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PRIMITIVE SUNDIALS ON WEST SUSSEX CHURCHES.

BY H. MICHELL WHITLEY.

On many of the old parish churches of Sussex, as in other Counties, are to be found primitive sundials cut generally on the quoins and jambs of windows and doors.

These primitive dials are known as scratch dials from being in many cases lightly incised, and their origin and use has given rise to many theories which it is not necessary to discuss here as it is now generally accepted they were used to tell the hours for the services as well as indicating time.

These dials differ from the more modern true sundial, firstly, in being cut on the stones of the church itself instead of on a plate set to face due south to allow for the variation of the church from due east and west, and secondly the style or gnomon is inserted at a right angle and not sloping at an angle which varies according to the latitude of the place.

These dials also never have figures to denote the time until the XVIth and XVIIth centuries.

There has thus been in historic times a mode of marking time and services. First, the Saxon dials, which went out of use at the time of the Norman Conquest, then the scratch dial, which continued until the XVIth century, when the sloping style came into use, being succeeded by the modern scientific dial, two good examples of which can be seen on Chichester Cathedral.

The introduction of clocks in large churches and monasteries took place in the XIIIth century, and they were fairly general in such buildings in the early part of the next, and for many years they have

become general in our churches. Reverting now to the Saxon dials, the most noteworthy is a superb example on the south porch of Kirkdale Church, Yorkshire, the inscription on which fixes the date between 1063 and 1065; the day being divided into tides. The inscription reads as follows: "Orm, the son of Gamel, bought St. Gregory's Minster, when it was all broken and fallen down, and he caused it to be made new from the ground to Christ and Saint Gregory in the days of Edward the King, and Tosti the Earl.

This is the days' sun mark
At every tide,
And Hawarth wrought me
And Brand, the Priest."

In Sussex we have a fine example of a Saxon dial on the south porch of Bishopstone Church. The stone on which it is cut has a rounded top, with a Greek fret border. The dial is 10in. in diameter. There are five main rays, which divide the day into four parts, these have a cross bar on the circle and project lin. beyond, ending in a dot; each part is sub-divided into three by plain lines, thus having the octave as well as the twelve hour system combined. Above the dial is the name Eadric, possibly that of the maker.

It shows prominently five of the seven great canonical divisions of the day: Matins, Nones, Sext, Tierce and Vespers; each of the intervening spaces being again sub-divided into three hours, making up the twelve hours from 6 a.m. to 6 p.m. This dial dates from the XIth century.

The normal position for a dial to serve any useful purpose will, of course, be facing the sun on the south wall of the building, and although some dials are to be found on the north, they are generally cut on stones which have been removed from their original positions, and rebuilt during an enlargement of the church.

If there is a priest's door or low side window in the chancel the most likely spot to find a dial will be on one of these, sometimes on both; next one of the jambs of the south door of the church is the most favourite spot, and in some churches the southern quoin stones of the nave or chancel bear these markings.

On many churches there are several dials; some of these may be accounted for by alterations in the building, and others are copies which served no useful purpose. The gnomon or style that cast the shadow was a peg fixed at right angles to the face of the dial, none of these styles are now intact, but several of the shanks are still in their holes. These styles were usually of latten or wood, and a fragment of one of the former is still in its hole at Bottolphs Church; the oak style pegs have mainly decayed away, but portions have been extracted in several instances. These ecclesiastical dials would serve roughly to indicate the hours for the church services.

In the earlier dials it will be seen that the rays do not indicate the whole of the hours from 6 a.m. to 6 p.m., only a few being cut.

The noon line is marked on practically every dial, and between 6 a.m. and noon is another line corresponding with about 9 a.m. This was the usual hour for mass on Sundays and Holidays in English parish churches in pre-reformation days. Another line is found between two and three o'clock, the usual time for vespers, no doubt, however, earlier in winter than in summer. The dials at Coombes are a good example of this system of marking. The only useful lines on a dial are those below the horizontal line through the stylehole, some dials, however, consist of a complete circle with radial lines above the style as well as below, forming a wheel dial. This form is often met with; possibly the superfluous lines were added to make a symmetrical pattern.

