

R E P O R T

OF A

SURVEY OF THE DILAPIDATED PORTIONS

OF

HEREFORD CATHEDRAL,

IN THE YEAR 1841 :

BY

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HEREFORD :

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The DEAN and CHAPTER of HEREFORD, in giving to the Public this interesting and valuable report, cannot refrain from expressing their thankfulness to the LORD BISHOP of HEREFORD, for having suggested a reference to Mr. PROFESSOR WILLIS, as a measure which could not be otherwise than satisfactory to all parties, and for his kind intervention in obtaining the PROFESSOR's consent. To that gentleman they cannot adequately express the sense they entertain of the zeal and ability which he evidenced in the investigation of their venerable Cathedral, and the obligation which they gratefully acknowledge for the laborious and indefatigable attention which he devoted to it.

Hereford, March 1, 1841.

Cambridge, September 22, 1841.

GENTLEMEN,

In compliance with your request, I have examined the Cathedral of Hereford, and have embodied the results of my observations in the accompanying Report, in which I have endeavoured to describe the present state of the building,—especially of the tower and its piers,—as well as to trace the history of its several failures and repairs—an investigation which will, I hope, possess some interest for you. In pointing out the parts which require immediate restoration, I have not ventured to indicate the exact manner or extent of the repairs, which must of course be left to the judgment of your architect, whose skill has been already so successfully exerted in the similar cases of Rochester and Armagh. Should I not have succeeded in making myself intelligible in any portion of the following pages, I shall have great pleasure in supplying the required explanations, and remain,

Gentlemen,

Yours most sincerely,

R. WILLIS.

*The Very Rev. the Dean
and Chapter of Hereford.*

ON THE PRESENT STATE
OF THE
CATHEDRAL OF HEREFORD.
AND ON THE
CAUSES WHICH HAVE LED TO IT.

Every part of the building exhibits settlements and consequent distortions to a much greater degree than is generally the case with buildings of the same age. Thus, the eastern gable of the choir inclines considerably to the east, and the south wall of the Lady Chapel to the south; the walls of the north transept incline northwards and outwards in all directions, and the buttresses of its western wall are also thrust northwards. The north porch, commonly attributed to Bishop Booth, is also considerably inclined to the north, and the piers of the nave to the west; in short there is scarcely a vertical wall or pier in the whole building, with the exception perhaps of the Audley Chapel.

When these several settlements are carefully examined,

they appear to be of such a nature as would arise more from compression of the ground or foundation upon which they stand, than from weakness of the walls themselves, for these walls and piers are not bent into a convex form, as they would be if they had given way from constructive weakness, but are thrust bodily over, sinking into the ground on the yielding side. This may, for example, be observed in the piers of the nave, near the great tower, both on the north and south sides.

The greater part of these settlements however, can be shewn to be of great antiquity, having as might be expected, taken place very soon after the building was finished, and there is no fear of their going any further, except in those cases in which the original settlements may have so weakened the walls, by fracturing and displacing their materials as to allow them to sink under their own weight or that of the subsequent additions.

For the purpose of examining the nature of the foundations, excavations have been made by Mr. Cottingham, at the bases of the piers on the south side of the nave, and about that of the northern piers of the tower. From these, as well as from an excavation in the centre of the nave, it appears that at a depth of about seven feet below the present pavement, there is a firm bed of gravel, which, from deeper sinkings in the neighbourhood of the Cathedral, is ascer-

tained to extend to a great depth, forming what must be considered to be an unexceptionable foundation ; and since the new work of Mr. Wyatt, as well as the Audley chapel remains perfectly upright, it is thus shewn that the ground when properly treated admits of a solid bearing. Again, as the settlements might have been supposed to have arisen from springs of water immediately under the building, search and enquiry has been directed to this point without discovering any. Immediately upon the surface of the bed of gravel, a wall about five feet high is placed. The stones of which it is built are rough from the quarry and are in seven courses ; they are from 15 to 18 inches long at the lower part, and rather less at the upper, and the breadth of the wall is about four feet greater than the bases of the piers which stand upon it ; two of these walls appear to extend from one end of the Cathedral to the other—from west to east,—the one receiving the northern and the other the southern range of piers as well as the piers of the central tower. The squared masonry of the bases of the piers rests upon the upper surface of these walls. Of course the rough structure of the walls prevents the detection of any settlement or displacement ; but I am of opinion that it is rather this basement wall, than the gravel below which has given way, and allowed the piers to sink down and lean over as they do at present.

The walls of the Audley Chapel are, as already stated, perfectly upright, but the south wall of the Lady Chapel, against which it is erected, and into which its masonry is bonded, declines very considerably to the south; plainly, therefore, this settlement must have existed before the Audley Chapel was erected, and cannot have increased since the year 1500; on the other hand, the eastern gable of the Lady Chapel is in a state of ruinous disintegration, and requires immediate repair to save it from the fate of the west end of the Cathedral. The inclination of the walls and buttresses of the north transept, and of Booth's Porch, are original settlements, and nothing is to be apprehended from them or from that of the eastern gable of the Choir, the entire ponderous Norman wall of which, has evidently gone to the east, and possibly its upper gable may have been reduced to such a ruinous condition as to have justified the rebuilding of it by Mr. Wyatt.

But my attention has been more particularly directed to the state of the tower, and to understand the result of my observations, it will be necessary to say somewhat of the history of its erection.

It is clear that the piers and the four great arches that rest upon them are of Norman work, and that at some subsequent period, the present tower, which rises above the roofs, was added. Whether a Norman tower was ever carried

above the roof, and consequently taken down to make way for the present erection, is uncertain; I am inclined to think not. The line of demarcation between the Norman wall and that of the added tower is easily traced. The upper limit of the Norman work is marked by a string course, ornamented with a double row of little arch-heads, and the additional work commences just above this, in a manner that will be described below. The erection of this tower is not recorded, but from the style of its ornaments, may be fixed at the beginning of the fourteenth century. The date usually assigned to it is a century earlier—it being supposed the work of Bishop de Braos; but this date, repeated by every successive historian, merely rests on a passage of Godwin, who in his biography of this Bishop,* says, “That his effigy has a model of a tower in its hand, whence he *conjectures* that he must have been the builder of the central tower.” This date is thus founded upon no document, and being contradicted by the now well-understood architectural style of the tower, may be dismissed as possessing no authority. It is much to be regretted that the period of erection of no one part of this Cathedral has been recorded, with the exception of its first foundation. It is established, however, that Bishop Cantilupe died in 1282 and was buried in the Lady Chapel, that his reputed sanctity and the

* De Præsulibus, 1616, p 536.

miracles which were said to have been wrought at his tomb, brought considerable sums to the church, and that his body was removed to the north transept in 1287; also that he was canonized in 1307.

