ART. XI.—*Herring-bone Work, as seen at Egremont Castle.* By JOHN F. CURWEN, F.S.A.

*Read at the site, Sept. 14th,* 1927.

SIGNOR Rivoira in the English edition of his *Le Origini dell' Architettura lombarda,* says that the method of herring-boning goes back to a remote period. Employed at first in brick floors, as long ago as the time of Augustus, until, in the decadence of the Roman Empire, it passed from the pavement to the walls. In Rome it never took hold, nor was it more successful in establishing itself at Ravenna; it is rare in Pavia, but very popular at Verona and in north Italy generally.

From Lombardy the method appears to have spread beyond the Alps. Mr. R. G. Collingwood points out that the Roman ford at Old Ford, across the Lea (London) is paved with herring-bone;* and also that the technique exists within the core of Hadrian's Wall,† as also in the town walls of Silchester and London, but that he has never noticed any case of herring-bone facing in such walls. On the other hand, according to illustrations in Artis's *Durobrivae* (1828), some Roman Villas in Castor, Northamptonshire, had not only their outer walls but the partitions built and faced almost entirely of herring-bone work.

Prof. Baldwin Brown says that it is specially in evidence in a class of buildings in France ascribed to the 8th century period of Charles the Great; and he goes further by saying that the technique was handed down to the Normans who employed it in simple forms.

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* *Proc. Soc. Ant.*, xxiii, 237.

† Bruce, *Roman Wall*, 1st. edition, pp. 90-91.

There is no evidence that it was ever employed by the Saxons in England. In the Roman fashion of constructing a thick wall of core and then facing it up with ashlar, the facing could be ornamented either with squared stones placed diagonally, their *opus reticulatum*, or with herring-bone (*opus spicatum*), or with horizontal lines of tiles, and the like. But, in the thin Saxon walling constructed without a core, such ornamentation was not so practicable. The Saxon seems to have relied almost entirely upon the pilaster-strip for ornament.

There are some buildings of a Saxon character still existing however, which show herring-bone work. For instance at St. Peter's, Monkwearmouth, we find such work apparently going right through a thin Saxon wall. It was supposed at first that Benedict Biscop, in the year 675, went over to France to engage workmen to build his church,* but Mr. John Bilson has recently shown† that it was more likely to have been built after the Conquest by an English mason employed by a Norman lord, and that he followed his old building traditions, such as the relative thinness of the walls, and strengthened them with herring-boning as his lord bade him.

In like manner we can only suppose that the herring-bone work on the inner face of the apse at Deerhurst‡ and in many other portions of the earliest work there, was executed.

We thus come to the transitional period known as the Anglo-Norman overlap, when " the Conquest was politic-

* Bentham, *History of Ely*, p. 21; Plummer's *Bede*, i, 368.

† *Archæologia*, vols. 72, and 73.

‡ Since reading this paper, Mr. W. H. Knowles has contributed a delightful paper on Deerhurst Priory Church to *Archæologia*, vol. 27, in which he says that the foundations of the apse are " carried through a loose sandy earth to the level of a marl stratum about 7 ft. below the floor level . . . . . the depth of the walling was occasioned by the fall of the ground from west to east, and by the need of securing a reliable foundation on which to build." This agrees with my suggestion, as we shall presently see, that herring-bone work is found chiefly in foundations resting upon a sloping or treacherous subsoil.

ally, but not yet socially an accomplished fact";* and still later, to the return of thick walls erected by the Early Normans themselves who undoubtedly used herring-boning extensively.

But what was their purpose in so employing it? Prof. Baldwin Brown can only feel that it was still wrought for the purpose of ornamentation. But if so, to take but one instance best known to us, why do we find it employed at Brough Castle, in the foundations and below the level of the ground? J. H. Parker in his *Glossary of Architecture*, says that it was used for levelling up the courses of masonry, *i.e.* by varying the inclination of the stones it was easy to preserve the level. Using the same line of thought others have said that it was chiefly used for underpinning, that the exact height to be filled could be accomplished by the amount of inclination given to the stones. But if so, why was it necessary to use ten rows of herring-bone as we find here, to obtain the exact height and level?

Mr. John Bilson points out that he can find nothing about it in Choisy's unindexed *Histoire de l' Architecture*, and that M. Camille Enlart† speaks of herring-bone work in association with other decorative facings. But with Rivoira it is somewhat different. He says that the employment of herring-bone work was sometimes due to a mere whim of the builders, perhaps with the object of indicating the participation of a particular gild in the works. Or it may have depended upon the material available, where "builders in the districts near the Alps were obliged to make use of large pebbles which had been worn smooth in the beds of the rivers." "In a third class it was due to a combination of decorative and constructive purposes."‡

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* Collingwood, *Northumbrian Crosses*, 174.

† *Architecture religieuse*, 2nd edition, vol. i, p. 13; *Manuel d'archeologie française.*

‡ *Lombardic Architecture*, English Edition, 1910, i, 166.

EGREMONT CASTLE: THE CURTAIN WALL,
Showing the herring-bone work.



