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XX.—*On the Recent Discoveries of Portions of Old St. Paul's Cathedral.*

By FRANCIS CRANMER PENROSE, Esq. *F.R.I.B.A.*,

Surveyor to the Fabric of St. Paul's.

Read 29 May, 1879.

IN the spring of 1878 it was requisite to sink a pit, about twelve feet deep, on the south side of the nave of St. Paul's Cathedral, and within a few feet of the walls, for a gas-meter.

Near the bottom of this pit was found a fragment of a foundation which seemed to belong to the old Cathedral. It was evidently not of the Norman construction, because it was partly formed of Norman fragments. It seemed therefore to belong to the cloister or chapter-house.

On comparison of its position with the lines of the old Cathedral shown on a plan preserved in the Wren Collection at All Souls College, Oxford (to a copy of which I had access, and which I call the All Souls Plan^a), it seemed to belong to the passage leading from the Cathedral and cloister into the chapter-house. Search was immediately made on this supposition for the chapter-house buttresses (the Dean and Chapter having approved of the continuance of the investigation), but without result. Evidently the plan could not be implicitly trusted; but, on a renewal of the search, some evidence of the foundations of the west wall of the south transept was found, and, shortly afterwards, three or four bays of the cloister. From these it was easy to reach out to the buttresses of the chapter-house, two of which were found, with a fine group of base mouldings attached to one of them. Both the south-west and the south-east angles of the cloister were found; and the measurement of the bays, both of those trending east and west and also north and south, was recovered, and presented a difference of nearly three feet in the total extent of the cloister, the east and west extension being the greatest. Thus the two main dimensions of the cloister were recovered, the one by direct measurement the other by strong inference.

^a Plate XIII. upper plan.

The thickness of the wall south of the cloister was obtained as about three feet six inches, and at the termination of the transept wall was the base of a flat pilaster in Portland stone—the materials generally used being either Caen stone or Purbeck marble—that is for finished work. This Portland stone pilaster was evidently some of Inigo Jones's work, shown in Hollar's engravings.

The discrepancy between the places got by the discoveries and those shown on the All Souls Plan^a led me to suppose that, as the intention of that plan seemed to be to show the difference between the axes of the two Cathedrals, it might be at any rate trusted so far, and that it was no part of the design of the draughtsman who prepared the plan to care for particular accuracy at the north or south transept or cloister. On this supposition I had a hole sunk on the north of the Cathedral, and at once lighted on the west wall of the north transept, and from it reached the north-west angle of the transept, which terminated, as there was reason to expect, with another Portland stone pilaster, presumably of Inigo Jones's work. I then worked a good deal underground amongst our sewers, in a part where exploration from above was unmanageable, in hopes of finding the north-east angle of the transept, and made several lateral cuttings through the sides of the sewers, but without result, as these foundations seem to have been uprooted entirely.

The works which have been arranged between the Dean and Chapter and the Corporation of London for the improvement and planting of the churchyard gave an opportunity, not to be lost sight of, for making some examinations towards the east, in hopes, first, of finding the foundations of Paul's Cross, and, secondly, of determining the details of the east end. I scarcely imagined that any correction would result to the All Souls Plan,^a where it so positively showed the coincidence of the axes of the two Cathedrals at the east; but I certainly felt that some confirmation was desirable, as that coincidence necessarily involved a rather large, although not unprecedented, deflection of axis in the old Cathedral, and especially as no such deflection had been shown on any plan, nor mentioned in the account of Sir Christopher Wren's proceedings. So far as inference could be gathered from the *Parentalia*, the question was left undecided, for it is there said, on the one hand, Sir Christopher Wren took more ground to the northward than before (which does not appear to any practical extent on the All Souls Plan), but, on the other hand, he "declined the axis of the new Cathedral more to the north-east than it was before." The natural interpretation of which observation seemed to be, that the old Cathedral axis trended to the north-east, but that of the new Cathedral more so. But I had ascertained that the cloister walls, and

^a Plate XIII. upper plan.

therefore the nave, inclined to the south-east about $1^{\circ} 48'$. So that if the *total axis* of the Cathedral inclined to the north-east, the choir must have had sufficient deflection to make it so, and it was impossible to attribute to such an astronomer as Sir Christopher Wren an error as to due east and west. The words of the *Parentalia* are thus:—

“It being, therefore, found expedient to change the foundations, the surveyor took advantage of more room northward, and laid the middle line of the new work more declining to the north-east than it was before, which was not due east and west.”

Considering this remark about the north-east tendency of the axis sufficiently weighty to neutralise that about taking more ground to the north, it appeared to me to leave the positive evidence of the coincidence of the two axes at a point near the east end, as shown on the plan, still uncontroverted, but, as I said before, so far shaken as to solicit confirmation.

