Dighton, John, and the death of the princes, 7.
 Dillon, Viscount, 111 n. 4.
 Diocletian, coins of, 234, 239.
 Dionysius Periegetes on silk, 165.
 Dishes, pottery, 255, 258.
 Ditch, the, at Avebury, 132-4.
 Dog remains from Avebury, 120, 158.
 Domitian, coins of, 227, 229, 231, 237.
 Dorset, Lord, 35.
 Drake, G. C., 14.
 Drevant, the Roman theatre at, 244, 245, 246.
 Druitt, Herbert, 108 n. 3.
 Dulcimer, carving of a, 66.

E

- Eagle motive, the, in art, 188-90.
 Eberstein, Carl von, his armour, 84.
 Edward the Confessor, the arms of, 52, 53; a figure of, 66-7.
 Edward II, seals of, 176, 199.
 Edward III, the arms of, 47; seal of, 171.
 Edward IV, 3, 4; the arms of, 58.
 Edward V, the fate of: historical, 1-15, 26; anatomical, 15-24; summary, 24-5.
 Effigies, German monumental, 69-90; list of military, 91-5.
 Eleanor, Queen, seal of, 185.
 Elizabeth, the Lady, the abduction of, 28, 29, 31.
 Elizabeth Woodville, queen, 3, 5-6.
 England, armour in, compared with German, 70-8; the arms of, on the Canterbury roof-bosses, 53, 57, 58, 59, 61.
 Erbach, 75, 83.
 Estney, prior John, 3.
 Eternalis Fecit, potter's stamp, 237.
 Evreux, the Roman theatre at, 244.
 Exmouth, admiral, the arms of, 56 n. 3.

F

- Farningham (Frenyngham), the arms of, 56.
 Faustina I, coins of, 230, 231, 233, 234, 237.
 Faustina II, coin of, 229, 231, 234.
 Faviell, Lt.-Col. W. F. O., 10 n. 3.
 Fawkes, Guy, 28, 29.
 Fergusson, James, on Avebury, 101, 103.
 Figure bosses in Canterbury Cathedral, 41-50.
 Flakes, flint, 104, 113, 126, 131, 141-5, 147.
 Flint implements: arrowhead, 131 n. 2; cores, 118, 141, 143, 144, 147; flakes, 104, 113, 126, 131, 141-5, 147; hammerstone, 141, 144, 148; knives, 113, 119, 126, 142, 143, 144; miscellaneous, 104, 115, 135, 143-4; saw, 131 n. 2; scrapers, 104, 115, 118, 119, 126, 131 n. 2, 141, 143, 144; sickle (?), 143, 144.
 Fogge, Sir John, the arms of, 58.
 Foliage bosses in Canterbury Cathedral, 41-50.
 Forrest, Miles, and the death of the princes, 7.
 Fossils from Avebury, 116, 160-1.
 Fowl remains from Avebury, 159.
 Fox remains from Avebury, 159.
 France, the arms of, on the Canterbury roof-bosses, 47, 51, 52, 53, 57, 58, 59, 61.
 Frederick II, 84 n. 2.
 Frenyngham (Farningham), the arms of, 56.
 Freyberg, von, the armoury of the family of, 82.
 Friedrich der Siegreiche, his armour, 86.

- Frog remains from Avebury, 159.
 Fulton, Mr., on a cufic inscription, 174.
 Fürstenwalde helmet, the, 80.