The style of the north transept agrees with the supposition that it was erected for the reception of the shrine of Cantilupe, between his death and the translation of his body; and the superior magnificence of the design bespeaks the increase of riches and consequence which this event had brought to the Cathedral. To the same source and the same circumstances may be attributed the new tower, of which, if we place the date at about 1300, or a little later, it will appear to have been undertaken immediately after the completion of the north transept, and probably from the funds which still arose from the same profitable source. And this may account for the omission of any recorded founder or benefactor in connection with either the work of the north transept or of this tower; for it may be generally observed, with respect to the buildings of the middle ages, that when they were carried on by their monasteries, no record is preserved of the work, but only when some considerable portion of it, as a tower, a transept, or the vaulting of an aisle, was undertaken at the expense of an individual. Thus it happens in the present instance, that the building of the Lady Chapel and its vestibule, the clerestory and vault of the choir and nave,

all of them works of the twelfth and thirteenth centuries, are not recorded. To be sure Leland has recorded of Bishop de Vere, who died in 1199, that he constructed many remarkable edifices (on the authority of his epitaph), and we may assign some of these works to him, if we please.

To return however to the tower; it is evident that at the time of the addition of the present tower, the piers and the four great Norman arches, upon which it was placed, were in a state of great dislocation and settlement.

If the *south-east* pier be examined in connection with the *east Norman wall* of the south transept, it will be seen that the masonry of the latter wall near this pier, has been dragged downwards by the settlement of the pier. This is very visible on the inside of the building above the vault, as well as on the outside of the clerestory. It is also shewn by the bending downwards of the string mouldings in the interior of this transept, and also by the difference of level of the opposite impost mouldings of the small Norman arch, which opens between this south transept and the south aisle of the choir; for we may assume that all these things, namely, the courses of the masonry, the string mouldings, and the two imposts of the arch, were originally respectively level. But when the respective downward dislocations of these three things are carefully measured, they are found to be exactly the same, namely, three inches and a half; and

as they are situated at different altitudes, we may conclude that this pier has sunk *bodily downwards* into the foundation through the vertical space of three inches and a half with respect to the wall of the south transept which is of the same age as itself; but as the foundation is thus shewn to be compressible, it must be supposed that the wall itself must have sunk, although in a less degree, than the pier, and therefore that the *actual sinking* of the pier must have been greater than three inches and a half. In fact, by levelling the courses of masonry in the clerestory wall of this transept, immediately above the vault, I find a difference of level of about ten inches between the southern and northern extremities, which is manifestly due to sinking, and not to inaccurate workmanship, because the courses run nearly level over the piers, and sink in stages over the window heads.

A great settlement or subsidence is thus shewn to have taken place between the Norman pier and the Norman wall in connection with it, as well as a positive sinking of each into the foundation. The Norman wall of the choir has also sunk to the same extent, and as the Early English string moulding of its clerestory exhibits the same depression, we must either suppose that the depression happened after the clerestory was added, or that this string moulding was laid upon the Norman wall without levelling it, a supposition which is not inconsistent with the known roughness of the

work of that age. The settlement of the south wall of the south transept cannot now be measured, because a large Perpendicular window was inserted on this side, and the wall over it entirely rebuilt during the fifteenth century; most likely because this part of the wall had been entirely shattered by the subsidence of the tower. Neither can the settlements of the tower piers, with respect to the walls of the nave, be ascertained, in consequence of the entire rebuilding of the clerestory and triforium by Mr. Wyatt.

The two southern piers of the tower being in immediate connexion with walls of their own age, their subsidence is thus as it were recorded for our information. But the two northern piers are now connected with the northern or Cantilupe transept, which was built more than two centuries later, and probably replaced a Norman transept similar to the southern.

The eastern clerestory wall of this north transept, is, however, not at all disturbed by dragging downwards with the pier, and we may therefore conclude that the subsidence of the piers had ceased before the year 1300, for it will be shewn that the two northern piers had in themselves suffered quite as much, if not more, from settlements than the southern ones. If then, their junction with walls two centuries later, exhibits no signs of relative motion, we may plainly infer that all the subsidence of the piers had taken

place before these walls were connected to them. It is true that the western wall of the north transept, exhibits a great dislocation of form; the entire mass of masonry which forms the southern side of the lofty window, forty feet high, has shrunk and slipped away from its junction with the Norman wall, and settled downwards and northwards, bulging out and bending the iron bars of the window, and rendering an immediate repair necessary. But this is a local settlement, unconnected with that of the Norman pier and occasioned by the difficulty of establishing a firm bond between new work and old, for the clerestory and the upper part of this wall between the roofs exhibit no signs of having been dragged downwards by the tower pier.

When the great piers themselves are examined below, especially the two western, it is evident that they have suffered great disturbances. The greater part of the original Norman ashling is now either covered by subsequent casing, or has been removed and rebuilt; nevertheless, the Norman capitals, from which the four tower arches spring, remain, and on several faces of the piers, the position of the corresponding shafts can be ascertained. This is the case with the southern face of the north-western pier. The lower portion of the pair of Norman shafts remains with the bases, and one of them still exists to the height of thirty-three feet. These shafts are *still* vertical, but the capitals, which undoubtedly were originally placed imme-

diately over them, are now removed by settlements, together with the entire western arch of the tower, through the enormous space of ten inches and a half to the west. Also two cylindrical piers of the nave on each side, and contiguous to the piers of the tower are pushed bodily over, so that their impost mouldings are now four inches and a half to the west of their true position; in fact every pier of the nave has gone to the west in a slight degree.

