seen, in their most extreme form, on the cross-shaft from St. Bees[12] and, in a regular and restrained form, on one of the Lancaster carvings.[13]

The Canterbury plaque cannot be exactly paralleled in English metal-work of the 10th century, but it is in many respects very close in design to the series of bronzes quoted above. Like the York strap-end, it has its roots in the art of Scandinavia. The basic design is very similar to that on a gold filigree mount from a grave at Lackalänge, Skåne, Sweden,[14] which only differs in that it has an encircling, interlacing ring through the whole pattern. A gold Borre object of this sort may well have provided some sort of prototype for the Canterbury disc.

The Canterbury piece belongs to a growing group of 10th-century finds from that city. I have mentioned these finds elsewhere[15] and suggested that they may be associated with the sack of Canterbury in 1011. The large number of well-known objects of a similar date from York naturally reflects the very troubled history of that Viking town in the last few centuries before the Norman conquest. DAVID M. WILSON

TWO LEVELS OF THE MERE AT KENILWORTH CASTLE, WARWICKSHIRE (PLS. XVIII–XIX ; FIGS. 30–31)

The artificial lake known as the mere that lay to the west of Kenilworth Castle in medieval times was described by a Tudor surveyor as half a mile long and 500 ft. wide.[16] It was therefore one of the largest expanses of water in medieval England that was artificially created for defence. It was the highest of a number of ponds, formed in the valley from the streams entering from the west, that served the castle and the abbey lower downstream. Numerous traces survive on the ground of these waterworks, but the abbey pond, flooded annually for winter skating, is the only part of these elaborate works that can still be said to be in use.

The accompanying sketch-map (FIG. 30) shows the castle proper on a bluff on the N. side of the valley linked by a massive causeway, known as the tiltyard, to an area of irregular shape defended by a substantial bank and ditch, known as the Brays, on the south. The 'tiltyard' was in fact the dam that ponded back the water that formed the mere on its W. side. Both castle and abbey (at first, 'priory') were founded by Geoffrey de Clinton in the reign of Henry I. In his foundation-charter Geoffrey excluded from the grant the land he was using for his park and castle,[17] but as an early confirmation-charter by Geoffrey to the abbey allowed the monks to fish 'with boat and nets' in his pool on Thursdays,[18] it is likely that the mere was created at the same time as the castle. Indeed the conformation of the valley, a narrow gap with high ground jutting out on either side, perhaps suggested the idea of creating the mere and determined the site of the castle at the same time.

In medieval times entry to the castle was through the E. side of the Brays, across a bridge at the S. end of the tiltyard, along the causeway and so through the gate known as Mortimer's Tower at the N. end into the castle. Late in the 16th century the earl of Leicester built the existing gatehouse at the N. end of the castle 'where formerly having been the backside of the castle, he made the Front'.[19] After the Civil War Colonel Hawkesworth as part of the 'slighting' of the castle made a great breach in the tiltyard

[12] Collingwood, *op. cit.* in note 10, fig. 165.

[13] *Ibid.*, fig. 171. [14] Wilson and Klindt-Jensen, *op. cit.* in note 2, pl. xxix, *j*.

[15] D. M. Wilson, 'The King's School, Canterbury, disc brooch,' *Med. Archaeol.*, IV (1960), 28.

[16] SC. 12/16/22 at the P.R.O.

[17] Sir W. Dugdale, *Monasticon Anglicanum* (1846 ed.), pp. 220–23. The foundation-charter speaks of castle and park, but a royal confirmation-charter by Henry I speaks of castle, burgus, fish pool (*vivarium*) and park.

[18] Sir W. Dugdale, *The Antiquities of Warwickshire* (2 ed., 1730) I, 238b. The first edition appeared in 1656 and Dugdale appears to have written the text in *c.* 1640 before the Parliamentary 'slighting'.

[19] *Ibid.*, p. 249a.

