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NOTES ON CIRCULAR CHURCHES.

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It is not my intention to offer any opinion or theory with regard to certain ecclesiastical buildings of circular form, but merely to give a slight architectural notice of a few that I have had an opportunity of visiting. Circular churches, or churches arranged according to a circular ground plan, appear to be found, though often at wide intervals, in most parts of Europe, and to belong to various periods, commencing with the earliest ages of Christian architecture. Sometimes, as at Aix, in Provence, and at Frejus, they are attached as chapels to larger churches, and they are used as baptisteries, or at least retain the name. Sometimes they are insulated, the circular fabric being at a short distance from some church, to which it appears to belong, as S. Costanza, at Rome, which stands near the church of S. Agnese; and in some cases they seem altogether independent, as in the well-known English examples, each of which forms as it were the nucleus of a larger church of a later period. Almost every continental specimen is considered by the inhabitants of the place to have been a heathen temple; and, though in each particular instance it might seem needless to refute the supposition, yet the universality of the tradition might render it worth the notice of the antiquary. And, if it is necessary to look for the derivation of so simple a form, there is no doubt that, like the rectangular plan, it can be traced to the days of Paganism. I have defined circular churches, as churches arranged according to a circular plan; for this definition will include those whose horizontal section

is a polygon, which may be described within a circle, a form perhaps more common than that in which the actual curvature appears. And it will be correct, as applicable to the general arrangement, notwithstanding the additions and excrescences which we shall have to notice, and without which there is hardly a mediæval specimen to be found.

There may be said to be three different types of round churches.

First, those of a simple circular or polygonal plan, without recesses, except an apse or porch. Such is the ruined chapel in Ludlow castle; and the building called the baptistery at Canterbury cathedral belongs also to this class. The chapel at Altenfurt, near Nuremberg, is a good example. It is very small, very simple, and, according to local tradition, very old. As far as its architecture is concerned it may be of any date, from the time of Charlemagne to the twelfth century.



Altenfurt.

Its ground plan is a circle, to which is attached an eastern apse. The diameter internally is not more than 20 ft., and the wall is about 3 ft. 9 in. in thickness. The roof is domed, and the only ornament inside is a plain string at the junction of the dome with the wall. The chancel arch, as well as the western door, is quite plain, but the former seems to have been enlarged. Externally there is a corbel table with small round arches under the cornice, such as

occurs generally in Romanesque work. It is probable that the external roof nearly coincided with the dome; this is now covered with a high wooden roof, finished with a modern belfry of the same material. There is no church near this chapel, which stands in a forest, and is within an hour's drive from Nuremberg in the direction of Ratisbon.

I have elsewhere noticed a small round chapel near Maintenon, on the line of railroad between Paris and Chartres.¹ This is also a simple circle, with an apse attached to the eastward. The dome, if it ever had any, is destroyed, and replaced by a wooden ceiling.

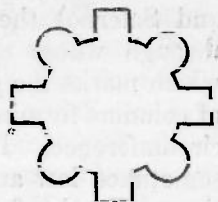
The round church at Grasse, near the southern coast of

¹ Architectural Studies in France, by the Rev. J. L. Petit, London, 1854, p. 14,

where a representation of the circular chapel at Maintenon will be found.

France, seems to be of this description. It is now used as a powder magazine, and I had not an opportunity of seeing the inside. I was told that it is quite plain, without any columns. It is possible, however, that an inner circle may have been destroyed, for the sake of adapting the building to its present purpose. This chapel also has an eastern apse.

The second typical form is that which has the circular or polygonal plan with radiating recesses, either rectangular or apsidal. This form is found in ancient temples, tombs, and baths. There is a good specimen of the latter type among the remains at Pompeii, a circular, or rather elliptical, room, domed, and with three domical niches set cardinally, the fourth opening being the entrance. A little temple, or tomb, whichever it may be, at Tivoli, is much of the same form. But the best known ancient example, as well as the finest, is the temple of Minerva Medica, at Rome, in which the radiating recesses give great character to the external as well as the internal aspect of the building. In this, they occupy the sides of a decagon. Perhaps no form is more suggestive of architectural beauty and grandeur, or could be better carried out in buildings on a large scale. Michael Angelo adopted it in his design for the Florentine church, which, had it been built, would have been one of the finest of his architectural works. In this design the radiating chapels or recesses, including the entrance, are eight in number, and are alternately apsidal and rectangular, an arrangement that we find in the beautiful baptistery at Albenga, on the road between Genoa and Nice, a building evidently of great antiquity and worthy of careful study. The baptisteries at Novara in Lombardy, and Frejus in the south of France, have the same alternation of rectangular and semi-circular recesses.