Another type of dial is that on which small pits are used, either in conjunction with radial lines as at Climping, or without, as at Ford.

It is thought by some archaeologists that wooden pegs were inserted in these holes as on the primitive shepherds' dials which were in use on the Southdowns, before cheap watches became general; this might have been so in some cases, but the pits on the Sussex dials are not deep enough to hold pegs, whilst the hole itself is a sufficient mark.

For this paper the majority of the churches between the Southdowns and the sea have been examined, and a large number of them measured and drawn, but the majority do not now possess any primitive dials, those comprised in the following list being all that were noted.

The addition in later times of aisles to nave and chancel and other alterations caused the removal of the earlier work; some of these incised stones were again used sometimes reversed in the new work.

The drastic restorations of the last century, and retooling face masonry are another cause of the loss of these primitive dials, large numbers having been destroyed throughout the country, and those left are worth saving and protecting as memorials of village life in England in past centuries.

RAPE OF BRAMBER.

EDBURTON CHURCH.

1. There is dial mark on the lowest of the stones of the western jamb of the low side window in the north wall of the chancel; it is 6ins. in diameter, and the rays when in its original position are in the lower quadrant between 6 a.m. and noon; it has been removed from a south wall of the church.

COOMBES CHURCH.

2. There are two dials on the middle stone of the eastern jamb of the priest's door.

1. The uppermost. This dial is imperfect—the stylehole being wanting. There are four lines only, the noon line is 4in. in length, the mass line (9 a.m.) is marked, and one intermediate line; there is only one line on the east of the noon line, marking the hour for vespers.

2. This is a reduced copy of No. 1. The stylehole is $\frac{1}{2}$ in. diameter, the length of the noon line is 2in.

There are no circles around either of these dials, and they are of a very early type.

There is a hole resembling a stylehole on the same stone to the east of the stylehole of No. 2, with no markings around; it has been suggested that possibly a painted, instead of an incised, dial might have been used but natural holes closely resembling styleholes are often found on the stones used in these buildings.

BOTOLPHS CHURCH.

3. There is a dial on the eastern jamb of the low side window in the south wall of the chancel level with the sill. The stylehole is 5ft. above ground level and $\frac{3}{8}$ ins. in diameter;—the noon line is $2\frac{1}{2}$ ins. long. There is a medial line 5in. in length, and four lines corresponding to those at Coombes; one of these marks the hour for mass, the other for vespers. There are small pits at the end of the radial lines. The stylehole is inclined, sloping south-west, a very rare example, and there is a portion of the style in it which appears to be of latén, an amalgam of zinc and copper much used in the middle ages. There is no circle.

RAPE OF ARUNDEL.

FERRING CHURCH.

4. There is a hole on one of the jambs of the priest's door in the south wall of the chancel, but no lines or circles are now visible; lines might, however, have been so lightly incised as to have been obliterated in the restoration of the church. It is in a likely position for a dial, but only deserves mention.

The centre line of the church is 5° north of true east and west.

RUSTINGTON CHURCH.

5. There is a dial in the east jamb of the priest's door in the south wall of the chancel; the stylehole is 4ft. above the ground level, the noon line is $2\frac{1}{2}$ ins. long.

There is only a small horizontal medial line on the eastern side of the stylehole, which is $\frac{3}{8}$ in. diameter. There are four lines between 6 a.m. and the noon line, one of them being the mass line; there is one full line and a short one between noon and 6 p.m., indicating the hour for vespers. The dial is enclosed in a circle.

The centre line of the church is 5° north of true east and west.

POLING CHURCH.

6. There is a dial on the east jamb of the Early English south door of the nave.

The stylehole is $\frac{1}{4}$ in. diameter, the noon line is 2in. long. There are six radiating rays below the medial line, one being the mass line, another that for vespers; there is no semi-circle.

On the same jamb is a small maltese cross with pits at the ends of the arms.

The centre line of the church is 17° north of true east and west.

SOUTH STOKE CHURCH.