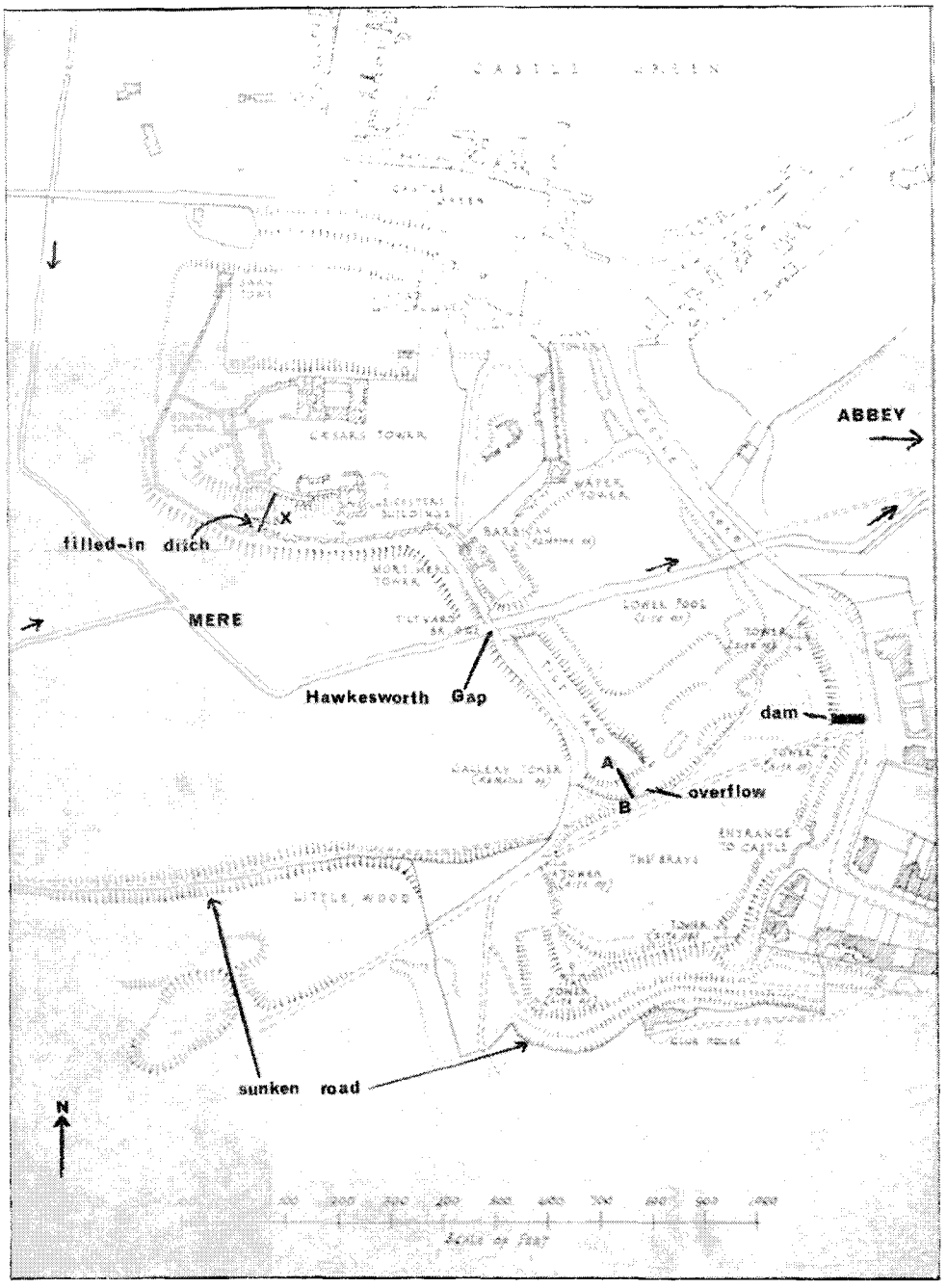

FIG. 30

KENILWORTH CASTLE, WARWS. (pp. 156, 158 ff.)

Sketch-map showing sites of recent discoveries. X marks the section cut by P. A. Rahtz.

causeway to prevent the re-formation of the mere. The stream which provided the water for the mere now flows through the 'Hawkesworth Gap'.

For 300 years or more, therefore, the main entry to the castle has been from the N. end. The congestion of parked vehicles at this point has recently become a matter of concern to the Ministry of Public Building and Works which now maintains the castle. It was accordingly decided in 1962 to use the Brays as a car-park to ease this congestion, while more recently it was further decided to restore some part of the medieval method of access by spanning the gap at the S. end of the tiltyard with a modern bridge and filling in the 'Hawkesworth Gap'. These works, which are still in progress, have revealed masonry structures at two points which throw some light on the medieval water controls.