The third typical form is that which presents a circular or polygonal centre, supported by piers, and surrounded by an aisle of corresponding form. This is the plan of our four English examples, and may, generally speaking, be considered as the typical form of round churches of any size or note. The addition of the porch or chancel is still usual; and several variations occur which give to the individual

church its own distinctive character. For instance the aisle may be repeated, as at St. Stefano, in Rome, and the very curious church of Charroux, in Poitou, now unfortunately reduced to a central tower. The outer aisle may also have its radiating recesses, as in S. Costanza, at Rome. S. Vitale, in Ravenna, has a sort of open apse on slender columns attached to each arch of the central octagon (except those of the chancel and western entrance), projecting into the surrounding aisle. The form of the piers also varies. In S. Costanza and the baptistery of Nocera (between Naples and Salerno) they consist of a pair of columns, the line through whose centres passes through that of the circle which marks the general ground-plan. In Bologna the pair of columns forming the pier stands in the direction of the circumference. In other cases the single column is used, sometimes low and massive, sometimes of classical proportion. We also find what might be called the mural pier, or the part which would be left if the wall of the central circle or octagon were built up solidly from the ground, and then pierced by arches opening into the aisle. At S. Vitale a singular and somewhat ungraceful pier is used. In S. Stefano, which I have already mentioned, the central part rests on columns with an entablature instead of arches, as does the clerestory in several Roman churches of the rectangular basilican form. There is also much variety in the arrangement of the upper part, above the piers and arches. Sometimes we find merely the dome, and that not pierced for light: as in the chapel of Riez, supposing the present arrangement to indicate its original form; sometimes we have a clerestory with windows, as in S. Costanza and other Italian examples, and sometimes the complete system of pier arch, triforium, and clerestory, as in S. Vitale and the church at Nimeguen.

Some buildings which belong to the class of round churches may be considered as anomalous, from the introduction of the square plan. Such is the very curious specimen at Quimperlé, in Brittany, which has a square tower supported on massive piers and arches, surrounded by a circular aisle, to which are attached nave, chancel, and transept.

There is another class of buildings which we must not confound with circular churches, though they bear so strong an