The Norman nave-arches which rest upon them have suffered a corresponding distortion of form, which is the most evident in that arch which connects the first cylindrical pier on the north side, with the half column that projects from the tower pier; for the half column has remained upright while the cylindrical pier has been pushed over as already described.

The Norman triforium and clerestory which once surmounted these piers, were destroyed by Mr. Wyatt, but the nature of the settlements just described—namely, that the capitals of the tower piers have gone so considerably to the west, while the lower half of the same pier remains vertical, and yet that all the piers of the nave are also driven to the west,—demonstrates that the upper part of the pier must have separated itself from the lower, by a diagonal fissure extending from the upper eastern portion to the lower western, and that the western half of the mass so separated, must have slipped downwards, and by pressing

against the walls and columns of the nave, have produced their present change of position.

And that the upper part of this pier with the entire western tower arch sank in this manner downwards and westwards, will also be shewn from the present state of the Norman string course over the great tower arches. I should also mention that the capitals of the shafts on the western face of the north-eastern pier have been similarly driven to the north about four inches, and that the south-western pier has undergone nearly the same settlement as the north-western. Now the upper extremities of the great piers having thus moved from their true position, the four great Norman tower arches which rest upon them, are necessarily distorted in a very great degree.

Two of these arches, the north and south, are smaller than the east and west: the respective spans being about nineteen and thirty-one feet. Immediately above these arches, a Norman string course projects from the wall; this was of course horizontal when first executed, and its deviations from horizontality serve to mark the extent of the dislocations of the arches below it. The western arch appears to have preserved its form tolerably well, and in fact, as the two piers upon which it rests have gone together towards the west, without diverging, this arch appears to have settled bodily with them without change

of form. The other three arches have suffered great disturbance; their original semicircular outline being now converted into an ellipse by the sinking of the crowns, occasioned by the divergence of the piers; for since the capitals of the north-west and south-west piers have each moved ten inches to the west, and that of the north-east four inches to the north, it follows that all the four arches, except the west, have spread at the feet, and therefore must have sunk at the crown.

I have levelled and examined the present state of the Norman string course, and I find that its north-west extremity is seven inches lower than its north-east, shewing the sinking of the north-west pier, which has been already detected from other appearances. Also the north-east end is two inches higher than the south-east end, and on this side the string course has sagged in the middle so as to fall about six inches lower in the centre than at the two ends, this is produced by the sinking of the crown of the eastern arch; again, the south-east angle is one inch and a half higher than the south-west, and the string sags about four inches in the middle; over the western arch the string course has been removed, but the south-western angle is three inches and a half higher than the north-western. These differences are too great to be attributed to bad workmanship, and they all point to the

same facts that have been attested by the other appearances described, namely, that the piers have all subsided and that the north-western has suffered the most; besides these appearances, the masonry of the spandrels—that is, of the walls included between the Norman arches below, and the string course above,—is in a frightful state of dislocation; for the change of form in the arches has twisted and fractured the stones in all directions, besides drawing them asunder so as to open the joints in many places to the extent of two inches or more. The rubble work in the heart of the wall has lost all cohesion.

Upon these arches, however, and in this state of ruin or very nearly so, did the architect of the tower in 1300 proceed to erect his work. That this was the case is shewn by the following evidence:—The masonry of the new tower begins at the level of the Norman string or a little above it, the junction of the two works being very easily traced. About four feet above the Norman string, a second or gothic string course is placed at the same level as the passage or gallery which runs in the thickness of the wall all round the tower, and upon this string course is supported the singular row of piers which constitute the interior lining of the tower.

Now the Norman string course has been shewn to be completely out of level at the corners, besides sagging in

the middles. But this gothic string course on the contrary, is now so nearly level with respect to the corners, that the difference may be attributed to errors of workmanship, and it has only sagged in the centre about half an inch on the east and north, and not at all on the other two sides. Also the lower bed of the first course of gothic masonry which rests upon the Norman wall, is *exactly shaped* to accomodate the sagging already described, but its upper bed is straight and level, proving decidedly that the entire present settlement of the Norman work had taken place before the tower was added, with the exception of a slight subsequent disturbance, of which I shall speak presently.

On the north and south walls, immediately above the Norman string course, may be traced a regular series of apertures in the face of the wall, about eleven inches square, in which were evidently once inserted the beams of a floor or ceiling. These apertures follow the sinking line of the Norman work, and not the level line of the tower work; consequently they indicate the position of the original Norman ceiling, which is now replaced by a vault of the fifteenth century. As the lines of this vault cut through the level of the floor, this last was necessarily removed to make way for it. These holes on the north side, have been rudely stopped up with blocks of tufa—the light substance used in vaulting—from which, we may suppose that the beams were

removed and the holes stopped when the vault was in progress, and consequently this material at hand.

At all events, the jointing of the masonry shews very clearly that the floor beams were not removed at the time the walls were carried up; for it is evident that the new masonry was built round and about the beams, in a way that it is not easy to describe without drawings, but which plainly shews that the beams were left undisturbed.

At each angle of the tower, and at the same level as these beam holes, is a diagonal aperture higher than they are, and extending nearly through the wall; now the purpose of the beam holes cannot be mistaken, and we have seen that the new masonry was built round them without disturbing them, and I conclude that these similarly diagonal holes also received some timber work, which in like manner was allowed to remain undisturbed.

The interior walls of the tower are of a very singular construction: twelve piers of compact masonry on each side, beside angle piers, are carried up to the height of twenty-six feet, and connected half way up by a horizontal course of stone, in long pieces, and by an iron bar, which runs all round immediately under this bonding course. Upon these gigantic *stone gratings*, if I may be allowed the expression, the interior wall of the tower rests; and they also carry the entire weight of the bell-

chamber and bells. I believe this construction was entirely adopted for the sake of lightness.