The Brays (FIG. 30) is a curious earthwork, about 200 yds. long internally, forming a sort of crescent around the S. end of the tiltyard. The back has no bank but the rest of the crescent consists of a deep ditch with a large bank on its inside. At its angles and at other points a number of massive earthen bastions project from the bank. They are evidently emplacements, not perhaps for towers looking outwards as the O.S. sheet marks them, but rather for tents or pavilions looking inwards for use during tournaments.[20] The lack of defences of any kind at the back and absence of stone except for a not very strong gatehouse leaves the impression that the Brays were not a serious defensive work.[21] On the south there appears to be a smaller outer ditch but this is a medieval sunken road, buried by the modern road on the W. side of the Brays, but emerging again running west along the S. side of the mere. The present farm road passes through a modern break in the bank just after it leaves the main road on the E. side, where the first discovery of masonry was made.

The bank, which was seen in section at this cutting, was of simple dump construction with no evidence of alteration or of date. The projection from the bank on the S. side of the road contained no masonry of any kind. The masonry on the N. side consisted of a massive wall 14 ft. thick, built in steps down the side of the bank and ditch and passing transversely across the ditch (PL. XIX, A). Unfortunately its E. end could not be fully explored because it was under the main road, while its SE. corner was inaccessible under the farm road. At 10 ft. out from the bank both sides rose in a battered plinth, lower on the S. than on the N. side, but too little of the ashlar remains to determine the width of the original top. A modern drain has cut a large piece out of the E. side of the masonry, but on the W. side the remains of a funnel-shaped aperture, outlet hole and shutter chamber of a sluice remain. On the N. side, although mainly core, the structure is impressive, standing 12–15 ft. high and over 50 ft. long. At its base on the rock of the ditch the remains of two buttresses, one (a pilaster) unaltered and one rebuilt, are visible.

The diagonal tooling on the stones and the pilaster buttresses suggest an early date, perhaps early 13th century. The workmanship is of high quality. The general purpose of the structure is clear, although the details are enigmatic. The ground to the north drops 20 ft. or so to a ford, and, as the Brays moat was fed from the mere at its NW. corner, the structure was evidently a dam holding back the water in the moat at the edge of the high ground. The bottom of the funnel outlet in the sluice is 5·7 ft. below the overflow level of the mere at the gallery tower.

The 'tiltyard' (the name is not used before Elizabethan times) is a massive causeway about 500 ft. long and 50 ft. wide across the top which was protected by a crenellated wall along both sides, and had at its S. end a building which Dugdale speaks of as 'the Floud gate, or Gallery Tower, standing at one end of the Tiltyard, in which was a

[20] *Ibid.*, p. 247b. The Concourse of the Round Table presided over by Roger Mortimer in 1279 was presumably the most elaborate of many such tournaments held at the castle.

[21] The name 'brays' is used indiscriminately in the 15th-century documents as a corruption of 'bays', the medieval name for a series of pools of water ponded back down a valley. The use is the same as *bays* in a Gothic arcade. See *Archaeol. J.*, CI (1944), 91–107.

spacious and noble room for Ladies to see the exercises of Tilting and Barriers'.[22] The medieval gatehouse was evidently entirely redesigned by the earl of Leicester, but only very fragmentary remains of this building survive. In order to decide where the modern bridge ought to be put evidence was sought in January and February, 1965, for the site of the medieval bridge. More evidence came to light about the water controls at this point than about the bridge itself. After two sections had been dug and bridged with wooden planks a mechanical shovel was brought to the site to remove post-Tudor detritus. Most of the masonry discovered will therefore be visible to the public as they pass over the bridge on to the tiltyard.

The accompanying section (FIG. 31) on the site of the bridge will explain what was discovered. The tiltyard surface was 20 ft. above the bottom of the stream channel.

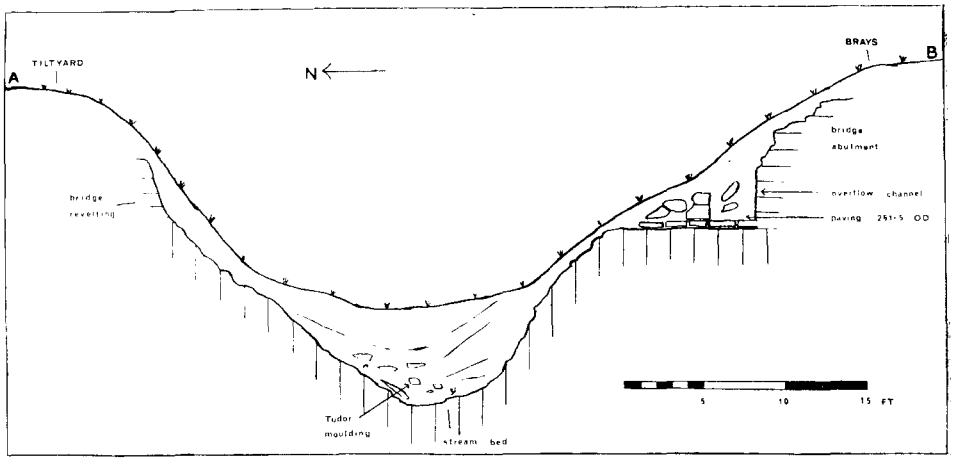

FIG. 31
KENILWORTH CASTLE, WARWS.
N.–S. section through gap between Brays and tiltyard