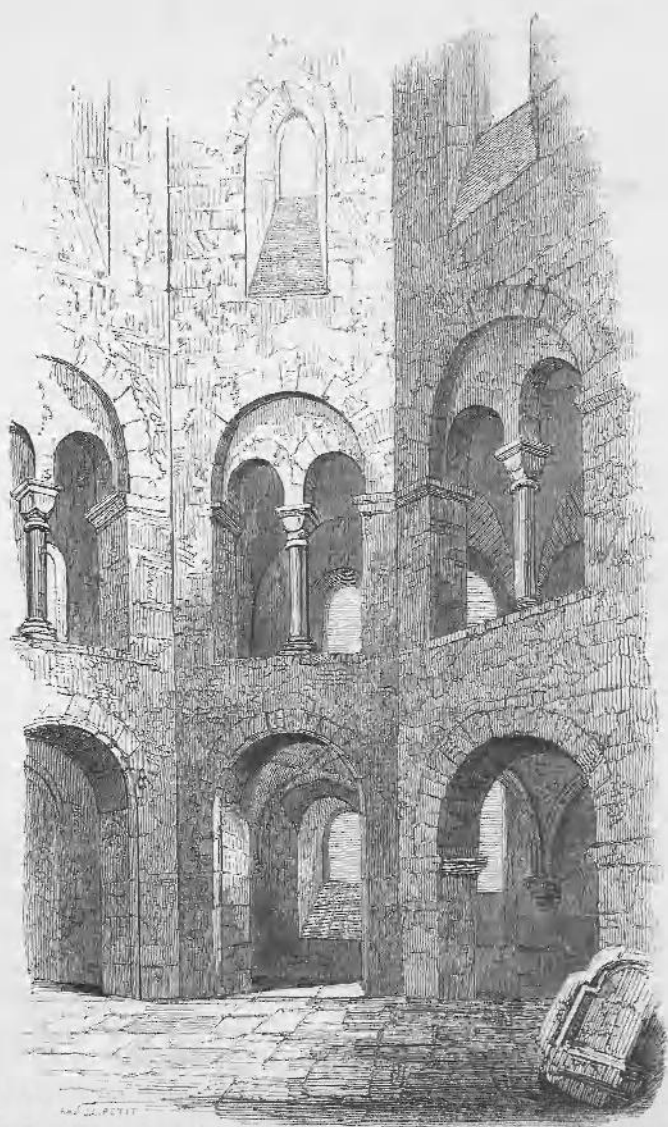
analogy to them, and seem so frequently to have been erected for the same purposes, namely as baptisteries, or sepulchral chapels, that we cannot altogether omit them, if we would enter fully into the subject. I mean those in which the square is used instead of the polygon, and small apsidal recesses are attached to the sides. The baptistery at Ratisbon is a beautiful, though small example : we may mention also the chapel of S. Croix at Montmajour near Arles, and that of S. Sepulchre at Peyrolles, near Aix in Provence. The difference between the polygonal or circular and the square form is an important one as regards construction. For if the circular or polygonal form of dome is used, the round chapel (as we have defined it), has no need of pendentives, as it forms in itself a drum on which the dome may rest. Even such pendentives as are employed when a circular dome is set upon an octagonal drum are not necessary so much for support as for adaptation. But if the polygonal or circular drum be set upon a square, as at Ratisbon, some kind of pendentive is absolutely necessary, and its introduction gives altogether a new character to the building. We often hear the church of S. Sophia in Constantinople and that of S. Vitale in Ravenna spoken of as similar in their character. This is calculated to create confusion of ideas, for constructively no two buildings can be more dissimilar, the one having the dome supported on piers and arches arranged so as to be equivalent to an unbroken circular wall, the other, S. Sophia, forming a support for the dome at a distance from the angles of the square, by means of enormous pendentives of very ingenious construction, corresponding in their surface to a spherical dome much larger than that which stands upon them. The other two examples I mentioned are roofed in such a manner as not to require the pendentive, the chapel at Montmajour having a four-sided dome of a square horizontal section, and that of Peyrolles has a plain barrel vault.

The chapel at Nimeguen, to which we have already alluded, is noticed by Mr. Fergusson, and a section and elevation of the building, as in its original state, are given in his Handbook. No doubt this is a correct restoration ; but the edifice evidently underwent an extensive repair in the fourteenth or fifteenth century. The exterior in fact shows very little Romanesque work, most of the windows being

Gothicised, and a great part of the old stone facing replaced with brickwork. I think the central octagon must have been somewhat raised, as its lower part shows a good deal of the old stonework, while the upper part is entirely brick. In the interior the original work is less altered." The central octagon is supported by eight low round arches, of a single square order, perfectly plain, the spring of the arch being marked by a simple string or bracket under the soffit. In some of the arches this has been cut away, and the arch itself slightly enlarged. Above is a large triforium, the dimensions of its main arch being about equal to those of the pier arch. This is subdivided into two smaller arches by a shaft with a plain cushion capital. The vaulting of the triforium is original, but evidently of late twelfth century work. The corresponding vault of the aisle below is Gothic, and chiefly constructed of brick, or at least faced and finished with that material. Both the lower and the triforial aisle are lighted by windows. The clerestory has at present plain pointed windows. The dome appears to have been destroyed; if it still exists, it is hidden by a wooden ceiling, but I should say that the spring of the original dome must have been as low as the base of the present clerestory range. There is no eastern projecting apse, but to the westward is a porch in two stories, one corresponding with each stage of the aisle. The lower part has a round barrel roof, and exhibits no decided architectural features.