It is clear that it was never intended to be seen from below, for there are no means provided to illuminate the chamber so formed, which at present derives all its light from the apertures in the floor of the bell-chamber above it. The external walls of the tower were at the time of its erection buried in the roof, of which the pitch was much higher than at present; and if windows be now inserted in these walls, I am of opinion, that besides weakening the tower in a manner, which considering its antiquity and shattered state, cannot be recommended, they will prove wholly inadequate to supply sufficient light to the chamber in question; for the piers of the grating are only four and a half inches asunder, with the exception of the middle one, which is eighteen inches. Moreover the piers of the grating are of different widths, and their bases irregular, and the whole has no decorative character; and in addition to the fact that no light was supplied to this room in the original, which plainly shews that it was never *intended* to be seen from below, I have shewn good reason for supposing that the ceiling which concealed it was only removed to make way for the vault, so that in fact it never *was* seen from below.

I have thus shewn, that notwithstanding the shattered state of the piers and arches, the architect of the tower imagined that they might be trusted with the support of his new work. We may at least infer from this, that the settlement had ceased to increase long before the year 1300, for it does not even appear that any attempts were made to repair or fortify the piers for the reception of the new load, with the exception of the north-western. The arch which connects this with the first pier of the nave had a new arch inserted under it, and the arches which connected this pier with the north transept, both on the ground and at the triforium, were filled up, leaving only a small doorway below. The ball-flower ornament, which is given to this new pier arch and to a string course on the west wall over this small doorway, serves to shew that this work was done at the same time as the tower, which is covered with a profusion of the same ball-flowers.

However, the confidence of the architect in his old piers and arches was unhappily misplaced; the new walls which have been described as resting on the Norman string, exhibit settlements and fractures not nearly so great as those of the Norman work immediately below them, but still of a very alarming character. In the interior of the tower it is evident that the worst of them is due to the fractures of the stones over the apertures, which as already

described, were occupied originally by the beams and ancient wood work. At the angles especially, the corner piers of the gratings are carried by large stones which cover the diagonal apertures, and are thus unsupported in the middle, and these stones have fractured in every instance, allowing the piers to descend more or less. Also the great eastern arch, the crown of which had sunk so considerably before the tower was added, appears to have sunk about an inch subsequently, which has allowed the stone grating on that side to descend, and has produced rents and fractures at its junction with the walls. The outer surface of the tower walls exhibits similar symptoms to those already described of the interior. At the junction of the Norman and Gothic masonry, the same sagging of the old work over the arches, and the same shaping of the new course of masonry to accommodate this sagging, may be observed, and it will also be seen, that the worst and most alarming settlements are in the old work.

Nevertheless it is evident that the dislocations of this old work had proceeded so far as to destroy the cohesion of the walls, and allow crushing of the stone work to begin, which has proceeded, and probably continued from time to time up to the present, and has now reached to such an extent as to make a thorough repair and renewal of the ashlering of this portion of the walls necessary to prevent

the entire ruin of the tower. The upper part of the tower was originally so substantially built, that when the older portion has been reinstated, this will need comparatively little repair to make it perfectly sound.

Having now disposed of the tower, I will return to its piers in the church below. These piers have evidently been subjected from time to time to a series of repairs and casings which it is not very easy to understand.

I may here refer to a curious document preserved in the archives of the Cathedral which will throw some light upon their history. In this is a bull of Pope John XXII., dated 1319, by which the churches of Shenyngfeld and Swalefeld are assigned to the uses of the fabric of the church of Hereford in the usual form. But the preamble recites that whereas sometime since the dean and chapter of Hereford did, upon an ancient foundation which in the opinion of skilful masons was held to be firm and solid, erect a sumptuous building upon which more than 20,000 marks were expended; that now from the weakness of the foundation, this building so threatens ruin, that the entire fabric must be completely repaired from the foundations upwards; which they are unable to undertake, being also burthened with debts incurred in the procuring of the canonization of Thomas of Cantilupe, &c., &c.

This document must allude to the tower and north transept, which were both of them built upon or in connexion with Norman work, the "fundamentum antiquum" here mentioned. It is important, as shewing that the settlements in the new work, consequent upon its erection on so shattered a substructure, must have begun to shew themselves immediately after its completion. But as the repairs which were intended to avert this threatened ruin, appear to have been confined to the piers below, and not to have been extended to the great arches and their ruined spandrels, we may conclude that the settlements were imputed to the failure of the piers alone; and it may be presumed that the movement was arrested, since we find that the present vault was substituted for the wooden ceiling sometime in the fifteenth century, to judge by its mouldings and fashion, and probably at the same time that the similar vault of the south transept was erected, for if the tower were then in a threatening state, it would hardly have been tampered with by such an alteration. It must be confessed however, that the ribs of this vault are remarkably thin and light, and that it stands completely free of the walls on all sides, resting merely upon the four corbels. This vault must be taken down to obtain proper access to the spandrel walls in the course of the proposed repairs, but it may be replaced.

I will now describe the present state of the four piers in order:—I have already shewn that the south face of the *north-west pier* was originally traversed by a fissure, which allowed the upper western portion to descend; and it is easy to see that the whole of the Norman ashlering to the west of the fissure has been removed and entirely rebuilt. At the upper part, where the shattering and dislocation was the greatest, the face of this new work is brought forwards a few inches; but the remaining portion has the same face as the Norman work, which shows that this repair was not a mere casing like some of the others, but an actual renewal of original ashlar. This repair is crowned by a Gothic string moulding which lies immediately under the Norman capitals; one of these capitals having been, as I suppose, crushed, has been replaced by a plain block of stone, and the whole of the capitals on the eastern face of this pier have been also removed and the new masonry carried much higher than on the southern face. This work, or at least the southern face of it, is probably an ancient repair consequent on the threatened ruin mentioned in the bull of 1319; but the remaining Norman face of this pier seems in course of time to have again exhibited threatening symptoms; for it has been fortified in a very singular and unsightly fashion by cramping against its face a shell of masonry nine inches thick. This masonry is composed of very

long and narrow stones set end-long, but is traversed in the middle and terminated at the height of 33 feet by horizontal courses which serve to bind the work, and probably contain iron bands for the purpose of assisting in keeping the pier together. This casing extends round three sides of the pier occupying portions of the north and south faces, and the whole of the east face; but the original Norman shafts still remain upon this latter face to the height of 23 feet, and the surface of the Norman wall, beneath the casing, does not appear to have been broken into. The whole work is apparently the contrivance of a country mason, and as such, its efficacy is not much to be depended upon. The object of the vertical beds may have been to reduce the number of horizontal joints, and thus to avoid or diminish the shrinking of the work, which is always a source of difficulty when new work is united with old. But more probably the evil to be remedied, was a bulging out of the Norman ashlering, like that which now appears on the north face of the south-western pier, and on the spandrels of the great arches, and these long stones were intended to act like the splinters applied to a broken leg.