7. There is a dial in the centre of a quoin 15in. square at the south-west corner of the nave. The height of the stylehole is 5ft. above ground level it is $\frac{1}{2}$ in. in diameter, and 1in. deep, a portion of the style being in it. The noon line is 3in. in length. There is a semi-medial line from the stylehole westward, and there are two intermediate lines in the left-hand lower quadrant, one being the mass line. There are two shorter rays in the adjoining quadrant, one indicating the hour for vespers. There are faint traces of an enclosing semi-circle.

There is a hole in a quoin stone at the south-east corner of the nave, but this is probably natural, as the stone of which the church is built pits easily, and such holes are common in it.

The centre line of the church is 4° north of true east and west.

NORTH STOKE CHURCH.

8. There is a dial on the south-east quoin of the south transept of this church. The stylehole is 4ft. 6in. above ground level and $\frac{3}{8}$ in. diameter, the noon line is $4\frac{1}{2}$ in. long.

The dial is a semi-circle, divided by radial lines into 12 hours.

The centre line of the church is 34° north of true east and west.

TORTINGTON CHURCH.

9. There is a very doubtful dial on one of the quoins at the north-west corner of the nave facing north. It is a circle 5in. in diameter 5ft. above ground level, with a small hole in the centre, and an equilateral triangle inscribed within. The markings are very faint, and there is a rain-water pipe across it which prevents a close examination of the stone.

This quoin has been rebuilt.

FORD CHURCH.

10. There are four dial markings at this church.

1. This dial is on a stone at the south-east corner of the nave. The stylehole is 3ft. 6in. above ground level and $\frac{3}{8}$ in. in diameter, the noon line is 3in. in length.

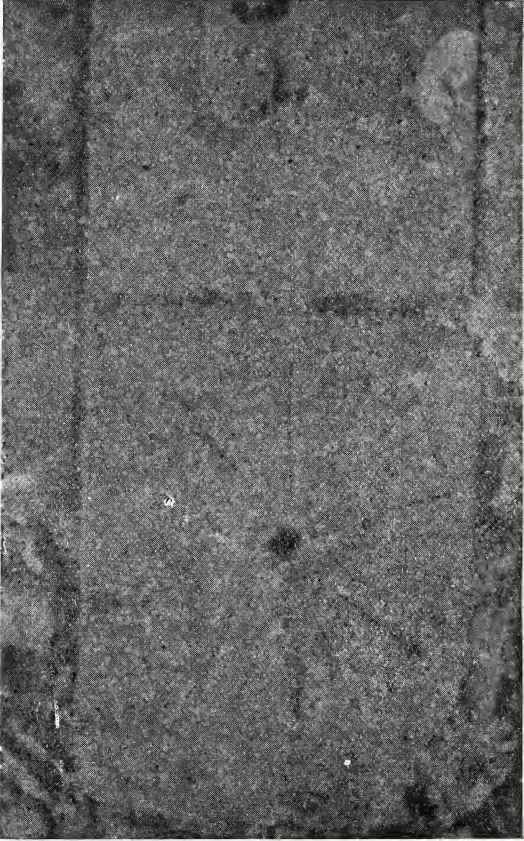
This dial consists of a circle of pits or small holes at the end of radiating lines; there is no circle line connecting them; each of the two lower quadrants having five dots dividing it into six equal spaces, giving the 12 hours, from 6 a.m. to 6 p.m. The upper left-hand quadrant has five divisions irregularly spaced, the right-hand one only one hole; these were, of course, useless for the measurement of time. The stones here bear traces of fire.

2. This dial adjoins No. 1. The height of the stylehole is 3ft. 6in. above ground level; there is no noon or medial line. It is $5\frac{1}{2}$ in. in diameter; there is no circle or radiating lines, the divisions being marked by holes, with the exception of the mass hour, which is shewn by a line also. There are five holes between 6 a.m. and noon, and one between noon and 6 p.m.

3. This dial is on the east face of the quoin stone below No. 2. The stylehole is 2ft. 6in. above ground level; there is no noon line, but a horizontal line through the stylehole. The dial is 4in. diameter, and the divisions are marked by holes. The quadrant, from 6 a.m. to noon, has four divisions, as also that from noon to 6 p.m.

The dial has been continued above the medial line possibly at a later period, the left-hand quadrant being divided into four irregular divisions, and the right-hand into two.