G

- Gairdner, Dr., 2, 5, 6.
 Gallienus, coins of, 233, 234, 236, 237.
 Gauntlets in German armour, 77, 79, 83, 84, 85, 90.
 George III, coin of, 114 n. 1.
 Germany, the plate armour of, in the 14th and 15th centuries, 69-97.
 Gifford, Sir John, brass of, 76.
 Giuseppi, M. S., 33.
 Glass intaglio, 259; pin, 261.
 Godfrey de Bouillon, his statue, 70.
 Goldstone, prior, his rebus, 52, 60.
 Gordian III, coins of, 235, 237.
 Gordon, John, dean of Salisbury, 33.
 Gothic armour, German, 69-90, 94-5; carving, 45.
 Gray, H. St. George, 'The Avebury Excavations, 1908-1922', 99-162.
 Gray, Mrs. H. St. George, 106, 113 n. 1, 145.
 Greaves in German armour, 79, 84, 86.
 Griffin, Ralph, 41, 53 n. 3, 57.
 Griffin, the, in art and symbolism, 176-9, 198, 200.
 Grönewalt, Hans, armourer, 85 n. 2.
 Gunpowder plot, a picture commemorative of the, 27-39.
 Günther XXI von Schwarzburg, effigy of, 74, 77-8.
 Günther XXV von Schwarzburg, his armour, 77, 78.

H

- Habilis F, potter's stamp, 230.
 Hadrian, coins of, 214, 217, 222, 225, 228, 229, 230, 231, 234.
 Hammerstone, flint, 141, 144, 148.
 Harrison, Archdeacon, the arms of, 57.
 Hauberk, the German, 70, 71, 76, 78, 81, 90.
 Hawthorn charcoal, 130, 159, 160.
 Haydocke, Richard, picture attributed to, 27; shown to be the donor of the picture, 32-5; his confession, 37-9.
 Hazel charcoal, 130, 159, 160.
 Heart-shaped decoration, 186-7.
 Helm, the German, 70, 74, 75, 90.
 Henderson, H. L., 37.
 Henry II, seal of, 182.
 Henry III, a figure of, 66-7.
 Henry V, the arms of, 53, 55.
 Henry VII, 2, 7; the arms of, 60.
 Henry, Prince of Wales, 30.

Heraldic bosses in Canterbury Cathedral, 47, 50-61.
 Herlen, Friedrich, painting by, 88.
 Hessen, the Laudgrafen von, their monuments, 70.
 Hilton, effigy of a, 71 n. 1.
 Hindson, Alice, 'Technical Notes on the Canterbury Seal Bags', 206-11.
 Hoare's plan of Avebury, 108 n. 3.
 Hochenberger, Wilhelm, armourer, 86.
 Hofer, Dietrich, effigy of, 80.
 Hohenberg Knight, the, 78.
 Hohenaschau, armour from, 82, 84.
 Hohenrechberg, Ulrich von, effigy of, 88.
 Holand, Margaret, monument of, 60.
 Hopwood, Dr., 20 n.
 Hornbeam charcoal, 159-60.
 Horse in foliage motive, the, 182, 183-4.
 Horse remains from Avebury, 157.
 Horse-chestnut charcoal, 130, 159, 160.
 Horseshoe from Avebury, 111 n. 3.
 Host, carving of the, 64, 65.
 Hubbocke, William, 12-13.
 Human remains from Avebury, 113, 115, 119, 126 n., 135, 140, 142, 145-8.
Hunskugel, the German, 75, 80.
 Hunt, Thomas, pipe-maker, 114 n. 1.
 Hyde, Thomas, 33.

I

Ingelheim, Philip von, effigy of, 80.
Inocens, the armour mark, 84 n. 3.
Inoceramus labiatus fossils, 116.
 Innsbruck, the armour platers of, 69.
 Intaglio, glass, 259.
 Iron objects: arrowhead, 111; cleat, 119; counterpoise, 226; horseshoe, 111 n. 3; knife, 111 n. 3.
 Iron pyrites from Avebury, 120.
 Italian armour in relation to German, 69-89.

J

Jackson, Dr. Wilfrid, 106.
 James I and the gunpowder plot, 27-39.
 James, Miss M. V. G., 136 n. 1.
 Jenner, Lieut.-Col. L. C. D., 106, 127, 128.
 Jet bead, 259.
 Jugs, pottery, 217, 225, 226, 230, 255.
 Jupon, the, in German armour, 77, 78.
 Juvenal on silk, 168.