The *north-east pier* is repaired in a totally different manner, being completely cased or enveloped in a coating of solid masonry laid in the usual manner in horizontal courses, which have thickened out the pier upon the plan

nine inches in every direction. Whether this masonry is also a mere shell cramped against the undisturbed Norman face of the pier, or whether the Norman ashlering has been removed and the additional work properly bonded into this pier, I cannot tell, but it is very desirable that this fact should be ascertained, as its present efficiency depends very much upon that circumstance. However this may be, it is the work of two different periods. The southern face of the pier shows a nearly vertical fissure or separation of the masonry, and the lines of the beds will be found on examination to be at different levels on the two sides of the fissure which at the bottom and near the top is a mere vertical straight joint. The western half of this casing is the most recent of the two, and their line of juncture at present exhibits the appearance of a dangerous crack. This is occasioned by the inevitable shrinking of the late work from the earlier; and as the pier shews no symptoms of giving way in other respects, it does not appear to impair its stability.

The *south-eastern pier* retains its Norman face on a portion of the southern side, but the western and northern faces, as well as the rest of the southern face, have been entirely and substantially rebuilt; for although the present face advances a few inches beyond that of the original Norman pier, it is evident that the Norman ashlering was

in this case removed. This pier is in excellent condition, and appears to need no repair or alteration whatever. This work may be attributed to the period immediately succeeding the bull of 1319. The corbel which sustains the tower vault, and which rests upon the string moulding which caps this new ashlering, is formed in such a manner as to shew that it was intended to rest upon this string course, and consequently must have been inserted after the string course was completed; the repair therefore in question, must have taken place before the tower vault was inserted in the fifteenth century; but the western face of this pier seems to have been subsequently underpinned.

The *south-western pier* retains on its northern face a portion of the Norman ashlering, with about eleven feet of the shafts; above, and to the east of these, the Norman ashlering has been removed and rebuilt, probably in the fourteenth century, when the other piers were repaired. A long corbel is advanced near the upper part, which carries a projecting pier of masonry, for the purpose of supporting the original Norman capitals, which have been respected and preserved as much as possible throughout all these repairs and alterations. This pier, has at some subsequent period undergone a second repair upon its eastern face, which has been underpinned and brought

forward about ten inches to the east. This work, which is also carried round the southern part of the pier, only extends to twenty feet in height, and then falls back with a chamfer to the original face. It exhibits no signs of settlement, and appears to have been firmly and substantially executed; but the junction of these three different works upon the plain northern face of this pier, greatly increases the shattered appearance of its masonry, for each boundary line, at first sight, looks like a fissure. Also the half round pier, which received the first arch of the nave, has been rudely cut into for the insertion of the pier of a pointed arch, which has been substituted for the Norman arch on this side of the nave; for as the tower pier in question had declined to the west, as already explained, exactly as the opposite pier had done, the Norman arch, on this side, must have been distorted and shattered in the same manner as the opposite one, and probably in so great a degree as to render it necessary to replace it entirely.

In addition to the various repairs of the piers thus detailed, most of the Norman arches in connexion with these piers have been filled up with solid masonry, leaving only doorways. The only one in fact which remains untouched, is the arch which opens between the south transept and the side aisle of the choir. At what period

these and the other repairs were executed, it is not easy to determine. However, these fillings up, as well as the piers of the oxeye masonry, are shewn in the plan of Hereford Cathedral given by Browne Willis, in 1727. This is, I believe, the oldest plan extant, for the Monasticon contains no plan of this Cathedral. Perhaps some of these works are due to Bishop Bisse, who is recorded in the former work as having caused the whole fabrick to be repaired, and the choir new beautified throughout. He occupied the see from 1712 to 1721. The *oxeye masonry* is so termed, because the centre of it is pierced by an opening in the form of the ancient *vesica piscis*, called by workmen, an oxeye.

This masonry completely fills up the two smaller arches of the tower, namely, the north and south, and is itself supported by two segmental arches branching from an octangular central column. It was of course intended to support the arches and tower in their evident state of delapidation, but it is impossible to conceive a more injudicious or useless work than it presents; in fact, the masonry is so absurdly arranged, that it is unable even to support itself. Its mass has settled in two parts upon its two segmental arches, straightening them and descending and abandoning the arch it was intended to support. The settlements and fissures which now appear in this masonry, are merely the

effects of this change of form, and as I do not believe it has had the slightest influence, either for good or evil, upon the building—it may be with safety entirely removed.

I have thus attempted to develope the causes which have brought the building to its present state; and have endeavoured to show that the settlements are of great antiquity, and that many of them are of such a nature, that no apprehensions need be entertained from them, they having taken place immediately after the completion of the work and not having yielded since; also that many of them have arisen from the injudicious junction of the new work with old. But when the facts of the fall of the west-end in 1786 and the evidently impending ruin of the eastern gable of the Lady Chapel are considered, there is too much reason to fear that some of these early settlements may have extended so far in the first instance as to weaken and destroy the integrity of the walls, so as to allow them to sink and be crushed under the weight of the subsequent additions. This is evidently the case with the four great Norman arches, the masonry of which and of the spandrel walls above, is in such a state of ruin as to make an immediate repair absolutely necessary for the preservation of the tower. The piers upon which these arches rest, have been as we have seen, subjected to a series of repairs, many of which have been so substantially

executed as to make them perfectly safe. This is especially the case with the south-eastern pier, which is in excellent order, and with the north-eastern, which exhibits only an original vertical fissure, from which nothing need now be apprehended. The two westerly piers are not in such good condition, and these, as we have seen, did in the first instance, suffer much more from settlement than the others. The mode in which the north-western pier has been repaired or bolstered is unsightly, and may conceal a state of ruin which it is inadequate to prevent. Also the north-western portion of this pier exhibits some fractures, from which there is too much reason to suppose that the heart of the work is in a very unsound condition. For which reasons it would be desirable to remove this casing, and subject this pier to a thorough repair, in the course of which, the real state of the internal parts will become evident, and an opinion may be formed of the necessity for a similar operation upon the south-western pier, of which the northern face exhibits in some parts signs of weakness, which may be merely superficial, but which at all events call for examination and repair.