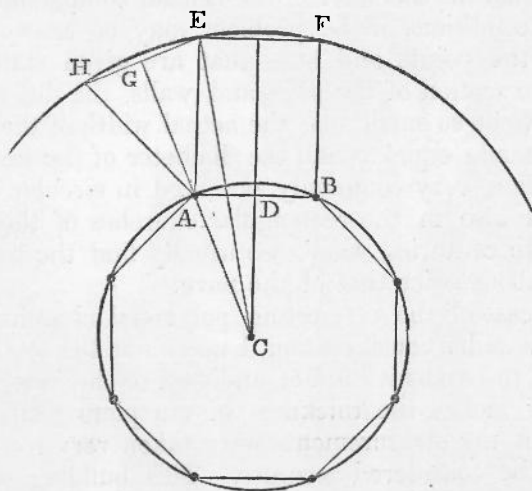
That the upper stages of this church contain nothing earlier than the twelfth century is very evident, but it seems not impossible that the lower part may have some older work. It is true that plainness or even rudeness is not always a sign of antiquity; but in this case the identity of the plan with that of the older portion of the cathedral of Aix la Chapelle, also given by Mr. Fergusson, which is of undoubted antiquity, almost seems to point to some earlier date than that indicated by the triforium. I am supposing the plan of Aix la Chapelle to be unchanged, but I have not seen the church very lately, and I never paid much attention to the peculiarities of its ground-plan. That of Nimeguen is rather a remarkable one, and shows no small artistic skill in its design. The central portion, as we have remarked, is octagonal; the plan of the aisle surrounding it is a regular figure of sixteen sides, each equal, or nearly so, to that of

EXAMPLES OF CIRCULAR CHURCHES.



Nimeguen, in the Netherlands.

the octagon, with whose sides eight of the sides of the aisle correspond, the others answering to the angles. Consequently each arch of the central portion opens into a rectangular compartment, which is covered with the ordinary cross vault, and between the angles of the octagon and the remaining sides of the outer polygon triangles are left, which are covered with a vaulting of their own. I can best explain the principle of the design by a diagram, in which I will represent the piers and walls by points and lines, without taking into consideration their thickness.



Let AB represent one side of the central octagon, A and B giving the position of two of its piers, and let C be the centre of its circumscribing circle. Then if we bisect AB in D , and draw the straight line CD , and take a straight line AE parallel to CD , and equal to the radius AC , by joining C and E we obtain the radius of a circle HEF , which will circumscribe a polygon of sixteen sides, each of them equal to a side of the octagon AB , with which the side EF corresponds, forming the opposite side of a rectangular compartment. For if AH be drawn parallel to a line at right angles to the adjacent side of the octagon, the line EH will be the side of the polygon adjacent to EF , and corresponding with the angle A of the octagon. If we produce CA till it meets EH in G , we see at once from the similarity and equality of the triangles GAE and DCA , that EG is equal to AD , and con-

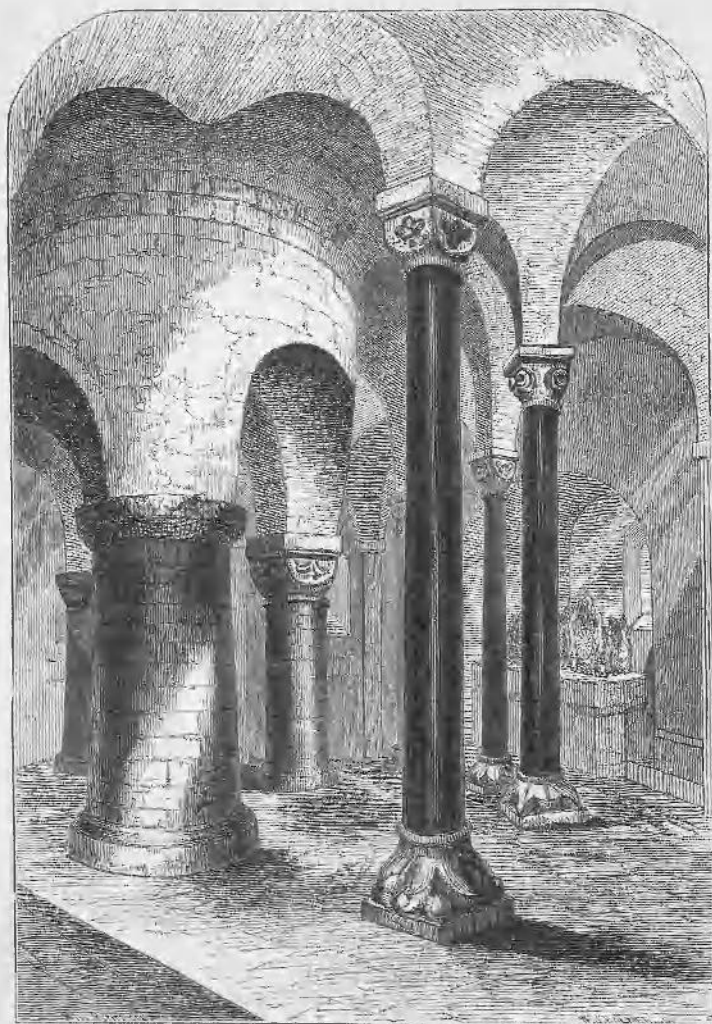
sequently EH is equal to AB , and therefore to EF . And as the same construction applies to all the other sides and angles of the octagon, we obtain a regular polygon of sixteen sides, which will represent the outer or aisle wall of the building.