The first search was for Paul's Cross; and, in choosing the locality for making this search, I was guided especially by two documents,—by a perspective view given in an old engraving preserved in the Pepys Collection at Magdalen College, Cambridge, which shows the Cross from a point to the east of it, and by another plan preserved in the Wren Collection. This plan, however, is wanting in authenticity, because it is stated by the librarian to have been copied for the library by Mr. Buckler. I call it the Buckler Plan. From what older plan it was copied does not appear, and nothing more seems to be known about it. It gives a very incorrect representation of the choir, but an extremely correct one of the cloister and chapter-house. Accordingly I felt it right, as this was the only plan which marked the Cross, to give it great weight, and it is well that I did so, for every other document seemed to point out a greater distance northwards. The Pepysian engraving came nearest to the Buckler Plan, but still showed the Cross at too great a distance from the Cathedral. The valuable picture belonging to this Society^a (The Antiquaries), as it shows the Cross more from the north, was not taken from so favourable a point of view for determining the distance northwards, but was valuable in helping to fix the eastern limit of the Cross; but it must be remembered that there was some uncertainty as to the eastern limit of the Cathedral, several of the plans giving it an extension which would have carried the east wall forty or fifty feet further than it is now known to be. The preponderance of evidence, however, pointed to its being from fifteen to twenty feet beyond our present east end, and it was upon this basis as respects eastern limits, and upon

^a Page 387.

that of the Buckler Plan, confirmed by the Cambridge perspective as respects northern limits, that the search was made.

It must also be mentioned that the northern limit was taken on the assumption that the All Souls Plan^a gave the axis correctly at the east end, whereas it is really erroneous to the extent of about twenty-seven feet at the point at which we required its guidance. Had I therefore given less weight to the Buckler Plan, Paul's Cross would probably have never been found. After one or two trials some chalk foundations were arrived at which invited further examination to the southward of them, and finally on the 31st of March we were repaid by the discovery of a wall, about three feet high, of yellow oolite, apparently Oxfordshire stone, showing an angle of one hundred and thirty-five degrees, and therefore probably belonging to the octagon we were in search of, and with the quoin formed of Purbeck marble. This wall was followed each way, and seemed of such length, after about thirteen feet had been made in each direction, that the disquieting impression could not be kept down that it must be only a churchyard fence-wall which happened to take that angle between the Cathedral and the Cross, especially as it seemed to be making much too near the supposed line of the north wall of the Cathedral. However, two other angles of one hundred and thirty-five degrees each, with rather more than fifteen feet of wall between each, were discovered, and cleared away all misgivings, and then the other angles were looked for. One was found; the rest had been cut away as too near the foundations of the present Cathedral. And at this particular point there was an especial reason for the destruction of all old foundations to a considerable distance. We read in the *Parentalia* :—

“ In the progress of the works of the foundations the surveyor met with one unexpected difficulty; he began to lay the foundations from the west end, and had proceeded successfully through the dome to the east end, where the brick-earth bottom was yet very good; but as he went on to the north-east corner, which was the last, and where nothing was expected to interrupt, he fell in prosecuting the design upon a pit where all the pot-earth had been robbed by the potters of old time. He therefore sunk a pit of about eighteen feet square, wharfing up the sand with timber till he came forty feet lower into water and sea-shells, where there was a firm beach. He bored through the beach till he came to the original clay; being then satisfied, he began from the beach a square pier of solid good masonry, ten feet square, till he came within fifteen feet of the present ground; then he turned a short arch underground to the former foundation, which was broken off by the untoward accident of the

^a Plate XIII. upper plan.

pit." The foundations of the present Cathedral spread about eight feet outside of the basement wall, so that in performing the operation above recorded all parts of the foundation of Paul's Cross, which came within twenty-five feet of the basement wall, were removed.

The octagonal wall of Paul's Cross, described above, terminated, no doubt, as to its exterior face, with the parapet shown in the old perspectives, and especially in the picture belonging to this Society.^a The interior face formed the abutment to a brick arch, making a ring vault all round for the purpose of carrying the pavement of the ambulatory round the pulpit, which is also shown in the perspective views. The springing stones or *skewbacks*, as they are called, of this vault still remain. One line of nine-inch brickwork was also found, traversing the octagon centrally from north to south, *i.e.* at right angles to the northern face of the Cross. There were no means of judging whether or no there was a similar wall east and west. I think it is probable that there was. This wall or walls would have had something to do with the carriage of the wooden pulpit.

In the excavations made to find Paul's Cross the upper eighteen or twenty inches was formed of black mould. Then there was invariably an indurated surface, sometimes very roughly paved with brick, elsewhere formed of stone chips. This was evidently the ground inside or around the sheds which were there erected, as is shown by an old engraving, during the rebuilding of the Cathedral. Some fragments of imperfect mouldings, belonging to Sir Christopher Wren's work, were found scattered about. The top course of the wall of Paul's Cross, which was found was about two feet below this stratum, itself stood upon a chalk foundation of variable depth. When first opened, the total depth to the chalk foundation was about six and a half feet.

The diameter of the octagon which we found was about thirty-seven feet, or forty feet from angle to angle.

From a combined study of the perspectives referred to, and the Buckler Plan, it would seem that the diameter of the central erection, which formed the pulpit, was seventeen feet or thereabouts.

