

SAMUEL TURNER'S VERTICAL DIRECT WEST DIAL ON HIS TOMBSTONE AT MARKET HARBOROUGH

By Allan Mills



Quite close to the railway station in Market Harborough stand the remains of the 12th century church of St. Mary-in-Arden. Once the parish church of Great Bowden, it overlooked a cemetery that contained 1400 graves of generations of local people.



FIG. 1. REMAINS OF THE CHURCH OF ST. MARY-IN-ARDEN, MARKET HARBOROUGH, LEICS.

Many were commemorated by headstones cut from the local Swithland slate¹, which lends itself to fine and durable carving and engraving². In 1901 its chapel-of-ease, St. Dionysius in the town centre, became the parish church of Market Harborough. Consequently St. Mary's fell into disuse, was de-roofed in the 1950s, and the derelict churchyard³ cleared in 1970. Fortunately the finest of the engraved tombstones were retained – albeit by the barbaric method of driving iron spikes through them into wooden supporting rails.

On the north side of the remaining structure is a remarkable memorial to Samuel Turner, 1717 – 1784. Its present appearance is shown in Fig. 2.

It is no longer easy to decipher, but fortunately wax rubbings of this and other headstones were made by Harold Jones², probably in the decade 1970-80 when they were in much better condition. These rubbings are now preserved in the Leicestershire Record Office, and that of Samuel Turner's headstone is shown in Fig.3.



FIG.2. SAMUEL TURNER'S HEADSTONE. SWITHLAND SLATE, 47 INCHES HIGH. PHOTOGRAPHED 19TH FEB. 2009.

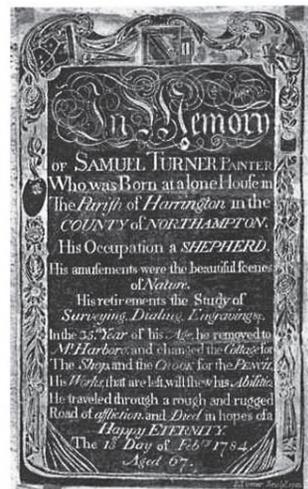


FIG. 3 RUBBING (BLACK WAX) OF TURNER'S HEADSTONE. HAROLD JONES, 1970-80.

The stone was designed and engraved by Turner himself (it is signed 'S.Turner sculpt 1782' at the base) and the epitaph tells the story of a poor boy, born in a humble cottage in rural Northamptonshire, who was highly gifted but condemned by circumstances to initial employment as a shepherd. By his own efforts he taught himself painting, engraving, mathematics and surveying, and at the age of 35 was able to move to the neighbouring small town of Market Harborough. Here he made a living by surveying (in due course beginning the first map of the town) and engraving Swithland slate memorial stones. He was obviously fond of painting and sketching outdoors, but none of these works has survived. A date of death of 1784 was added by another hand, so Turner finished the stone a couple of years previously. The nature of the 'affliction' that is mentioned is not known, but could not have been too threatening as he lived to an age of 67 – considerably above the average for the period.

The decorative border

Within the left hand column of the border is a painter's palette, but the most significant representations are along the top of the stone. (See also Fig.4).



FIG. 4 TOP OF TURNER'S HEADSTONE.

We see a partially unrolled field map of Stoney Farm near Harrington in Northamptonshire, which Samuel knew as a boy. It comprises four fields and a farmhouse, with the river Nene forming one boundary and a road another. This map is followed by the instruments (rule, protractor and dividers) used by surveyors, map-makers and sundial designers. At the centre is the sundial discussed below, flanked on its right by a shepherd's hut beneath a tree and two sheep. An artist – presumably Samuel himself - is shown in the right hand corner, sitting down to paint at an easel. Artists normally stand – could he have been lame?

Vertical east- and west-facing dials

A sundial⁴ constructed on a vertical surface facing west has the form shown in Fig.5.

In order to obey the rule that the style must point to the celestial pole, the gnomon takes the form of a small rectangular plate mounted at right angles to the dial plane along the 6 pm hour line (its shadow is shown on the marked surface). Sunlight falls upon it only after 12 noon, so just the afternoon and evening hours are marked. Their spacing from the 6 pm line obeys the rule:

$$D = H \tan$$

where D = distance
H = height of gnomon
= hour angle

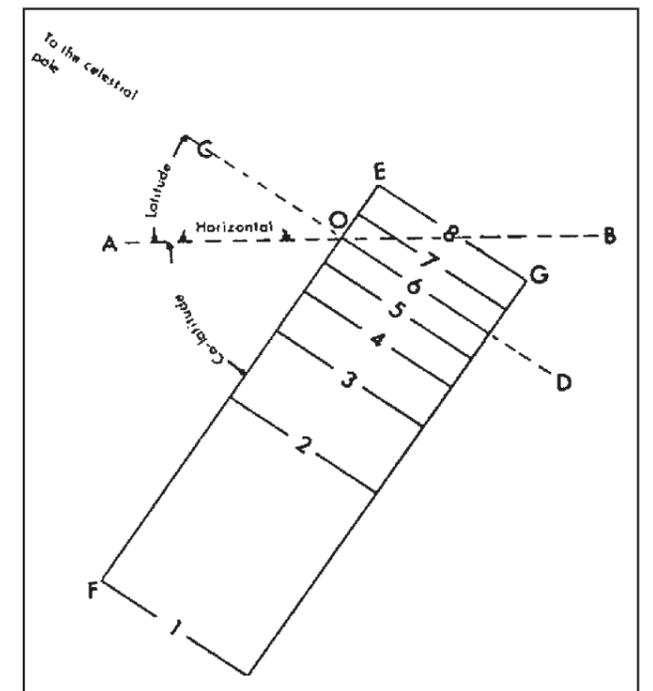


FIG. 5 BASIC CONSTRUCTION OF THE VERTICAL DIRECT WEST SUNDIAL (AFTER WAUGH³).