The ratio between the diameters of the outer and inner circles may be given in the terms of a constant angle, namely the fourth of a quadrant, and therefore may be expressed numerically. It will be perceived that the radius of the larger circle is a little less than twice that of the smaller one; or the aisle, according to the diagram, a little less than half the diameter of the central compartment; but, since the conditions of the problem may be answered practically if the points and lines that are given stand in any part of the section of the piers and walls, the difference will be found to be so small, that the actual width of the aisle can easily be made equal to half the diameter of the inner circle, a proportion very commonly observed in circular churches, as it was also in the rectangular churches of the eleventh and twelfth centuries, where we usually find the total width equal to about twice that of the nave.

In the case of the interesting polygonal church at Nimeguen, now under consideration, I made out the total breadth internally to be about 39 feet, and that of the inner octagon, 18 feet 6 inches, the thickness of the piers being 2 feet 4 inches, but my measurements were taken very roughly, and must not be considered accurate. This building occupies a commanding position on a high bank sloping to the river (a branch of the Rhine), but unfortunately is so surrounded by trees, that it is difficult to make a sketch of it externally, unless in the winter. The antiquary will, however, find it in good condition, well preserved, and not spoiled by modern restorations. At a short distance are the remains of a church terminating in an apse. As Nimeguen is within a drive of two hours from Arnheim, through which a railroad passes from Dusseldorf and Cologne, this specimen is easily visited.

A few miles to the south of Soest, in Westphalia, a town through which a railroad passes, and containing objects of interest to the antiquary, is the small but very curious chapel of Drüggele. (See cut, p. 115.) It presents externally the appearance of a polygon of twelve sides, with an eastern apse and southern porch. The outer roof is of wood, of modern date,

EXAMPLES OF CIRCULAR CHURCHES.



Druggelte, near Soest, in Westphalia,

EXAMPLES OF CIRCULAR CHURCHES.

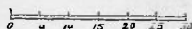


Fulda.

In Hesse Cassel, Germany.

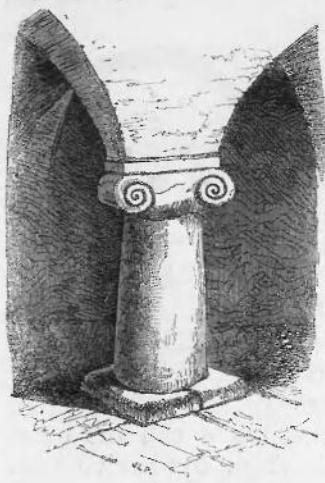
crowned with a cupola of the same material. Internally we find a much more complicated system of construction than the simplicity of the exterior leads us to expect. In the central part four unequal columns support, upon arches, a small dome. These arches, however, do not, as at Quimperlé, occupy the sides of a square, but are cut out of a cylindrical drum, and consequently have a very considerable double curvature, and support the dome without the intervention of pendentives. Two of the columns are very massive, and have no capital, except a plain impost moulding. The other two are slighter, and have rich capitals with the square abacus. The space between this inner circle and the outer wall is divided into two concentric rings by twelve very slender columns, taller than the central ones, and ornamented with rich and varied capitals. The roof connecting this with the inner circle is a round barrel vault. The arches between the last-mentioned columns rather encroach on this vault, and being round-headed, exhibit a double curvature in that direction, but towards the wall they occupy a plane surface, the vaulting being cellular. The whole plan is internally as well as externally a polygon of twelve sides. Although the enrichment presents much delicate work, the general plan is carried out with no great regularity. The total width internally is about 32 feet; but my plan must be taken as a rough one. There is no neighbouring church to which this chapel could have been attached.