Whatever may have been the remote origin of Paul's Cross, there can be little doubt that the remains which have been found are part of the work of Bishop Kemp, who rebuilt it. Kemp's episcopate was a long one, so the date is somewhat uncertain. It may be assigned to about 1470.

As it is well known, Paul's Cross was a "platform" much used for sermons having a political tendency. Distinguished ecclesiastics were summoned to preach

^a Page 387.

before the Court. The larger part of the congregation were in the open air. There was always a covered gallery for the King's party, and it is mentioned that when the weather was boisterous the sermons were delivered in the *shrouds*. These shrouds must, I think, have been the galleries formed between the buttresses on the north side, which are shown in the perspective views, and to which access appears to have been given by the low turret staircase near the east end.

The sermons at Paul's Cross played a very important part during the Reformation, and witnessed both the floods and the ebbs of that great conflict. Latimer inveighed against clerical abuses; Fisher, Bishop of Rochester in 1521, anathematised Luther in the presence of Cardinal Wolsey as Papal Legate. Sermons in favour of and opposed to Henry VIII.'s divorce were preached from thence, but in 1534, by the King's command, and confirmed by Act of Parliament, anti-Papal sermons were regularly preached.

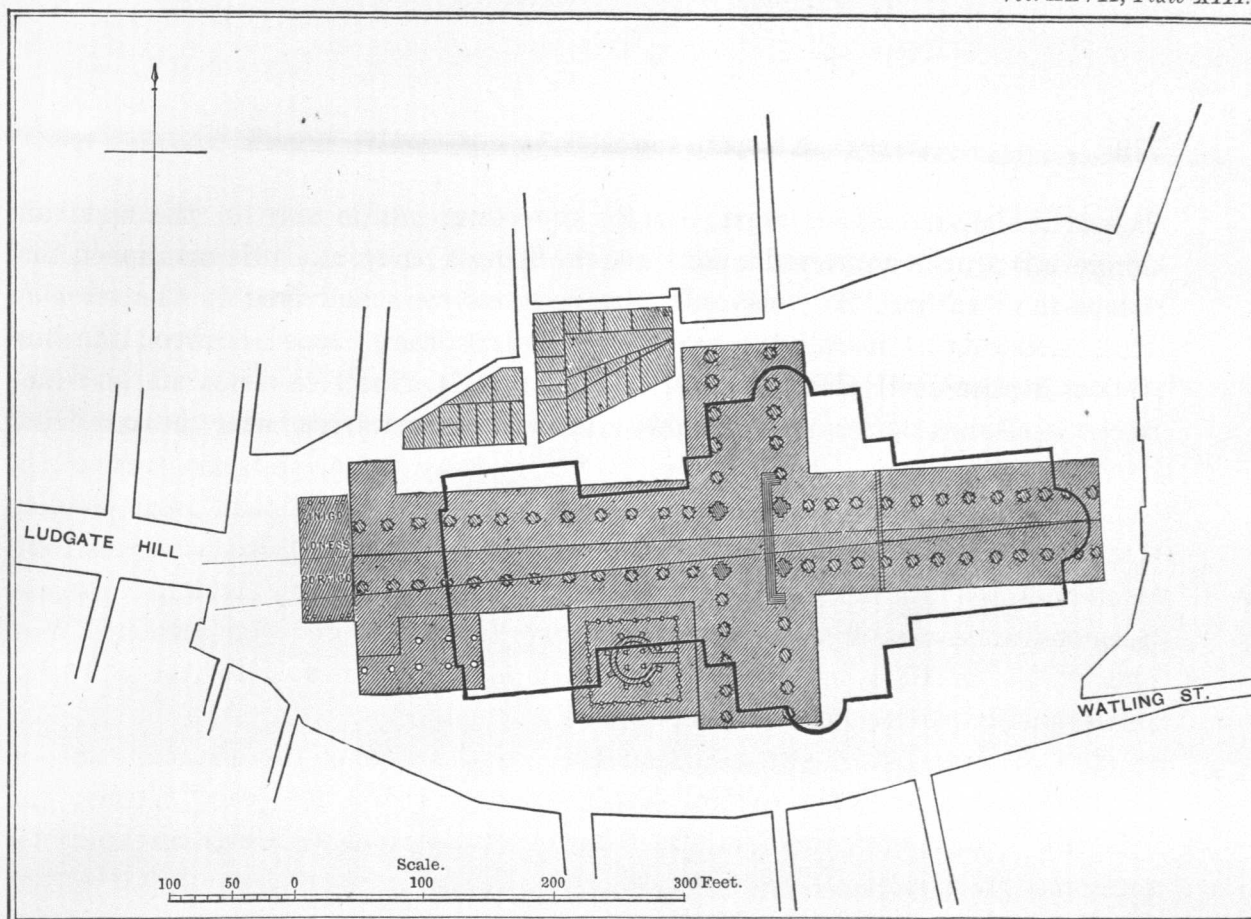
The Cross was still used as it had been in the days of the Plantagenets for political announcements, and on Whit-Monday, 1546, the peace between the Emperor, the King of England, the King of France, and all Christian kings for ever, was proclaimed.