I do not think it necessary or expedient to restore the original form of the Norman piers. The repairs, which are, as I have shewn, themselves of a sufficient antiquity to claim respect, have so far advanced the faces of these

piers in many places, and removed the Norman shafts in others, and the settlements have so disturbed the capitals from their true positions, that any attempt to restore the original form and to replace the shafts must be attended with very great expense. The existing mode of capping the restored ashlering with a Gothic string, immediately under the Norman capitals, answers every purpose of uniting the two works, with a due regard to appearance.

ROBERT WILLIS.

Cambridge, Sep. 22, 1841.

EXPLANATION
OF
THE THREE DIAGRAMS
WHICH ACCOMPANY THIS REPORT.

The original Norman work is tinted Yellow, and the works of the Tower Light red, the subsequent additions are distinguished from each other, by different tints, as explained below:—

No. 1.

Plan of the tower piers, to shew the alterations of form introduced by the successive casings and repairs.

The outline of the original Norman pier is shewn upon each.

The *north-east pier A*, has received an ancient casing from *a* to *b*, and a more recent one from *b* to *d*. It is uncertain whether these two casings are bonded into the Norman work, or whether they are merely cramped against its face. As they are of different dates, this fact should be ascertained for each. The arches which abut against the pier at *e* and at *f*, have been filled up, leaving doorways only, and this work is merely inserted, without disturbing the Norman face; this has been ascertained by withdrawing stones.

**The colour tints in the original drawings have been replaced by different shadings.

The south-east pier B still shews its Norman face, from *g* to *h*, and the same is undisturbed beneath the filling up of the arch from *k* to *g*. But from *h* to *k*, the outer surface of the pier has been substantially rebuilt.

The north-west pier C, retains its Norman face all round, with the exception of the ashling above *m*, which has been rebuilt, as is more clearly shewn by the elevation of this pier at O (No. 2). At *n*, *o*, and *p*, the pier has been bolstered up with long stones; and at *q*, the archway is filled up by masonry of the age of the tower.

The south-west pier D, retains its Norman face from *r* to *s*; from *s* to *t* the ashling is rebuilt, and from *t* to *v*, a second rebuilding appears, by which the face of the pier is brought forwards, and extended beyond the original Norman line. The north face of this pier therefore exhibits the two junctions of the three works at *s* and *t*; also at *w* the pier has been cut into and a more recent pier inserted, and at *x* the archway is filled up with masonry exactly similar to that at *e*.

No 2.

Section of the tower, with part of the nave and choir, from west to east.

A B, the Norman string course, seven inches lower at A than at B.

C D, the Gothic string course, very nearly level.

a, b, c, d, e, holes in which the beams of the Norman floor were inserted previously to the erection of the vault *k, m, n*. The dotted line is the boundary between the Norman and Gothic work.

f, g, the diagonal holes which extend into the heart of the wall.

The piers of the nave at E and F, are pushed out of the perpendicular, nearly five inches to the west, but G remains vertical; also the capitals at H and K, which were once vertically over their respective shafts L and M, are now ten inches and a half to the west of them, whence it may be inferred that the portion O, P, now repaired with newer masonry, together with the great arch above must have slipped away from the portions T, M, L, G, and thus thrust over the work of the nave. The ancient repairs upon the face of the pier, at Q and R, are shewn by the two tints, of which, the pink is the oldest, and probably immediately succeeded the completion of the tower.

h, k, is the level of the gravel; and the rough wall which rests upon it, and serves as a foundation for the piers, is shewn, as well as the manner in which the piers have been pushed bodily over.

T, the casing of long stones cramped against the Norman face. It must be recollected that the triforium and clerest-

tory of the nave were entirely rebuilt by Mr. Wyatt, I have not shewn them in the drawing of the pier.

W, the oxeye masonry.

No. 3.

Section of the tower from north to south looking east.

A B, the Norman string course which sags in the middle six inches.

C D, the Gothic string course very nearly level.