The circular church at Fulda, in Germany, stands at a short distance from the modern cathedral, which occupies the site of an older edifice; but from the nature of the ground there could hardly have been any connection between the two buildings, and we must, I think, count this round church among those that are independent of any other. It has been lately restored, and its interior disfigured by painting; but as far as its important features are concerned it seems unaltered. The present building dates from the eleventh century, but it stands over a circular crypt of much greater antiquity, which is surrounded by a very low, narrow



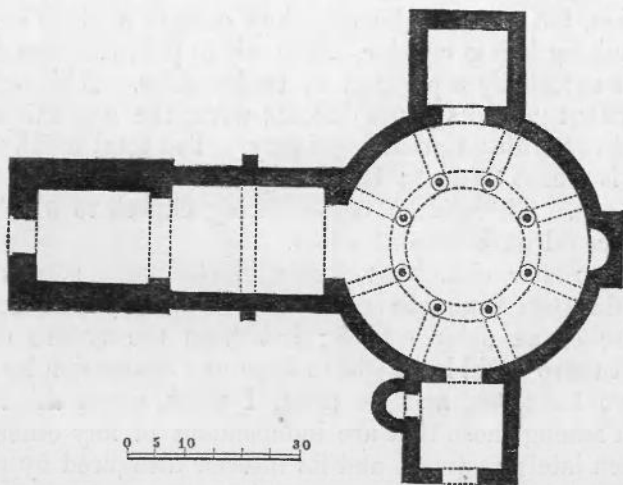
Drüggelte

and irregular passage (it can hardly be called an aisle) outside the wall of its central compartment. The vaulting of this cen-



Interior View and Plan of the Crypt, Fulda.

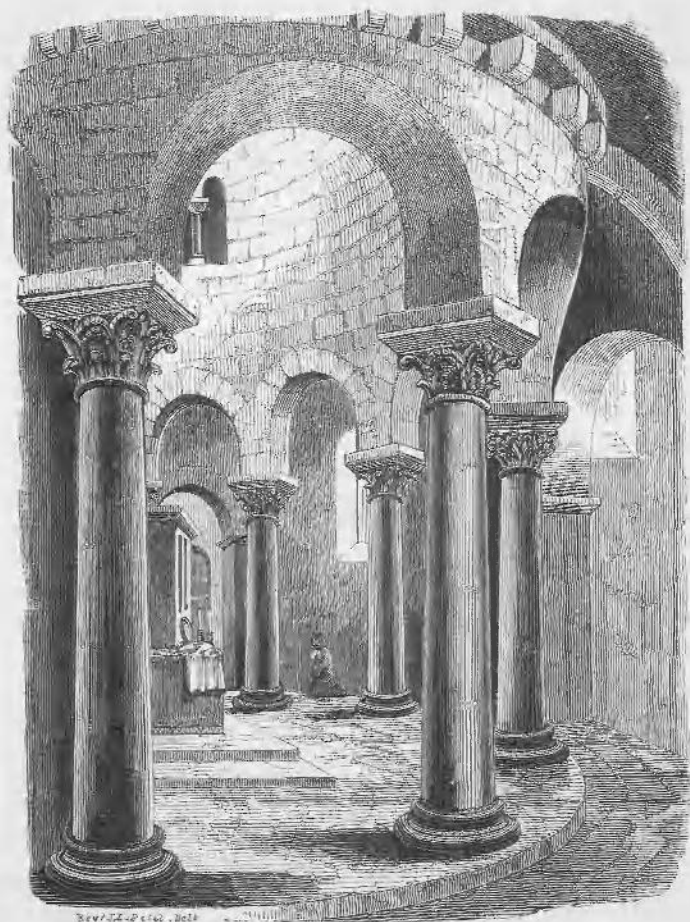
tral portion rests on a low heavy column with a sort of rude imitation of an Ionic capital. (See woodcut.) The church above



Plan of the Church at Fulda.

has a circle of eight columns of nearly classical proportion, with rich capitals and the square abacus. From these spring