The accession of Edward VI. gave new opportunities for the burning question of the day being heard from the Cross; and still more fiercely, at the accession of Queen Mary, Ridley preached from thence in bold opposition to the Queen. Ridley was imprisoned, and we read of others who were nailed to a pillory at Paul's Cross by their ears. The Cross now gave utterance to sermons against the Reformation until the accession of Elizabeth, who at first prohibited the Paul's Cross sermons, but they were afterwards resumed and continued until the end of Charles I.'s reign. Laud preached there in 1624, and again in 1631.

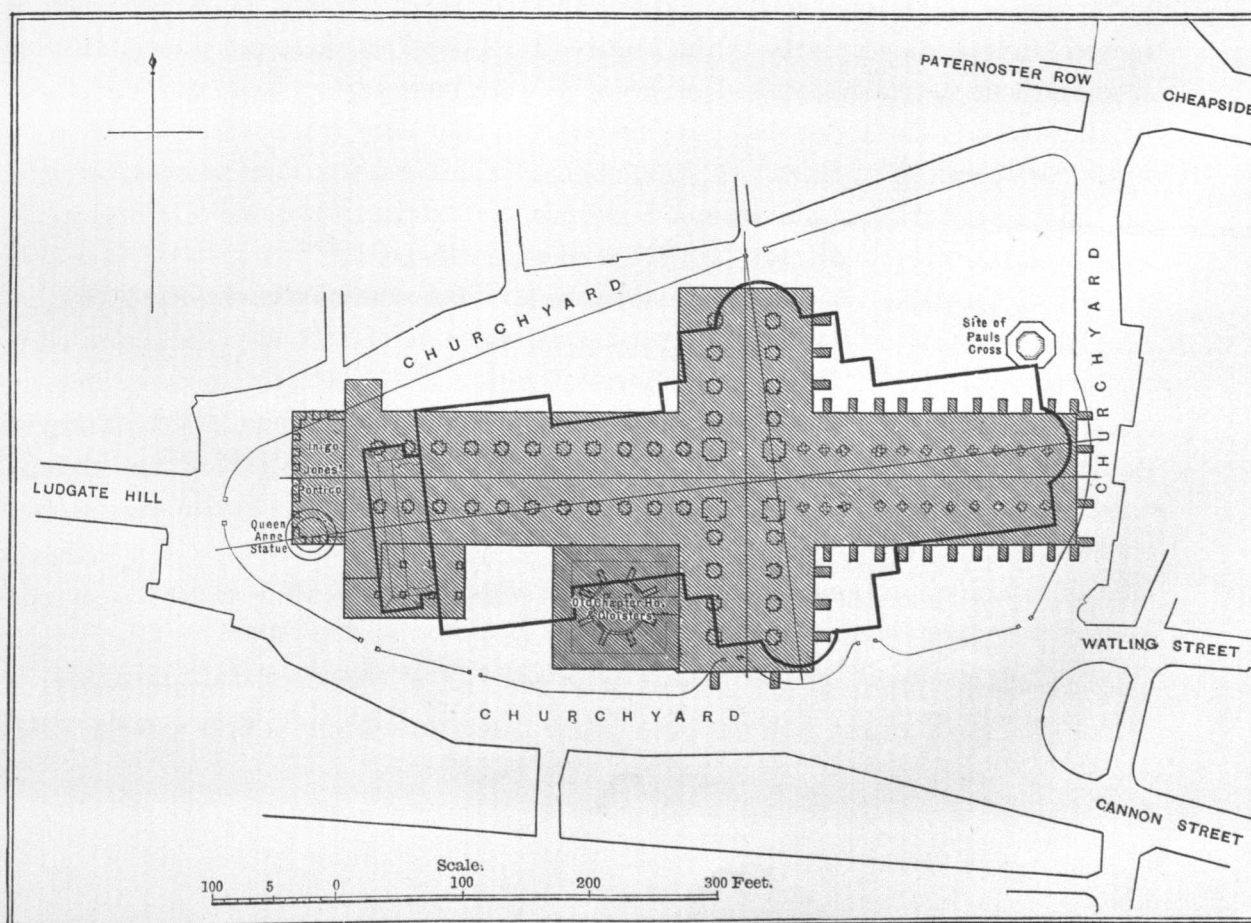
Notwithstanding, however, the aid which it had contributed to the Reformation, the Puritans of the Commonwealth would none of it, and it was levelled to the ground in 1642; that is, to the level at which it has been discovered; and this accounts for its not appearing in Hollar's views or ground plan, who otherwise could hardly have failed to show it, and for the uncertainty which has hitherto prevailed as to its position. The place assigned to it in the Ordnance Survey of London is seventy or eighty feet from that where it was found. Its position is certainly well represented in the Buckler Plan, subject to the very large correction required for the length of the choir as shown in that plan.

The direction of the sides of Paul's Cross were far from being parallel to the assumed axis of the choir following the All Souls Plan,^a and much more

^a Plate XIII. upper plan.