K

Kaufhaus (Mainz), reliefs in the, 74.
 Keiller, A., his excavations at Avebury, 100.
 Kemp, Archbishop, the arms of, 59.

Kennard, A. S., and B. B. Woodward, 'Report on the Non-Marine Mollusca, Avebury', 106, 160-1.
 Kennet Avenue, the, Avebury, 100, 109, 117, 127, 136, 161 n.
 Kent, the Fair Maid of, 60, 61.
 Kenyon, Miss Kathleen M., 'The Roman Theatre at Verulamium, St. Albans', 213-61.
 Keriell (Criol), the arms of, 57.
 King, Rev. Bryan, on Avebury, 100 n. 1, 101.
Klappvisier, the German, 75, 90.
 Knapp-Fisher, Sir Edward, 14.
 Knevinton, Ralph de, the brass of, 71 n. 1.
 Knight, John, 8, 10.
 Knives, flint, 113, 119, 126, 142, 143, 144; iron, 111 n. 3.
 Kornburg family, tomb of the, 76.

L

Laking, Sir Guy, on armour, 69, 74, 80, 82, 85, 90.
 Lamb and cross, carvings of, 45, 47.
 Lando, Count, 71.
 Landschaden, Hannel von, effigy of, 78.
 Landschaden, Ulrich, effigy of, 76.
 Landshut, the armour platers of, 69, 85.
 Lavabo bowl, carving of a, 64, 65.
 Lawes, H., 106.
 Lawson, A. H., 132, 134.
 Le Despencer, bishop Hugh, the arms of, 55-6.
 Leeds, E. T., 15 n.
 Leg-harness in German armour, 77, 79.
 Legg, L. G. Wickham, 'On a Picture commemorative of the Gunpowder Plot, recently discovered at New College, Oxford', 27-39.
 Leslie, Thomas, his excavations at Avebury, 103-5, 110.
 Lethaby, Prof. W. R., on a choir of angels in Westminster Abbey, 63, 64; on two figures there, 67.
 Lichtenberg castle, 71.
 Lichtenperg, Theodorich von, effigy of, 77.
 Lillebonne, the Roman theatre at, 244.
 Lindsay, Philip, 2 n. 6.
 Lion motive, a, 203.
lisières d'arrêt in German armour, 81, 86.
 Long, William, on Avebury, 103.
 Longstone Cove, near Avebury, 101, 102, 108.
 Lowe, R. Grove, on the theatre at Verulamium, 213.
 Lowther, A. W. G., his work at Verulamium, 213-14.
 Lucas, Rev. C., on Avebury, 101.
 Lucca silk, 201.
 Lukis, Rev. W. C., on Avebury, 101, 103, 108 n. 1, 109 n. 2.

Lush, John, 106.
 Lyell, A. H., 159.
 Lyversberger Passion, the Master of the, 88.