4. This dial is on a quoin stone on the south-east corner of the nave, two stones below dial No. 2.



1. Sundial: Ford Church.

Its centre is 2ft. 6in. above the ground line, the stylehole is $\frac{1}{4}$ in. diameter and very shallow; the holes are also very small and of little depth. The noon line is marked by two pits, as well as the horizontal medial line. There are three radial lines in the lower left-hand quadrant, the centre marking the mass hour, and one in the right-hand quadrant for 3 o'clock. There are no divisions in the quadrants above the medial line.

The markings are very faint, and it is doubtful if this dial was ever in use.

The centre line of the church is 7° north of true east and west.

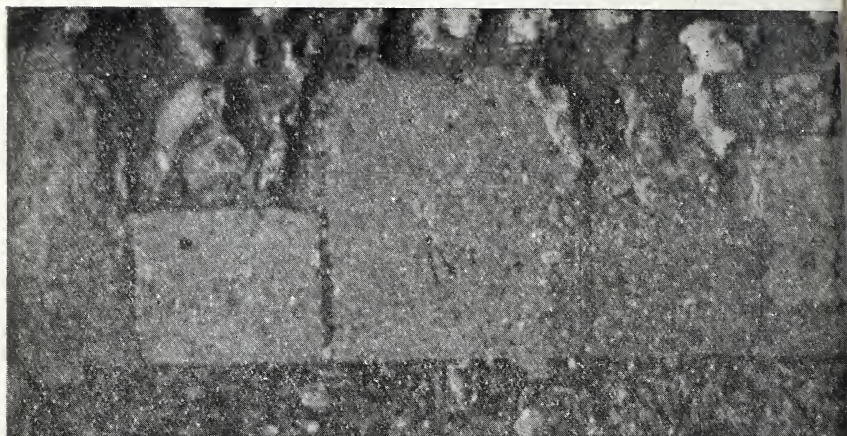
CLIMPING CHURCH.

11. There are three dials on the fine Norman tower of this church.

1. This dial is on the south-west buttress. The stylehole is 3ft. above ground level, $\frac{3}{4}$ in. diameter, and 1in. deep. The noon line is $2\frac{1}{2}$ in. long, the dial being 5in. diameter; there are 13 holes arranged in a circle, with connecting lines to the stylehole, but no incised circle. The lower left-hand quadrant is divided into five spaces, the right-hand one into four, the upper right-hand one into three, and the left to two, both, of course, useless for the measurement of time. There is a small circle around the stylehole.

2. This dial is on a quoin stone above No. 1. The stylehole is 4ft. 3in. above ground level, $\frac{3}{8}$ in. diameter, and 1in. deep. There is no medial line or noon line, but only two pits to mark the mass hour.

3. A rudely scratched dial. The stylehole is $\frac{1}{4}$ in. diameter and very shallow; the dial is 6in. diameter, the mass line only being deeply cut in duplicate lines.



The south-east quoin of the chancel and the west jamb of the priest's door are covered with ivy and could not be examined.

WALBERTON CHURCH.

12. There are two dials on the east jamb of the priest's door in the south wall of the chancel.

1. The stylehole is 4ft. 6in. above ground level, $\frac{1}{4}$ in. diameter and $\frac{1}{2}$ in. deep, the style being broken off in it. The noon line is 3in. long, the circle being 6in. diameter. The rays are five in number in the lower left-hand quadrant, marking the hours from 6 a.m. to noon. In the adjoining quadrant are three rays corresponding to the hours 1, 2 and 4; there is a pit at the end of the noon line and those for 2 and 4 p.m.

This beautiful dial was deliberately mutilated in September, 1917, between the two visits paid to this church, the initials F. E. and R. I. P. being cut upon it. Such vandalism cannot be too severely repudiated.

2. On the third stone below. The stylehole is 2ft. 3in. above ground level and $\frac{1}{4}$ in. diameter. There is a very faint circle 4in. in diameter; the noon line is 2in. in length. There are two rays in the lower western quadrant; there is no mass line; there are pits at the end of each ray.

On the stone above this dial is a hole, but nothing else.