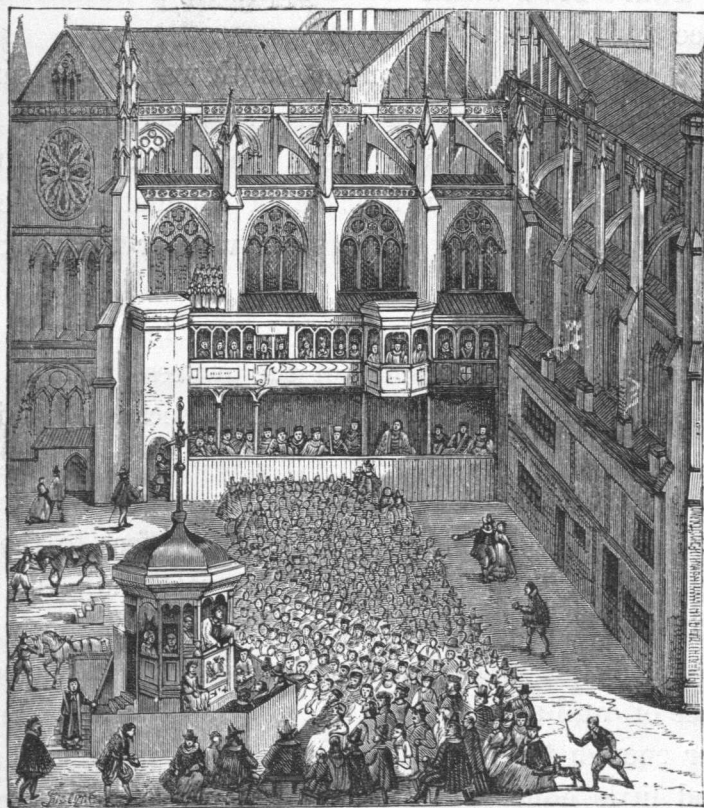
FROM THE PLAN IN THE WREN COLLECTION AT ALL SOULS COLLEGE, OXFORD.



FROM THE PLAN DRAWN BY F. C. PENROSE, SURVEYOR TO THE FABRIC OF ST. PAUL'S, 1879.

THE AXIS AND SITE OF OLD ST. PAUL'S.

corresponding to that of the nave as ascertained from the cloister and transept.^a The plan in question, however, seemed prepared for this contingency, if the expression may be allowed me, because it showed the east wall very far from square with the north and south walls, and thus still seemed to point to a deflected axis, and that the sides of Paul's Cross, namely, those towards the cardinal points, were parallel to and square with the eastern front.



ST. PAUL'S CROSS.

"As it appeared on Sunday, 26th of March, 1620, at which time it was visited by King James I. and his Court, the Lord Mayor and Court of Aldermen being in attendance; when a sermon was preached by Dr. John King, Bishop of London, recommending the speedy reparation of the venerable Cathedral of St. Paul's, which, with its unsteeped tower, &c., appears in the back or side grounds." From an original picture in the possession of the Society of Antiquaries of London, which is engraved in Wilkinson's *Londina Illustrata*, 1811.

There seemed some reason to hope (a hope that has been quite realised) that some remains of the north and south walls, near the east angle, would be found

^a Plate XIII. lower plan.

under the churchyard wall, and from the plans it seemed likely that the east wall itself and its buttresses would be under the street, and therefore be inaccessible.

The first excavation made to find these walls was on the assumed deflected line of the north wall. There we found no remains whatever; but as this point was quite as much within the influence of Sir Christopher Wren's forty foot pit as those portions of Paul's Cross which had disappeared, I was inclined to attribute their non-existence to this cause.

The next search was for the corresponding south wall on the same hypothesis, and the search was rewarded by part of a buttress base. Only a portion of the northern side of the buttress remained, and a search for the southern side was made, but fruitlessly, except to show a piece of foundation which might have belonged either to a return buttress of the south wall or to an extension of the east wall.

The discovery of this buttress, however, gave much information, namely, the character of the staging and bottom splay of the buttress, and the original street level, but it did not solve the question of the axis, because it might either be the southernmost buttress of the eastern front, and as such it agreed well with the All Souls Plan,^a or it might be the buttress responding to the southern arcade. The next trial which was made was twenty feet to the north of this buttress, and we found the outer footings of the east wall, and followed them up northwards, in hopes of finding either a buttress ranging with the former one as the south arcade projection on the theory of the deflected axis, or else such a continuance of wall as to indicate the wide central bay. Before, however, it had reached far enough to clear this up the trace was gone, having been uprooted. As I had little hope of finding anything close to the present Cathedral apse, it seemed best to have an excavation made, about fourteen feet southward of the present, for the south wall of Old St. Paul's, on the hypothesis of a straight line produced from the cloister, and there a wall was found, with some old rough pavement to the south of it, about nine feet below the present surface. The direction of this wall was practically square with the front as derived from the buttress, and also nearly parallel to the cloister wall. It was clearly a thick, strongly-built wall, and of the same coarse oolite as the foundations we had already discovered. The external face, however, seemed too rough for the wall of such a Cathedral, and the level of the upper course which remained was such that the splay which had been found on the buttress ought to have shown itself

^a Plate XIII. upper plan.