M

Maby, J. Cecil, 'Charcoals from the Avebury Excavations', 106, 130, 159-60.
 Mancini, Dominic, on the fate of the princes, 13-14.
 Mann, J. G., 'Notes on the Evolution of Plate Armour in Germany in the Fourteenth and Fifteenth Century', 69-97.
 Manning, W. Westley, 5.
 Mantua, Francesco, marquess of, 88.
 Marburg, church of St. Elizabeth, military tombs in, 84.
 Marcus Aurelius; coins of, 231, 233, 236.
 Margaret, Princess, 4.
 Markham, Sir Clements, 2.
 Marlow, canon Michael, the arms of, 56.
 Marshall, Joshua, 11.
 Mary, the virgin, painting of, 79.
 Mass, vessels of the, representations of, 64-6.
 Ma-tuan-lin on silk, 167.
 Maurus, the merchant family of, 169.
 Medieval remains: arrowhead, 111; miscellaneous, 125; pottery, 103, 105, 112, 114, 117 n., 128, 132.
 Mercati, Mgr, 204.
 Meux, Sir Henry B., 103.
 Milanese armour in Germany, 86-8.
 Millyng, abbot Thomas, 3.
 Minims, hoard of, 236.
 Missaglia armour, 86.
 Missal, carving of a, 64.
 Mittens in German armour, 70, 79.
 Molasch, prior Willms, carving of, 48-9.
 Mole remains from Avebury, 159.
 Mollusca, non-marine, from Avebury, 160-1.
 Monteagle, Lord, the letter to, 28-9, 31.
 Monumental effigies, German, 69-90; list of military, 91-5.
 Moore, canon George, the arms of, 54.
 Moore, canon Robert, the arms of, 56.
 Moosburg, the castle of, 80.
 More, Sir Thomas, on the fate of the princes, 5, 6, 13, 24, 26.
 Mortaria, pottery, 217, 225, 230, 235, 240, 255, 258.
 Morton, Archbishop, the arms of, 60.
 Morton, Cardinal, 6.
 Moynihan, Lord, 14.
 Multscher, Hans, the school of, 79.
 Musical instruments, representations of, 64-6.
 Myres, Prof. J. L., 37.

N

Nāga, legend of the rescue of a, 194-6.
 Nail-cleaners, bronze, 259.
 Nasal, the, in German armour, 71, 75.
 Neale and Brayley on a choir of angels in Westminster Abbey, 63-6; on two figures there, 67.
 Nelson, Earl, the arms of, 54, 56 n. 3.
 Neolithic B pottery, 112, 120, 126, 131, 135, 136-40, 147, 162.
 Nero, coin of, 233.
 Nevill family, the arms of the, 58, 59.
 New College, Oxford, a picture commemorative of the gunpowder plot in, 27-39.
 New Forest ware from Avebury, 119.
 Newton, E. T., on animal remains from Avebury, 158, 159.
 Norfolk, Thomas Mowbray, duke of, 69.
 Norman pottery, 103, 105, 112, 132.
 Norris, canon Charles, the arms of, 54.
 Norris, Dr. W. Foxley, dean of Westminster, 1-2, 14.
 Northcroft, Dr. George, 16, 18, 24.
 Notke, Bernt, figure by, 82 n. 2.
 Nürnberg, the armour platers of, 69, 80-1, 85, 86.

O

'Obelisk', the, from Avebury, 109.
 Oberdorf, Wilhelm von, effigy of, 80.
 Oldham, J. B., 4 n. 3.
 O'Neil, B. H. St. J., on the coins from Verulamium, 214.
 Oolite coping-stones, 221, 261.
 Order of the Swan, the, 84.
 Otto IV von Henneberg, figure of, 83.
 Ox remains from Avebury, 115-16, 121, 148, 157-8; from Verulamium, 240.
 Oxney, prior John, the rebus of, 52, 60.

P

Pacher, Michael, artist, 82.
 Painting commemorative of the gunpowder plot, 27-39.
 Paintings, wall-, armour shown in, 70-1.
 Palermo silk, 176.
 Palette, stone, 259.
 Parler, Peter, workshop of, 76.
 Parsons, E. A., 106.
 Passmore, A. D., on Avebury, 131 n. 2, 132.
 Paten, carving of a, 64.
 Patercli, potter's stamp, 217.
 Paul, Tom, 106.
 Pauldrons in German armour, 83, 84, 85, 86, 88.