BINSTED CHURCH.

13. There is a very doubtful stylehole on the east jamb of the Early English south door, with a faint line from it in the position of the hour for vespers. This is probably not a dial.

The centre line of the church is true east and west.

FELPHAM CHURCH.

14. There are two dials in this church on the south wall.

1. The stylehole is 4ft. 3in. above ground level, $\frac{1}{2}$ in. diameter and $\frac{1}{2}$ in. deep. The noon line $3\frac{1}{4}$ in. long, the dial being $6\frac{1}{2}$ in. diameter. There is a semi-circle of holes, but no circle line connecting them. There are five radial lines in the lower and four in the right-hand quadrant; there is no circle.

2. This dial is on a diagonal quoin. The stylehole is $\frac{3}{8}$ in. in diameter and 1in. deep; the dial is surrounded by a circle with holes in it. The noon line is $3\frac{1}{4}$ in. long, the circle being $6\frac{1}{2}$ in. in diameter.

The centre line of the church is 4° north of true east and west.

RAPE OF CHICHESTER.

ALDINGBOURNE CHURCH.

15. There are two dials on the west jamb of the Norman south door.

1. This dial consists of a circle with radial lines. The stylehole is 4ft. above ground level and $\frac{3}{8}$ in. in diameter. The noon line is $1\frac{3}{4}$ in. in length, the circle being $3\frac{1}{2}$ in. diameter. The quadrant, from 6 a.m. to noon, is divided into four periods by three lines, the nearest to the noon line being the mass line. The quadrant, from noon to 6 p.m., is similarly divided. The upper quadrants are each marked out into three periods.

2. Below No. 1 on the same jamb. This dial consists of a semi-circle $3\frac{1}{2}$ in. in diameter; the noon line is $1\frac{3}{4}$ in. long, the stylehole is $\frac{3}{8}$ in. diameter. The left-hand quadrant is divided into three spaces of two hours each; the right hand is left blank.

On the nook shaft adjoining are three small crosses with pits at the ends of the arms.

The centre line of the church is 5° south of true east and west.

OVING CHURCH.

16. There are two dials on the priest's door in the south wall of the Early English chancel.

1. A beautiful little dial on the west jamb. The stylehole is 4ft. 3in. above ground level; it is surrounded by a circle of two lines. The noon line is $2\frac{3}{4}$ in. long, the circle, which is double, being $5\frac{1}{2}$ in. in diameter. The quadrant, from 6 a.m. to noon, is divided by lines, with pits at their ends, into five equal spaces. There is one imperfect line only in the corresponding quadrant.

2. In the centre of a stone at the opposite side of the door. This is a much ruder dial. The stylehole is 4ft. 3in. above ground level and $\frac{3}{8}$ in. in diameter; it is very shallow (probably blocked by a portion of the style). The noon line is $2\frac{1}{2}$ in. long, the horizontal line is very faint, the radial lines have a pit at their ends; there is no circle. The quadrant, from 6 a.m. to noon, has the 9 a.m. mass line and one other, and the opposite quadrant is similarly divided.

The centre line of the church is 10° north of true east and west.

BOXGROVE PRIORY.

17. There are two dials on the second buttress of the south aisle from the east end of the church.

1. A plain circle with the mass line only shewn. The stylehole is 5ft. 6in. above ground level, $\frac{1}{4}$ in. diameter and lin. deep; the diameter of the circle is $7\frac{1}{2}$ in.

2. This dial is more elaborate than the other. It is fully divided, enclosed in a double line circle, and a very good specimen of a later date.

The following churches in West Sussex have been examined and no dials found on them :—

Angmering	Hardham
Appledram	Houghton
Arundel	Hunston
Burpham	Littlehampton
Bury	Lymminster
Donnington	North Mundham
Eastergate	Pulborough
Findon	Tangmere
Goring	Westhampnet.

The Author's sincere thanks are due to our member, Mr. C. H. Goodman, who has kindly placed at his disposal the photographs which illustrate this paper; He has visited and photographed, or drawn, several dials which are not described in this paper, not only in West but East Sussex, and it is to be hoped that he will give our Society a paper on them in a future volume of collections.