upon it if it had been in uninterrupted communication. It still suggested the possibility of its being an adjunct to the Cathedral of some kind, although it certainly turned the scale of probability against the All Souls Plan.^a

It then seemed worth while to try if there might be something under the very apse itself mixed up with the supports of the churchyard wall. And there indeed, much nearer the surface, and more complete in most respects, was a buttress which at once proved itself to be the projection of the northern arcade of an undeflected choir; so that the plan which had previously been in favour had to be dismissed ignominiously. The probability is that the lines of the old Cathedral had been imported into that plan from some imperfect notes or tradition after all trace of it had disappeared. It shows the present Cathedral and the churchyard very accurately, so that it is evident that the data upon which the old Cathedral is laid down could not have been obtained whilst it was in any part standing; in fact, a rough copy of Hollar's plan seems to have been applied to the plan of the newer buildings. We were able to work sufficiently beyond the churchyard wall to obtain a complete plan of the buttress last found, which at once gave the central axis of the choir.

I should have mentioned that, before this excavation had been made, part of the northern buttress of the east wall had been found, but this had not cleared up the question, as it would have fitted the northern arcade buttress on the other theory quite as well. Its great thickness, nearly nine feet (not reckoning foundations), showed, however, a presumable correspondence with the very large buttresses shown at the angles by Hollar, but at that time no evidence had been obtained of the thickness of the intermediate buttresses. When the discovery of the two arcade buttresses had cleared up the question of the axis it seemed desirable to get, if possible, more evidence of this northern buttress, and further search was made, which resulted in finding a great part of it, and also a fragment of the foundation of the buttress which grouped with it on the north wall of the Cathedral and of the rectangular massive quoin which, as often occurs in the best examples, separated these two buttresses from each other. This feature is shown by Hollar in his perspective but not on his plan.

The total external width of the choir, one hundred and two feet clear of the basement, agrees very well with Hollar's plan, but the length is less. In this respect the All Souls Plan^a comes nearer, and it may have followed some correct memorandum as to the amount by which the Cathedral was shortened to improve the width of the street.

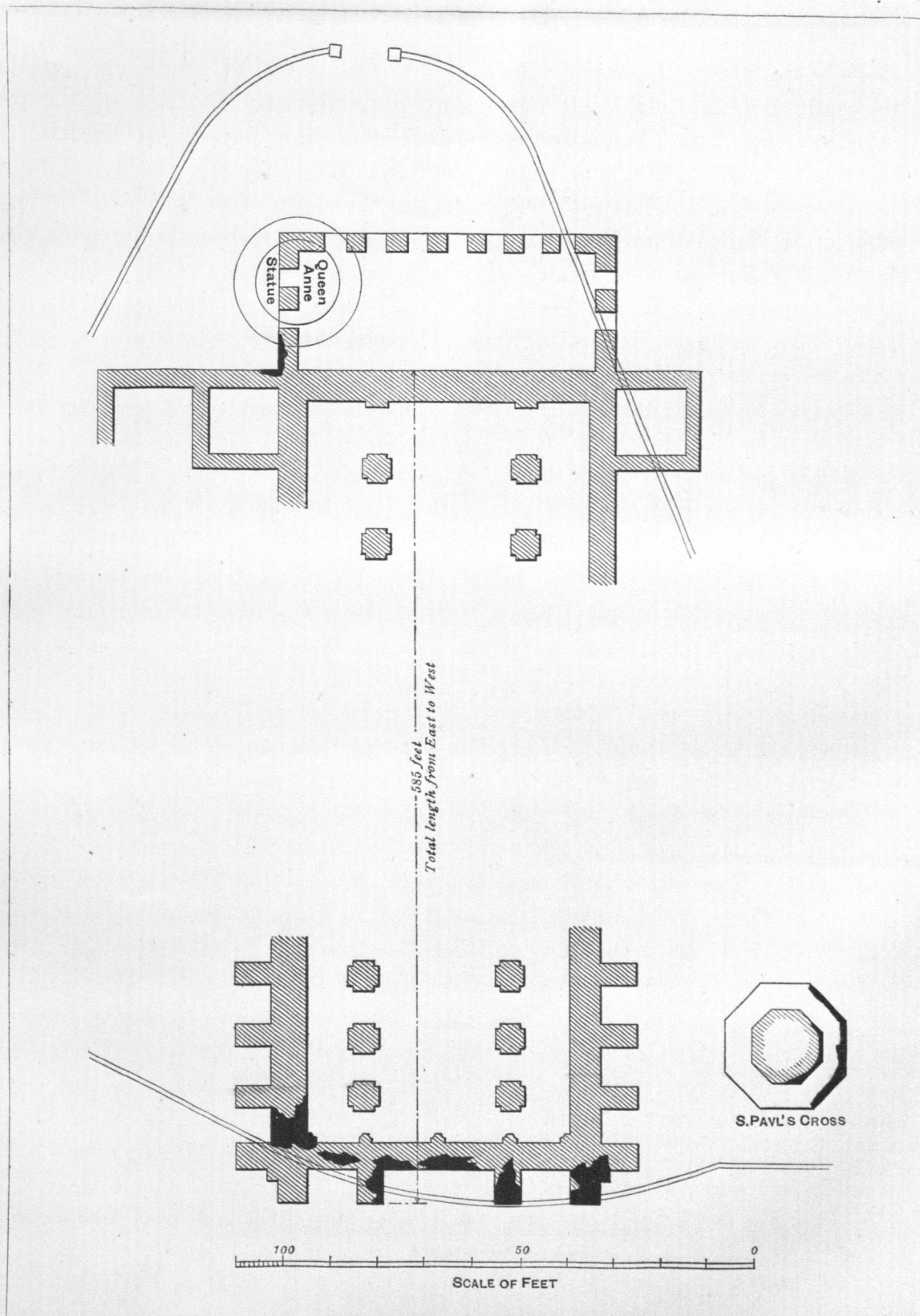
Now that it was established beyond doubt that the wall discovered to the