Pausanias on silk, 166-7.
 Pavises, German, 78, 90.
 Peacock, the, in art and symbolism, 171-3, 182-3, 200.
 Peak-Garland, J., 106, 108 n. 3.
 Pebbles from Avebury, 116-17, 121.
 Pellew, canon George, the arms of, 56.
 Percivall, John, printing attributed to, 32.
 Percy family, the arms of the, 53, 57.
 Percy, Henry, the arms of, 53.
 Percy, canon Hugh, the arms of, 53, 55.
 Percy, Sir Ralph, the arms of, 53.
 Peterborough ware from Avebury, 112, 120, 131, 136-40.
 Philip I, coin of, 236.
 Pienzenau, Otto von, effigy of, 77.
 Picks, antler, from Avebury, 104, 105 n. 1, 112-13, 115, 121, 125, 126, 148-55.
 Pig remains from Avebury, 158.
 Piggott, Stuart, 'The Pottery from the Avebury Excavations', 106, 120, 136-41.
 Pins, bone, 127, 131, 259, 261; bronze, 261; glass, 261.
 Pipe, clay tobacco-, 114 n. 1; water-, 216.
 Pipe, triple, carving of a, 66.
 Placate, the, in German armour, 88.
 Plano-convex flake knives, 142.
 Plattner, the German, 74.
 Pliny on silk, 166.
 Poleyns in German armour, 84.
 Pollak, Jan, painting by, 85.
 Porphyrite pebble, 117.
 Postumus, coin of, 237.
 Pots, pottery, 112 n. 1, 114 n. 2, 115 n., 117 n., 119 n. 2, 233.
 Potters' stamps, Roman, 217, 221, 229, 237.
 Pottery: beakers, 126, 217, 226, 255, 258; bowls, 138, 217, 225, 226, 229, 230, 255, 258; miscellaneous, 102, 103, 104, 105, 112, 114, 115, 117 n., 119 n., 120, 126, 128, 131, 132, 135, 136-41, 147, 214, 217, 221, 225-40, 253-8; dishes, 255, 258; jugs, 217, 225, 226, 230, 255; mortaria, 217, 225, 230, 235, 240, 255, 258; pots, 112 n. 1, 114 n. 2, 115 n., 117 n., 119 n. 2, 233; saucer, 119; tile, 112; vessels, 112, 115 n.
 —: beaker, 135, 136-8; Bronze Age, 115; medieval, 112, 114, 117 n., 128, 132; neolithic B, 112, 120, 126, 131, 135, 136-40, 147; New Forest, 119; Norman, 103, 105, 112, 132; Peterborough, 112, 120, 131, 136-40; Roman, 119, 214, 217, 221, 225-40, 253-8; Romano-British, 103, 105, 112, 115, 117 n., 126, 136.
 Prankh helm, the, 76.

Princes in the Tower, the fate of the: historical, 1-15, 26; anatomical, 15-24; summary, 24-5.
 Priscian on silk, 165.
 Propertius on silk, 168.
 Pryce, Dr. T. Davies, on the pottery from Verulamium, 214, 253 n., 254.
 Psalter, carving of a, 65.

R

Rakes, antler, from Avebury, 121, 127, 136, 154, 155.
 Ramsay, Sir James, 6, 7.
 Rauchbein, Johann, his armour, 86.
 Reid, Clement, on various finds at Avebury, 130, 138 n., 140 n., 141 n. 1, 159.
 Reliquaries, silk in, 165.
 Rerebraces in German armour, 77, 79, 83.
Rhynchonella Cuvieri fossils, 116, 121.
 Richard I, seals of, 175.
 Richard III, and the death of the princes, 2-10, 19, 20; the arms of, 58.
 Richard, duke of York, the fate of: historical, 1-15, 26; anatomical, 15-24; summary, 24-5.
 Richardson, Mrs., 32.
 Riederer, Caspar, armourer, 85.
 Riemenschneider, Tilman, sculptor, 82.
 Rings, bronze, 126, 259.
 'Ring-stone', the, from Avebury, 109.
 Rivets in German armour, 85, 86.
 Robinson, Miss Gertrude, and Miss H. Urquhart, 'Seal Bags in the Treasury of the Cathedral Church of Canterbury', 163-211.
 Rochester, the arms of, 52.
 Roman: bead, 259; beakers, 217, 226, 255, 258; bobbin, 259; bowls, 217, 225, 226, 229, 230, 255, 258; bracelets, 259; brooch, 259; buckle, 259; capital, 222; cleat, 119; coins, 221-41, 254; cornice, 221; counterpoise, 226; dishes, 255, 258; fibula, 119, 155-7; intaglio, 259; jugs, 217, 225, 226, 230, 255; miscellaneous, 125; mortaria, 217, 225, 230, 235, 240, 255, 258; nail-cleaners, 259; palette, 259; pins, 259, 261; pipe, water-, 216; pot, 119 n. 2, 233; potters' stamps, 217, 221, 229, 237; rings, 259; saucer, 119; theatre at Verulamium, 213-61; tiles, 261.
 Romano-British pottery, 103, 105, 112, 115, 117 n., 126, 136; whetstone, 126.
 Roncolo castle (Bolzano), 71.
 Roof-bosses in Canterbury Cathedral, the, 41-61.
 Rukh-bird, the, 191.
 Rump-plate, the, in German armour, 86.
 Russell, John, bishop of Rochester, the arms of, 52, 60.