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But wherever its use in early Lombardic Architecture it is clear to my mind that we can only get at a true explanation of the Norman use of herring-boning by considering it from a purely *constructional point of view*. And to do this thoroughly it will be necessary to analyse every known example in England. So far the subject has not received sufficient attention, perhaps, because it is so extremely difficult to find out where such work exists, as intentional walling, apart from mere reparation patch-work in small pieces. For the moment therefore let us examine what we do know:—

*Herring-boning is found firstly and chiefly in foundations or in the lower courses of the wall.*

BROUGH CASTLE. Last year we found a quantity of it below the level of the ground in the foundations of the Early Norman keep. Now this keep stands on a motte raised considerably above the site of the Roman Fort. There is no question of ornamentation, but rather a keen desire to gain the maximum cohesion in the foundation on this raised artificial mound.

EGREMONT CASTLE. Here we find an exceptionally large mass of it in the curtain wall, and in the lower portion of the Gate House, where there is no call for ornamentation, but just where it was thought necessary to widen out the bailey to the very edge of the steep escarpment, and where the builders naturally would have great anxiety as to the foundation slipping. And as a proof of their wisdom it is the one piece of original walling still existing.

TAMWORTH CASTLE. Here there is a curtain wall which rises steeply up the side of the motte, from the Gate House to the Shell Keep on the top. The whole wall is constructed with herring-boning twenty-one courses deep, and obviously with the intention of preventing the wall from sliding down the hill.

GUILDFORD CASTLE. Here the rectangular Norman Keep

has been built upon the artificially raised ground of the earlier motte, a rare and exceedingly dangerous procedure, but with the employment of a considerable quantity of herring-bone work the result has justified the means, for in its 63 feet of height there is not a crack or mark of settlement in the whole edifice. Compare this with the case of Cardiff Castle, where a tower placed in a similar position *but without herring-boning*, has slipped bodily down the side of the motte.

SPRINGTHORPE CHURCH, Lincolnshire. Herring-bone work is found low down in the tower walls, where the foundation was weak.

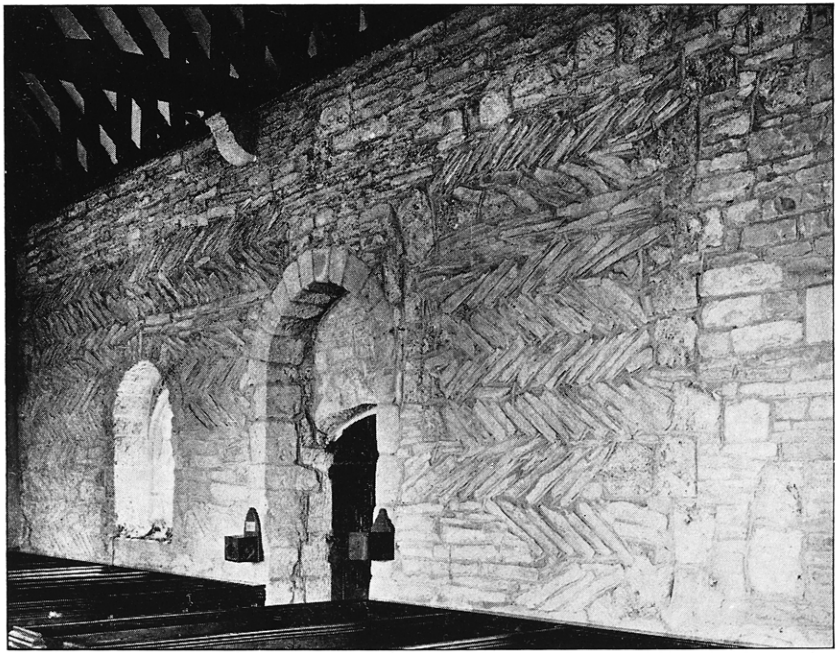
DUNTISBOURNE ROUSE, Gloucestershire. Here again in this Early Norman Church it is found in the north wall of the nave at the ground level near the quoins of the church so as to stiffen the corners.

ST. LEONARD'S CHAPEL, at Leonard Stanley, also in Gloucestershire. Here in the ancient Rectory Church the work is found in the south wall, and in the only remaining bottom course of the ruined apse. The apse was taken down early in the 14th century when the Chapel was enlarged 5 ft. eastward. Illustrated in *Archæologia*, vol. 71, p. 224.

UPTON CHURCH, near Gainsborough, and

BURGHWALLIS CHURCH, near Doncaster, where Prof. Hamilton Thompson points out " the lowest stages of the walling are constructed with tiles laid obliquely on edge."