^a Plate XIII. upper plan.

south of the present Cathedral was the south wall of Old St. Paul's, and also that the position of the east wall was known approximately (no part of the wall itself had been found, but only the footings and some part of the flank of the buttresses), a favourable hope offered itself that the inside face of the wall might be preserved, and possibly some indications of the shafts of the south-east internal angle of St. Faith's Church, the floor of which must have been below the outside pavement which had been found. The discovery, however, which resulted surpassed expectation, for the entire group of shafts, plinth bases and caps (the latter much mutilated, but enough to guide almost exact restoration), were laid open, and a portion of tiled floor. This floor is raised to the top of the original plinth, viz., up to the level of the bases, and belonged either to a platform raised for an altar, or else shows that the floor itself was raised subsequently to its first building to get away from the damp. The architectural features discovered agree almost completely with Hollar's perspective view, except that the shafts are not so high.

The internal diameter of St. Faith's Church (but it should be observed that the extreme east end, although latterly St. Faith's Church, was originally Jesus Chapel) was eighty-five feet six inches. If we restore the plan from Hollar's data, the width from centre to centre of piers of the central part of the choir above would be forty-two feet. If we deduce it from the central distance of the eastern buttresses the width would be forty-two feet five inches. This shows that the choir must have been narrow for its height, whilst the aisles were wide.

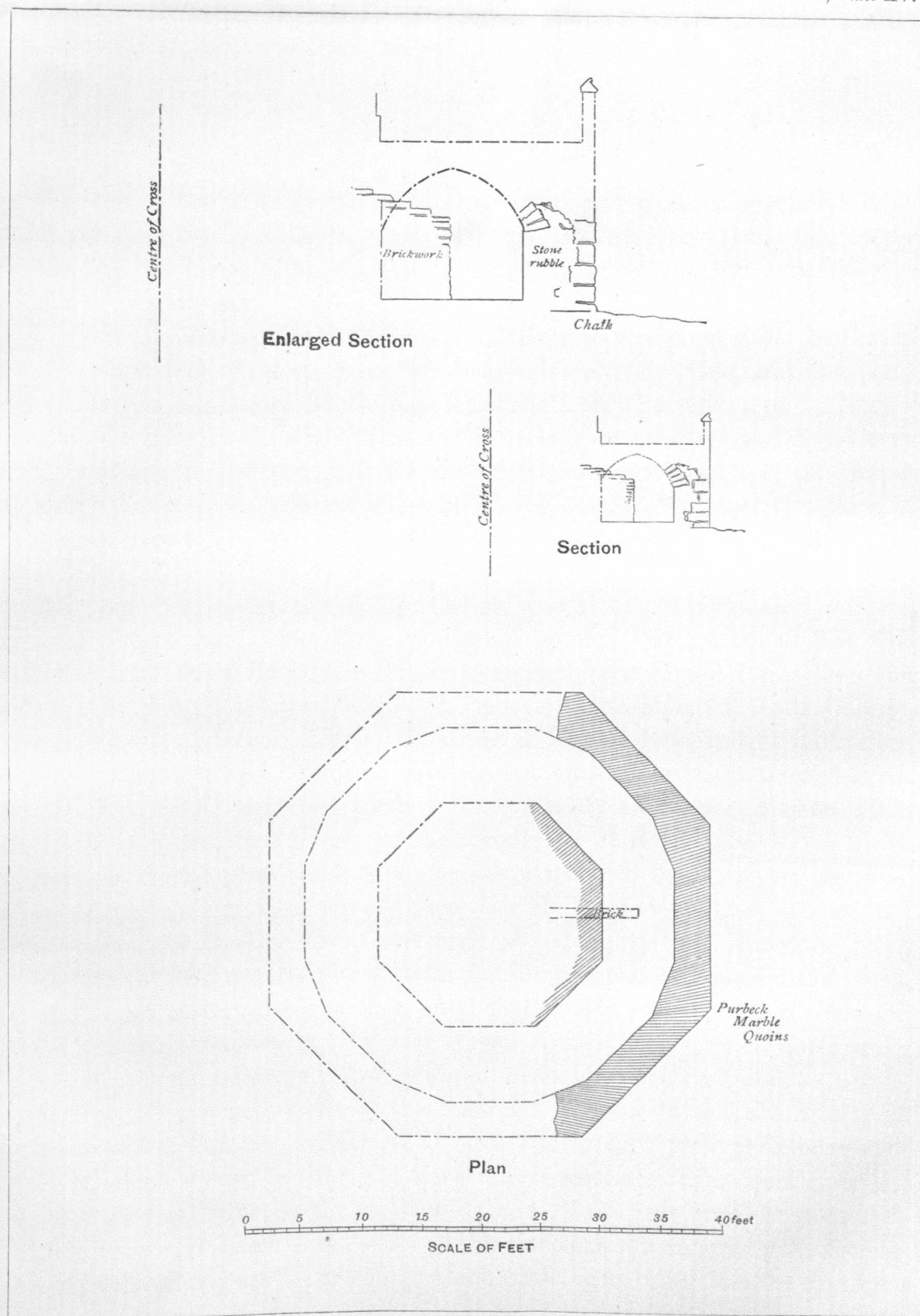
The floor of St. Faith's was four feet below the external pavement which was found on the south side, and about thirteen feet below the present level of the churchyard. The east wall makes an angle of about $6^{\circ} 10'$ with the present Cathedral. The angle obtained from a short length of the south wall is $6^{\circ} 40'$, from Paul's Cross $7^{\circ} 45'$, and that derived from the cloister is $7^{\circ} 18'$. The floor of the cloister is seven feet and a half above that of St. Faith's pavement. The extreme breadth of the transept, omitting the large buttresses shown by Hollar towards the centre of the south transept, was three hundred and three feet. The extreme length, including the eastern buttresses but excluding Inigo Jones's portico, could hardly be less than five hundred and ninety-five feet, and I may in a few days be able to announce this more precisely, because the Dean and Chapter have kindly permitted an excavation to determine this point. I must conclude by also acknowledging the kind co-operation of the City Architect, and of the Committee of the Corporation, in these investigations. It should be stated that means of access to all the important points of evidence have been preserved.