When the mere was created, a narrow channel at its SE. corner served as an outlet. The gradient was steep and there must have been a sort of torrent running along this channel. The bed of the stream was free from normal silting and indeed only contained large stones. Near the bottom were medieval and Tudor moulded stones from the collapse or 'slighting' of the adjoining gallery tower. The stream channel, cut through the natural rock, occupied only about 25 ft. of the 40-ft. width of the gap. On the S. side the top of the natural rock had been carefully paved with closely-fitting stones forming a sort of terrace or platform extending for 40 ft. along the Brays side of the gap. The S. side of the platform rose as a vertical face of masonry (the ashlar face has of course gone) to form the abutment of the bridge. At its W. end there was a deep vertical slot in the masonry wall and a horizontal groove on the platform. A channel $2\frac{3}{4}$ ft. wide was formed by another wall-face on the platform. The W. side of the wall had a battered plinth facing the mere (PL. XVIII, A–B). As this was built over the horizontal groove, it was clear that the present construction was not in its original form. On the gallery tower side half of a D-shaped tower projected from the SW. corner. Further east a width of some 8 ft. of the made-up ground above the natural rock had been revetted, presumably below the bridge. At the E. end the stream opened out into a wide area bounded by masonry both on the N. side (the SE. end of the gallery tower) and on the W. (the E. end of the platform).

[22] Dugdale, *op. cit.* in note 18, p. 249a.

The very fragmentary condition of the remains is perhaps better explained as due to systematic demolition when the causeway was breached rather than to normal stone robbing.[23] It is clear from the grooves that wood, as well as masonry, played a part in the construction. Although the details are enigmatic, the general purpose of the structure is reasonably clear. The platform was an overflow outlet for the mere, which had two levels, a low one when its outlet was the stream bed and one 12 ft. higher when its outlet was over the platform. In order to raise the level the stream must have been closed with a one- or two-leaf lock-gate, no doubt the flood gate referred to by Dugdale. Its position can no longer be determined, but it was presumably east of the bridge. In a siege the arrangement could have been made permanent by filling in the stream behind the gate with rock and soil.

Because the stream bed is rising to the west, it is not clear how much the mere level would have been raised by the gate, but even a vertical rise of 6 ft. in the surface must have increased its horizontal area very considerably. Two conjectural plans have recently been made of the mere.[24] Its length can to some extent be determined, since the canal or harbour of the Pleasance that survives[25] fixes its W. end, but its width is much more difficult to decide. As the surface of the platform stands at 261·5 ft. O.D. it should now be fairly easy to determine the real area of the mere instrumentally.

We can therefore perhaps postulate the following sequence. The lower part of the tiltyard causeway at the gallery tower is natural rock, and natural rock was also exposed in the lower part of the N. face of 'Hawkesworth Gap'. The original causeway was probably smaller than the present one, merely linking these two spurs of higher ground. An outlet channel was dug at the S. end. In the course of time the constant erosion in this channel tended to lower the level of the mere, and in order to overcome this the overflow channel was constructed, perhaps on an original bridge abutment. At the same time the level of the causeway was raised.

In order to test this suggestion of two periods of construction of the causeway a rather hurried section of the S. side of the 'Hawkesworth Gap' was made with a mechanical shovel while the material was already being shot into it. The greater part of the structure was exposed in section and a very clear line of gravel pan running across the section 12 ft. below the present surface leaves little doubt as to the original size of the causeway (PL. XIX, B). The original ground surface was less easy to detect, but was established with reasonable certainty. The respective heights above O.D. were : original surface, 250·03 ft., the flat top of the earlier causeway, 258·4 ft., and the existing surface, 270·21 ft. In other words at this point, in the centre of the valley, the original dam had been 8 ft. high, but its surface was 3 ft. below the new mere level and for this reason it had had to be raised about 12 ft.