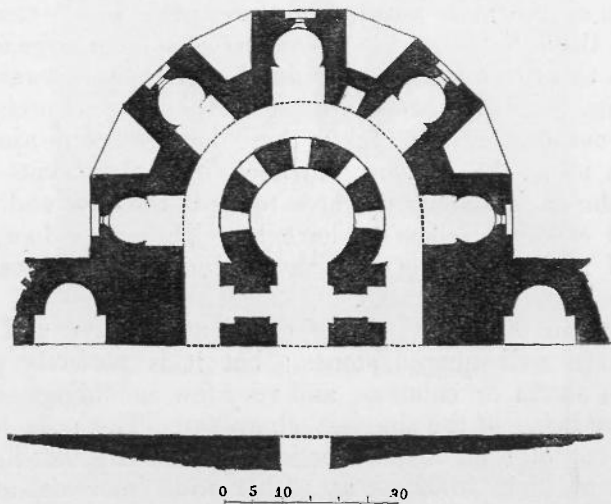
EXAMPLES OF CIRCULAR CHURCHES.



Fulda, in Hesse Cassel.

round arches which have a double curvature, the plan being circular, and not polygonal. Above is a small triforium and clerestory. The roof at present has a vaulting of convergent cells. This compartment is surrounded by an aisle, also circular in its plan, but having a recess at the east end, and transepts and nave, which give the building the outline of a cross church of the usual form. To the westward is a square tower not exceeding in height the round tower in the centre, which latter is crowned with a lofty wooden spire. There does not appear to be any difference of date between the circular and rectangular portions of this church, which, however, probably replaced an older building of a more purely circular form. Fulda, though evidently a town of some importance, does not stand very near any line of railroad. I went to it from a station on the line between Eisenach and Nuremberg, and found it a good day's journey, but it may perhaps be more conveniently visited from Frankfort, by way of Gelnhausen.

Mr. Fergusson has shown the development of the circular church into the apsidal termination, comprising a semicircular or polygonal aisle with radiating chapels, which became



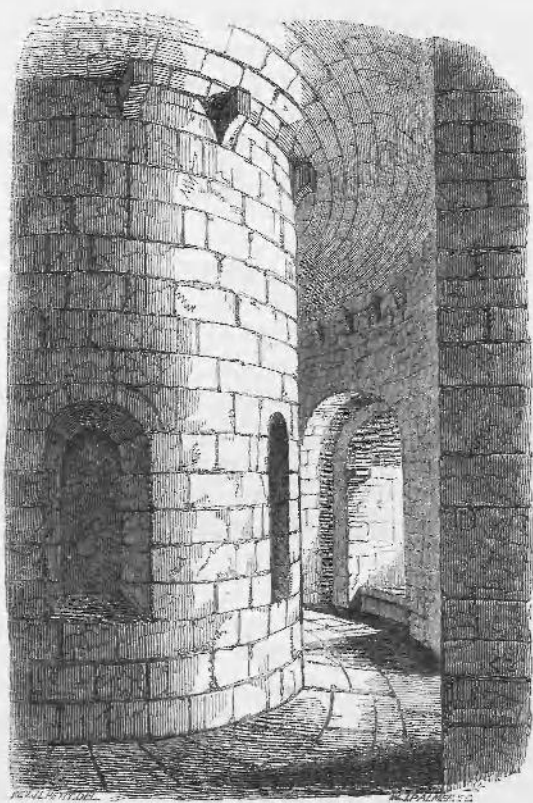
Plan of the Crypt at Montmajour.

nearly universal in French cathedrals. The instances he gives of a transitional state can now, unfortunately, be studied