OLD S. PAUL'S.

F. C. Penrose.

FOUNDATIONS AT THE EAST AND WEST ENDS.
Discovered in 1879.



PAUL'S CROSS.

F. C. Penrose.

PLAN AND SECTION OF FOUNDATIONS.
Discovered in 1879.

POSTSCRIPT.

The hope with which the paper concluded has not been disappointed, for a search made for the foundations of the west front towards its south-western corner revealed the line indicated on the plan. The place for making the trial hole was selected in this manner.

The general direction of the south wall of the nave was pointed out by that of the cloister wall as deduced from the discoveries already made, but the point where this line terminated at the west front could only be arrived at by conjecture, and the balance of probabilities, as the various representations differed very widely amongst themselves, and the problem consisted in settling the proper proportion between the unknown length of the nave and that of the parts of the church eastward of the west wall of the transept which had already been discovered.

The plans and perspectives, by Hollar, contained in Dugdale's volume, furnished several data. The large collection by Mr. Crace, which at that time was being exhibited at South Kensington, supplied others, and from these and from the Pepysian Library at Magdalen College, Cambridge, All Souls College, Oxford, and the Guildhall Library, upwards of twenty independent indications of length were obtained. Those *à priori* most entitled to credit, seemed to be, first, Hollar's plan, and then what I have already called the Buckler Plan, but it will be evident that neither of them could be of much value by itself, for in that part of the plan which could be compared with the measured distance, instead of three hundred and twenty-three feet Hollar showed three hundred and forty-two, and the Buckler Plan three hundred and eighty-two. However, when all the different data were arranged, with the weights which seemed due to each, and the result taken with reference to their assumed probabilities, a place was pointed out for examination very near Queen Anne's Statue, where fortunately the pavement could be easily moved without disturbing the rest, and, as I mentioned above, I was authorised by the Dean and Chapter to make a trial. At about twelve feet from the surface we at once came upon a piece of foundation of flintwork, which seemed to belong to the southern return of Inigo Jones's portico, and about six feet further to the eastwards; and fifteen feet from the stone curb of the railing round Queen Anne's Statue this flintwork was crossed by the foundations of a wall running north and south, which could be no other than the west front

of the Cathedral. The ground round about the excavation was so rotten that it would have been impossible without serious damage to the pavement, or great personal risk, to make sufficient clearance to do more than ascertain these facts. The walls here had been much more fully grubbed up than those which we found of the cloister, or of the east end, and there was only just enough left to verify them. There could be, however, no doubt whatever that they were the foundations of important walls. This discovery was made on 7 June, 1879, and it determines the total length, exclusive of the western portico, to have been five hundred and eighty-five feet.

[The Society of Antiquaries begs to thank Messrs. Longman for their courtesy in permitting the use of two plates which illustrate the "History of St. Paul's," by its late lamented Fellow, William Longman, Esq.—namely, "St. Paul's Cross," on page 20, and "Projection of Old upon New St. Paul's," facing page 125, of that work. The former plate has been directly used, the latter has been adapted for comparison with Mr. Penrose's latest plan, Plate XIII. lower plan.—H.S.M.]