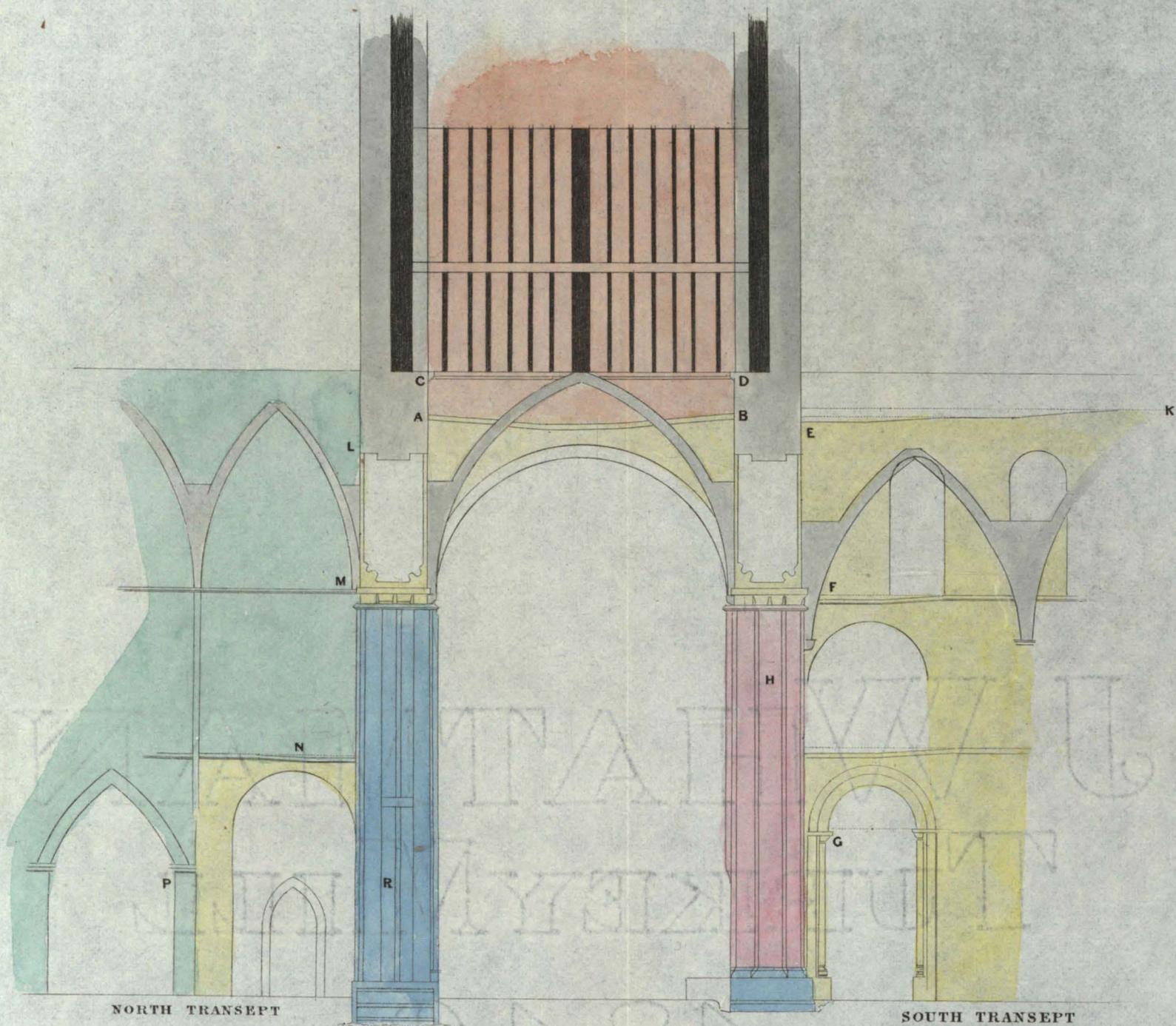
The masonry at E, the string course at F, and the impost at G, have all been carried down through the space of three inches and a half by the pier H, which is thus shewn to have sunk bodily into the foundation.

The total difference of level from K to L is ten inches.

The wall of the north transept tinted green, is two centuries newer than the Norman work, but the wall at L and the string course at M shew no symptoms of the dragging downwards of the great piers, as at E, F, and G, consequently this must have ceased before the wall was erected.

But at N is a local settlement occasioned by the sinking of the Norman arch immediately below it, which has also thrust out the pier at P to the north.

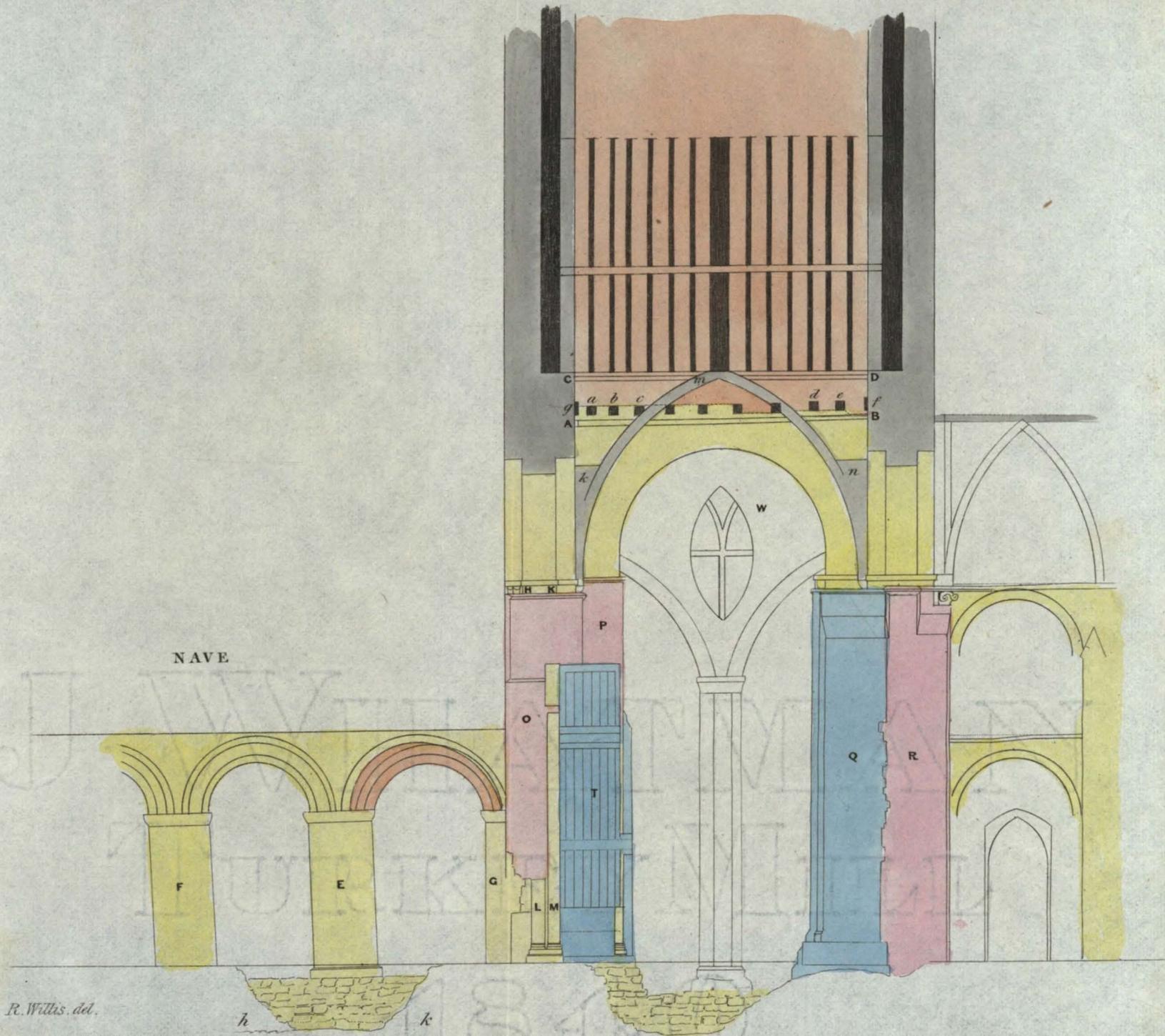
It would seem that the casing on the west face of the pier at R must have been subsequent to the bolstering of the opposite pier, for the plan (No. 1, z, z,) shews that its form is imitated from that produced by the latter at o, o.