only from drawings or engravings ; but there still exists an example of a similar arrangement in the crypt beneath the abbey church of Montmajour, near Arles. This will be better understood by referring to the plan I have made out, which, though not minutely exact in all its measurements, may be depended upon as sufficiently correct in all essential points. The chapel consists of a circular building about 16 feet in diameter, supporting a dome. It is entered from the westward by an arch about 8 feet in span, set in a flat wall, so as to avoid any double curvature. This of course cuts off a considerable part of the circumference, but leaves much more than the mere semicircle which would form an apse. An aisle about six feet wide runs partly round, forming a semicircle round the eastern part, and continued to the westward in straight lines ; in fact taking the form of the apse of the church above. From this aisle branch out five apsidal recesses, namely to the north, north-east, east, south-east, and south. They are lighted by small round-headed windows, one at the end of each recess. A window or arched opening, not reaching to the ground, in the central portion, corresponds with each of these apses. The outer wall, which is externally polygonal, is of great thickness, the apsidal recesses of the aisle not forming any projection externally beyond the surface, but the spaces between have large arches sunk in them to a considerable depth. To the westward the crypt has transepts, beneath those of the upper church, and partly cut out in the rock ; these have eastern apses, a passage also—the present entrance into the crypt—runs under the nave, sloping upwards towards the west end. The original entrance seems to have been through a door, now blocked up, situated between the eastern and south-eastern recesses of the apsidal aisle.

The whole of this crypt is of excellent masonry, and built with large well-squared stones ; but it is perfectly plain, with no shafts or columnus, and very few mouldings—what there are being of the simplest character. The aisle has a barrel roof of semicircular section, without ribs, but having a series of plain brackets, at rather wide intervals, at the spring, which is not masked by any important moulding. The central dome is carried up to some height with not much deflection from the vertical line, and with smooth masonry ; it is then abruptly flattened, and consists of courses of stone

overlapping each other. This is probably where it is stopped by the floor of the church, and the circumstance must be taken into consideration if we inquire into the relative dates of the upper and lower churches, and their connection with each other. In Murray's Hand-Book the crypt is said to belong to the eleventh century, but whether the supposition is grounded on records or on architectural style, I do not



Interior View of the Crypt, Montmajour.

know. It is not unlikely to be correct, though there was much in the general appearance of the building that would have induced me to fix on a later period, while, on the other hand, there are circumstances which seem to point to an early date. I should suppose that the church was built about the middle of the twelfth century, and at the first glance I was disposed to look upon the crypt as of the same date, or only

earlier as being necessarily the first part of the design, including crypt and church, that was carried out. But, on comparing my measurements together, I found I had made out the apsidal aisle of the crypt to be wider by one foot than the apse of the church above. Of course I took it for granted that I had been inaccurate in my measuring, and that the walls would be found to be in the same vertical line, and had I come away without paying another visit to Montmajour, I should have thought no more about it.

As, however, I had to pass the place in another of my excursions from Arles, I determined to try again, and this time found the difference still greater than I had made it before, and in favour of the apsidal aisle. Consequently the wall of the upper apse must overhang that of the lower one corresponding to it several inches. Now it is true that this does not affect the stability of the upper structure, for with such walls and such a vault below, the architect might choose his own ground, and place the foundation of his wall where he pleased; still, if he designed one wall as a support to another of any size or weight, he would surely take care that the upper wall should rest altogether upon the lower one, unless a good reason existed for altering the dimensions of the areas by bracketting. The architect, finding such a structure as this crypt, might unhesitatingly build upon it with but little reference to the position of its walls, but if he designed the whole, he would be careful that not even so slight a discrepancy should occur. I need not say that had the upper apse been wider than the interior of the crypt, including its apsidal aisle, the difference would have been in the right direction, and it is what we should have expected. I must confess this apparently trifling circumstance altered my views altogether, and made me look upon the design of the crypt as independent of the present church; it may, however, have been the intention of the builders to place a church above it. The arrangement of the central part is altogether different from that which is usual when merely the floor above has to be supported, a range or two of slender columns connected by vaulting being generally employed for that purpose; for the apse above is a wide one without any aisle, semi-circular within, but polygonal externally, and, what is curious, having an angle instead of a face in the centre

of the east end. It seems not impossible that the dome of the crypt was intended to be of greater height, and perhaps so completed, but reduced to its present dimensions on account of the floor above. The whole church and the monastic buildings connected with it will repay a careful examination, and they present some curious features, owing to the rocky and uneven nature of the ground.

I hope on a future occasion to be able to extend these remarks, and to give a fuller description of some of the examples to which I have only alluded.



Exterior View of the Circular Church at Drüggelte, in Westphalia. See p. 106.

The Central Committee desire to express, with much gratification, the kind liberality of Mr. Petit, in presenting to the Institute the illustrations by which this Memoir is accompanied.