Russell, canon John, the arms of, 53, 55.
Rutherston, Albert, 27.

S

Sabatons in German armour, 79, 84, 86.
Sabbionara castle (Avio), military pictures in, 70-1, 78.
Sachsenhausen, Rudolf von, effigy of, 75 n. 1, 77.
St. Edmund, the arms of, 52, 53.
St. Florian, figure of, 82 n. 2, 88.
St. George, the arms of, 60; representations of, 79, 80, 82 n. 2, 83, 84, 88.
St. Oswald, painting of, 80.
St. Peter's, Sandwich, effigy in, 71 n. 1.
St. Stephen's church (Vienna), sculptures in, 76.
Sallet, the, in German armour, 80, 81-2, 83, 84, 85, 86.
Salter, Dr. H. E., 33 n.
Samson and the lion (?), carving of, 48.
Sanctuary, the, near Avebury, 100, 136.
Sandars, Horace W., on Avebury, 116 n. 1, 149.
Sandford on the discovery of the princes' bones, 8, 10, 11, 14.
Sandstone pebble, 121; whetstone, 126.
Sarsen stones, the, at Avebury, 99, 101, 102, 103, 104, 110, 111, 161-2.
Saucer, pottery, 119.
Saw, flint, 131 n. 2.
Schenck von Erbach, Conrad, effigy of, 75 n. 2.
—, Georg, statue of, 83.
—, Hans, statue of, 83.
Schreiber, Heinrich, armourer, 86 n. 1.
Schwarzburg, Günther von, effigies of, 74, 77, 78.
Scofield, Miss, 3.
Scott of Scott's Hall, the arms of, 60.
Scrapers, flint, 104, 115, 118, 119, 126, 131 n. 2, 141, 143, 144.
Scrope, Lady, 3.
Seal bags in Canterbury Cathedral, 163-211; elsewhere, 164.
Seneca on silk, 165.
Sens Cathedral, bosses in, 43.
Septimius Severus, coin of, 231.
Septvans, the arms of, 57.
Seres, the, and silk, 165-7.
Severus Alexander, coins of, 233, 234.
Sewell, Warden, 27.
Sheep remains from Avebury, 147, 158; from Verulamium, 240.
Shields, German, 78, 79, 90.
Shirt, the, in German armour, 79.
Shovels, bone, from Avebury, 113 n. 2, 115-16, 136.
Sicilian silk, 175, 190, 198, 200.
Sickle (?), flint, 143, 144.