The new high level of the mere affected the whole castle. At the N. end it made possible the construction of the double moats described by Dugdale.[26] There must, incidentally, have been some control point on the N. side to overcome the same difference of level between the E. and W. sides of the castle. Similarly it also made possible the addition of the Brays at the S. end, whose moat could hardly have been flooded from the low level. The entry point from the mere into the Brays moat is now unfortunately covered by the modern farm road. The consequences for the outer bailey of the castle must have been even more profound, since the line of its curtain on the W. side was determined by the edge of the mere. P. A. Rahtz in an extremely valuable section across the outer bailey[27] has shown that just behind the curtain wall is a ditch dug in the 12th century and filled in *c.* 1200. Another ditch was then dug behind this and formed a defence for the inner bailey, while the new curtain was built outside the old filled-in

[23] The orders for 'slighting' the castle between July and October, 1649, are in *State Papers* (*Domestic*). *1649–50*, pp. 230, 247, 345.

[24] *Archaeol. J.*, CI (1944), 94 ; *History of the King's Works* (H.M.S.O., 1963), II, 684.

[25] *Med. Archaeol.*, VIII (1964), 222–3.

[26] Dugdale, *op. cit.* in note 18, p. 249a.

[27] *Med. Archaeol.*, V (1961), 319–21.

ditch. The likely explanation for these peculiar events is that a raised level of the mere had now made its edge the natural perimeter for the castle. The base of the outer curtain stands at 265 ft. O.D., 3·5 ft. above the raised level of the mere. These changes probably took place in King John's or early in Henry III's reign,[28] the normally-accepted date for the outer curtain.

Evidently therefore an accurate knowledge of the changes in level of the mere is likely to lead to a greatly-increased understanding of the early history of the castle.

M. W. THOMPSON

RUFFORD ABBEY, NOTTINGHAMSHIRE (FIG. 32)

A brief note on the excavations undertaken in 1956–7 by the Ministry of Public Building and Works to determine the extent and condition of the remains of Rufford Abbey outside the later house of that name has already been published (*Med. Archaeol.*, II (1958), 191). The work was directed initially by Mr. T. L. Jones and later by Dr. M. W. Thompson, and the plan (FIG. 32) provides a reconstruction based on the foundations and robber-trenches then revealed and the surviving remains within the house. The only major points that remain undetermined are the positions of the S. walls of the kitchen and the monk's frater, this part of the site having been thoroughly disturbed by modern concrete foundations.

Although the plan shows that Rufford conformed to the normal layout of an English Cistercian house of the second half of the 12th century, it presents several points of interest. The church was intended to be of typical Bernardine plan, but by the time work had reached the W. side of the crossing a decision seems to have been taken to increase its scale, for the inner transept chapels are not in alignment with the nave aisles and the distance between the pier arcades of the nave is greater than the width of the original presbytery estimated from the robber-trench marking its N. wall. The S. aisle of the nave was probably laid out first, to give a base for the construction of the claustral buildings, and the foundations for its two E. bays were clearly intended to carry compound piers. When the N. arcade was built a change was made in favour of foundations for cylindrical piers with slightly different spacing, suggesting that the temporary church required by Cistercian regulations (*Lib. Antiq. Definitionum*, dist. iii, cap. i.) may have stood here and, until its demolition, prevented the builders from sighting through the arcades. The length of the nave can be estimated at seven bays from the position of its W. wall, which is indicated by toothing on the N. wall of the W. range. The varying width of the robber-trenches shows that the N. aisle was buttressed. Later in the middle ages the S. wall of the presbytery was rebuilt and provided with a foundation for a large buttress at the SE. angle. Although it was not increased in length, the presbytery now became substantially wider at the expense of a marked lack of symmetry and the sacrifice of the inner chapel of the S. transept.

The survival of the footings of buttresses of good projection under the floors of the later house shows that the E. alley of the cloister was rebuilt in six bays, probably when the upper parts of the W. range (now being investigated) were remodelled in the 14th century. The S. alley contained a lavatory at its W. end in the same position and of the same type as that partly remaining at Thetford Priory. The buttressing of the chapter-house shows that it was a normal rectangle of three by three bays ; south of it, the cross walls for the inner parlour and the infirmary passage can be identified. A similar cross wall confirms the site of the monks' day stairs in the usual Cistercian position at the E. end of the S. range and shows that a small chamber was won out of the space beneath them as at Fountains and Salley and as recently investigated in detail at Newminster (*Archaeol. Aeliana*, XLII (1964), 141–6). The position of the warming-house was confirmed by the discovery of fragments of its fireplace.

[28] The dating really depends on the reference (*Cal. Lib. Rolls, 1240–5*, p. 71) in 1241 to the wall, that threatened to collapse into the pool, needing repair.