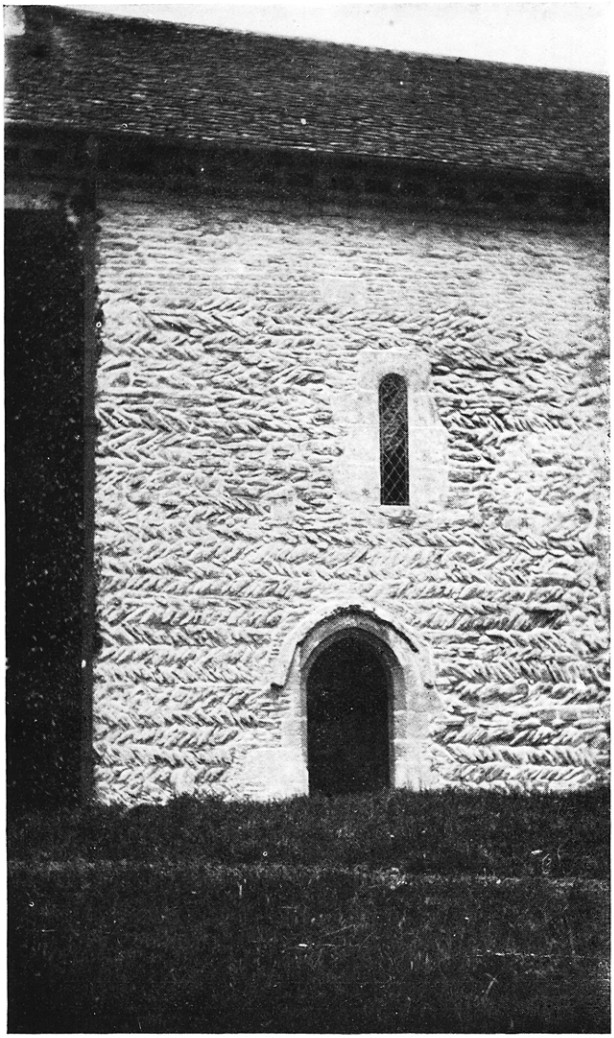
YORK MINSTER. In the present crypt and difficult of access there still remain the foundations of the elongated side walls of Archbishop Thomas of Bayeux's apse (1070-1100). These walls, now covered outwardly by Archbishop Roger's crypt (1154-1181) and inwardly by thin modern walls, are each some 45 feet in length and 4 ft. 8 in. in thickness. The lower courses are faced with such rough herring-boning that no one could pretend that the work was executed for ornament.



ASHLEWORTH CHURCH—HERRING-BONE WORK.

Bristol and Gloucestershire Archaeological Society's Transactions xlviii, facing p. 380.

*By the courtesy of The Bristol and Gloucester Archaeological Society.*



SOUTHROP CHURCH GLOUCESTERSHIRE.

Bristol and Gloucestershire Archaeological Society's Transactions, xliv, facing page 49.

*By the courtesy of The Bristol and Gloucestershire Archaeological Society.*

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*Secondly herring-boning is found occasionally in wall surfaces.*

DIDDLEBURY CHURCH, in Shropshire. Here there is some veneer work placed over the interior of the north Saxon wall, which is clearly work of refacing or reparation.

ASHLEWORTH CHURCH, Gloucestershire. On the inner face of the north wall of the nave, which is about 2ft 7 in. thick and dated to the first period of the twelfth century, there is a remarkable piece of the work which does not show on the outside. It is largely built with " Tufa " stone.*

SOUTHROP CHURCH, in the eastern Cotswolds. Here both the north and south walls of the nave are largely built of good herring-bone masonry showing on the exterior. The work is assigned to a post-conquest date.

*Thirdly Herring-bone work is also found at the top of Church Towers.*

BRIXWORTH CHURCH, Northants. The technique is found in the upper part of the Saxon Tower, and also in the upper part of

CARLTON-IN-LINDRICK CHURCH. Both of which are cases of Norman addition or reparation.

MARTON CHURCH, Lincolnshire. The west tower is tall and slender and is built of herring-bone rubble.

WEST MERSEA CHURCH, Essex. The tower is likewise built of herring-bone alternating with courses of flat horizontal stones.

Doubtless in these instances the work was to a certain extent ornamental, but there can be little doubt, but that it was chiefly wrought for the purposes of strength, and

* Tufa starts life as a moss, which in course of time petrifies by calcareous waters into rock. It is very light, extremely durable, and was readily obtained and used by the Normans, especially on such sites where Caen and Egremont stone would be too expensive. Some of the streams in Gloucestershire and Derbyshire deposit it, and at Matlock Bath it is readily sold to-day for rockery purposes at £1 per ton.

for preventing the tall and slender tower walls from spreading, just as we should now use the iron tie-rod.

BROUGHTON CHURCH, Lincolnshire. Just above the tower-arch into the nave there are a few courses of the work, as if to form a relieving lintel to the arch.

Some day I shall hope to have more examples, but if you can follow me so far, and if you can conceive that such work, when laid in hot grouting, would make a *powerful dovetail for tension* you must come to the conclusion that the peculiar construction was not done for ornament, but wholly for strength or for tie to prevent lateral slide.

The later Normans used the technique in small patches for repair as can be seen so well outside Scolland's Hall in Richmond Castle, but after their day it appears to have died out. I do not know of any examples in Gothic building.