R. Willis, del.

Scale $\frac{1}{16}$ in. to a foot.

N^o 3. Section of the Tower from North to South looking East.



R. Willis. del.

Scale 1/16 in. to a foot.

Nº 2. Section of the Tower from West to East looking North.



N^o 1. *Plan of the Piers of the Tower.*

Scale $\frac{1}{8}$ in. to a foot.

R. Willis. del.

LETTERS

FROM

THE VERY REV. THE DEAN OF HEREFORD,

AND

THE REV. PROFESSOR WILLIS,

IN REPLY.

LETTER FROM THE DEAN OF HEREFORD

TO

MR. PROFESSOR WILLIS.

Deanery, Hereford, July 12th, 1842.

MY DEAR MR. PROFESSOR,

I learn from the Bishop that he sent you a newspaper, in which was a Report of our Proceedings at the County Meeting; it was of course, a very imperfect Report, and did not fully detail our humble efforts; however, the result has more than answered our expectations, as it has removed the doubts and prejudices which existed in many quarters.

My object in now writing to you is to request that you will give me a little explanation of one point in your admirable and most valuable Report, which has caused me some little embarrassment.

You say in the last page, after declaring *the necessity of further examination* behind the casings of at least two of the Norman piers, "I do not think it necessary or expedient to restore the original form of the Norman piers. The repairs, which are as I have shewn, themselves of sufficient antiquity to claim respect, have so far advanced the faces of these piers in many places, and removed the Norman shafts in others, and the settlements have so disturbed the capitals from their true positions that any attempt to restore their original form and replace the shafts must be attended with very great expense." Now, as it is obvious that at least two of the piers must be in great measure refaced, and the estimate of the architect includes the restoration of the shafts and piers, would it not be a pity to reconstruct them in their present form, would not the original form be equally or probably more efficient to bear the weight, when so restored, and if so, would not the uniformity of the whole four piers in their original style be most desirable, especially as the capitals, with one exception only, are perfect, and portions of the shafts projecting and visible, I am of course aware that these

must be restored to their perpendicular line. I should be glad to know whether your remarks are merely in reference to the question of expense, or to the safety of the process of restoration, or the efficiency of the piers to bear the weight when restored to their original form as now intended by the architect, who proposes so to restore them, feels confident of the practicability and safety of the process, and has calculated the costs to meet the undertaking. If there were funds for it would it be objectionable to do it? I confess I have no love for the mended portions, and would gladly see the restoration if possible, but I wish to be prudent, and shall be most thankful for your explanation. If you could give it to me before the diocesan meeting of the 21st, at Ludlow, it would be the more valuable to me. I think I before asked if you would allow your Report to be printed with other documents—you cannot fully know how much I value the indefatigable labour which you devoted to the investigation of our fabric, and how thankful we all of us feel to you for such important assistance, and remain,

My dear Mr. Professor,

Your obliged and faithful servant,

JOHN MEREWETHER.

MR. PROFESSOR WILLIS
TO
THE DEAN OF HEREFORD.

Parker's Piece, Cambridge, January 20, 1842.

MY DEAR MR. DEAN,

My object in writing the Report was to confine myself as closely as possible to the questions of structure and history, with a view to discover how much was to be feared from the present state of the building, and how much was absolutely required in the way of repair under the circumstances of very limited funds. Believing as I do, the south-eastern pier to be in a perfectly sound state, and the north-eastern pier to be also quite safe, I did not think myself justified in recommending the expenditure of any portion of the funds upon them. Whether, supposing an ample sum to be raised, these piers should be restored to the Norman form is a question of taste about which much might be said. I have endeavoured to shew in the Report that the ashlaring of these two piers is of considerable antiquity, and that in all probability it is not a casing under which the original Norman work remains, but a replacing of the Norman ashlaring.

These piers will also be covered to a considerable height by the stall work. In Hereford Cathedral, as in many

others, there is a mixture of all styles. The choir is Norman below and Early English above; the north transept Early Decorated; the vault of the tower and of the Norman south transept of Late Decorated work and so on, and all these dissimilar portions are seen at once and do not admit of being changed so as to make the whole Norman in style. For this reason I do not as a question of taste see the necessity of restoring the Norman face and form of piers which are in a sound state. But as the north-western and south-western piers, especially the former, are in a very unsightly garb and unsafe, the experiment of restoration may be tried upon one of them, and it will then be found whether the internal state of the piers and the appearance when finished is such as to justify the expenditure, and also how far the estimate may be relied on, for in works of this nature it is not easy to predict all the sources of expense as in the case of a new building.

I am delighted to hear that my labors have in any shape contributed to the furtherance of so good a work. I can assure you that I always look back with pleasure upon the investigation, which has been to me a source of the greatest possible interest. Pray send it to press if you think that by its publication it will attract any additional interest towards the works. I shall merely request that the proof sheets be sent to me for correction; as, in all probability,

there may be errors and redundancies which have escaped me in the haste of writing.

I have only now returned from London, and I fear this letter will be too late for your meeting.

I remain, yours most sincerely,

R. WILLIS.