Side-plates in German armour, 86.
Siebenbürger, Valentin, armourer, 86.
Silbury Hill, Avebury, 100.
Silius Italicus on silk, 165.
Silk, ancient, its rarity, 163-4; classical opinions regarding, 165-7; Chinese writers on, 167-9; the distribution of, 169-70; the designs on, 170-1; description of specimens from Canterbury Cathedral, 171-205; technical notes on, 206-11.
Skirt, the, in German armour, 77, 79, 80, 81, 84.
Sleeves in German armour, 71, 77, 78.
Smith, Rev. A. C., on Avebury, 101, 103, 108, 109 n. 3, 149 n.
Sollerets in German armour, 82.
Somerset, John Beaufort, earl of, effigy of, 60.
Spanish silk, 174-5.
Spurs in German armour, 79, 82.
Stadler, Johann, 86.
Stafford, Archbishop, the arms of, 60.
Stafford, Lord, the arms of, 53.
Stag's horn from Avebury, 102.
Stanfield, J. A., on the pottery from Verulamium, 253 n., 254.
Stapleton, Sir Miles de, brass of, 77 n. 5.
Stawell effigy, the, 75 n. 1.
Stein, Sir Aurel, 204.
Stettenberg, Peter von, effigy of, 81.
Stöcklein, Dr., 84 n. 3.
Stone, Benjamin, 32.
Stone circles, the, 105.
Strabo on silk, 165, 168.
Stubbs, Bishop, 1.
Stukeley on Avebury, 99, 100, 101, 103, 108, 109, 117.
Sturmhaube, the German, 75.
Sudbury, Archbishop, 52; the arms of, 51, 54, 55, 56.
Sumner, archbishop John, the arms of, 57.
Sumner, canon Charles Richard, the arms of, 53.
Sun-dial, carving of a, 64, 66.
Surcoat, the, in German armour, 70, 76.
Surtees, canon Matthew, the arms of, 53, 55.
Sutton, archbishop Charles Manners, the arms of, 55.
Swinborne, Sir Thomas, brass of, 78.
Sword, the, in German armour, 79.

T

Tanciis, Thomas de, armourer, 87.
Tanner, Lawrence E., and Prof. William Wright, 'Recent Investigations regarding the Fate of the Princes in the Tower', 1-26.
—, C. J. P. Cave and, 'A Thirteenth-century Choir of Angels in the North Transept of Westminster

- Abbey and the Adjacent Figures of Two Kings', 63-7.
 Tassels in German armour, 78.
 Tassets in German armour, 81, 83, 84, 86, 88.
tegulum from Avebury, 112.
 Tetricus I, coins of, 234, 237.
 Tetricus II, coins of, 234, 235, 237.
 Theatre, the Roman, at Verulamium, 213-61.
 Theodosius, House of, coins of the, 240, 254.
 Thierstein, Rudolf von, effigy of, 70.
 Thomas, Dr., 194.
 Thomas, Dr. H. H., on a pebble from Avebury, 116-17.
 Thordeman, Dr. B., his armour terminology, 76 n. 3.
 Tiles, pottery, 112; stone, 261.
 Titus, coins of, 229, 231.
 Toad remains from Avebury, 159.
 Tower of London, the fate of the princes in the, 1-26.
 Trajan, coins of, 221, 224, 226, 229, 234.
 Trajan Decius, coin of, 236.
 Trebonianus Gallus, coin of, 237.
 Tree motives in art, 192, 196-7.
 Tree of Life, the, as a symbol, 174.
 Treppin, E. C., his excavations at Avebury, 103.
 T'sang, his explorations, 168-9.
 Tudor, Sir Gronw ap, effigy of, 79.
 Twining, Thomas, on Avebury, 101.
 Tyrell, Sir James, 6-7.
 Tyrol, the archdukes of, their armour, 84, 85.

U

- Urquhart, Miss H., Miss Gertrude Robinson and, 'Seal Bags in the Treasury of the Cathedral Church of Canterbury', 163-211.
 Utine (Whiting), Thomas, 5.

V

- Valentinian, House of, coins of the, 240.
 Valerian II, coin of, 235.
 Vallance, Aymer, 14.
 Valognes, the Roman theatre at, 244.
 Vambraces in German armour, 77, 78, 79, 83, 86.
 Verulam, Lord and Lady, 213.
 Verulamium, the Roman theatre at, 213-61; description of the theatre: site of the theatre, 214; summary of periods, 215; period I, 215-22; period II, 222-8; period III, 228-31; period III a, 231-2; period IV, 232-9; period IV a, 239; decay of the theatre, 239-41; historical summary, 241; comparison of the theatre with other examples, 242-7; bibliographical list of Roman theatres, 247-53; Samian pottery, 253-5;

- coarse pottery, 254-8; objects of metal, bone, etc., 259-61; stone samples, 261.
 Vervelles in German armour, 74.
 Vespasian, coin of, 230.
 Vessels, pottery, 112, 115 n.
 Vestment, a, in Canterbury Cathedral, 201 n. 2.
 Vicili, potter's stamp, 229.
 Victorinus, coins of, 234, 237.
 Vieil-Évreux, the Roman theatre at, 244.
 Vieux, the Roman theatre of, 244.
 Viol, bass, carving of a, 66.
 Virgil on silk, 165, 166.
 Vischer, Peter, figures by, 82, 83.
 Visor, the, in German armour, 74-5, 79, 80, 82, 83, 90.
 Vitruvius on the Roman theatre, 242-4, 247.
 Volbach, Dr., 205.

W

- Wace, Prof., on silk, 163 n. 1, 166 n. 2, 174.
 Waldburg, Wilhelm, the tomb of, 83.
 Wall-paintings, armour shown in, 70-1.
 Walpole, Horace, 2.
 War-hat, the German, 75, 79, 80.
 Warbeck, Perkin, 4, 5.
 Ward, Rev. J. G., 106.
 Wareham, Archbishop, the arms of, 60.
 Warp and weft in silk, 206-11.
 Warwick, Thomas Beauchamp, earl of, the arms of, 54.
 Wei-liu, the Chronicles of, on silk, 167.
 Weinberg, Conrad von, effigy of, 79-80.
 Wellfit, canon William, 54.
 Werdegg, the castle of, 80.
 Werdt, Ulrich de, his tomb, 76.
 West Kennet long-barrow, the, 100, 136.
 Westminster Abbey, the bones of the princes in, 1-26; the birth of Edward V in, 3; a choir of angels in, 63-6; figures of two kings in, 66-7.
 Wheeler, Dr. R. E. M., 213.
 Wheeler, Mrs. R. E. M., on the minims from Verulamium, 214, 236.
 Whetstone from Avebury, 126.
 Wildberg, Schloss, 81.
 Willement on the Canterbury heraldic roof-bosses, 41, 51-60.
 William III, coin of, 111 n. 2.
 William IV, coin of, 131 n. 1.
 William the Englishman, his work in Canterbury Cathedral, 44, 46.
 William of Sens, 43, 44.
 Willis on Canterbury Cathedral, 42, 51.

- Wiltshire Archaeological and Natural History Society, 103, 107; excavations by the, 101, 102.
 Windmill Hill, near Avebury, 101-61.
 Winsternach, Count, 86.
 Witz, Conrad, painting by, 79.
 Witzleben, Theodrich von, effigy of, 77.
 Wodnisbergh, prior Johns, carving of, 48-9.
 Wohlgemuth, Michael, drawing by, 82.
 Wolfskel, Eberhard, effigy of, 75 *n.* 1.
 Woodward, B. B., A. S. Kennard and, 'Report on the Non-Marine Mollusca, Avebury', 106, 160-1.
 Worms, Wilhelm von, armourer, 86.
 Wren, Sir Christopher, 11.
- Wright, Prof. William, on the human remains from Avebury, 106, 146, 148.
 —, Lawrence E. Tanner and, 'Recent Investigations regarding the Fate of the Princes in the Tower', 1-26.
 Wu-ti, the emperor, 168-9.
- Y
- Yew charcoal, 159.
 Yorke, E. C., 37.
 Yorkist arms, 52.
- Z
- Zeitblom, Bartholomäus, artist, 82.
 Zodiac, the signs of the, 28.

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52

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