It will be noted that $\theta = 45^\circ$ for the 3 pm line, so that $\tan \theta = 1$ and $D = H$ at this position. In other words, the distance between the 3 pm and 6 pm hour lines gives the height of the matching gnomon. A direct east vertical dial slopes down from left to right, and can show only the hours before noon. Both east- and west-facing dials are unusual, but Turner's dial appears to be the only known example carved upon a tombstone^{5,6}.

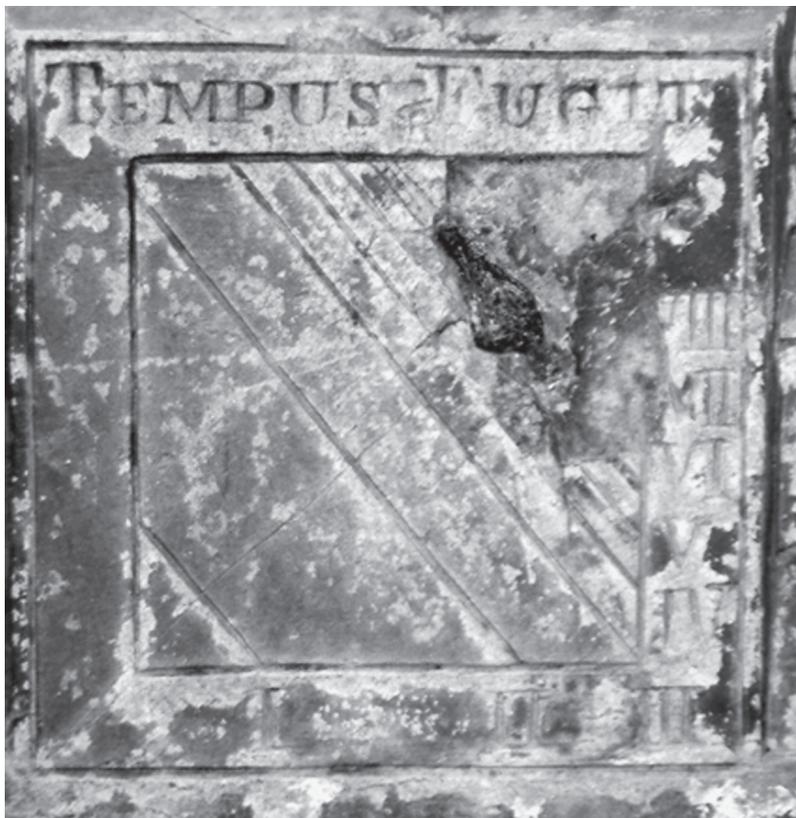


FIG. 6 CLOSE-UP OF DIAL ON SAMUEL TURNER'S HEADSTONE.

Turner's dial

This is shown in close-up in Fig.6, with its motto *Tempus Fugit*.

Actual dimensions, measured across the outer frame of the design, are three and five-eighths inches square. The hour lines slope at 52° , although the modern value for the latitude of Harborough is 52.5° N. These lines are graduated around the edge from I to VIII, with the remains of an iron gnomon cemented into the VI line, probably with a quicklime/linseed oil mastic. Their spacing fits well enough with 52° , so Turner taught himself dialling to good effect – although probably using an alternative geometric method to that shown above for laying-out the dial. Several books existed to help^{7,8}, but whether he could obtain access to one is another matter! The distance between the 3 pm and 6 pm lines indicates that the style of the iron gnomon would have been positioned $5/8$ inch above the plane of the dial.

All this calculation and careful engraving does assume, of course, that after

Samuel Turner's demise some reliable person would have been available to set up the tombstone vertically and facing due west!

Notes and references

1. Swithland 'slate' is actually the metamorphic product of a deposit of very fine volcanic ash. In this it differs from, for example, Welsh slate, which is derived from clay.
2. J.C.Davies: 'Harborough Slate Engravers', *Trans. Leicestershire Archaeological & Historical Society* 61 (4) 24-33 (1987). Available at HYPERLINK "<http://www.le.ac.uk/lahs/daviesvolume LXI-4 sm.pdf>" www.le.ac.uk/lahs/daviesvolume LXI-4 sm.pdf.
3. Photographs are reproduced in J.C.Davies, *Bowden to Harborough* Published by the author, 1964, and S.Mastoris, *Around Market Harborough in Old Photographs* Sutton, 1989.
4. A.E.Waugh: *Sundials: Their Theory and Construction*, Dover New York (1973).
5. Roger Bowling: 'The gravestone of a sundial maker' *British Sundial Society Bulletin* 21 (ii) p.46 (June 2009).
6. Colin Davis: 'A question answered' *British Sundial Society Bulletin* 21 (iv) p.13 (Dec. 2009).
7. William Leybourn: *Dialling*, London, 1682.
8. Charles Leadbetter: *Mechanick Dialling*, London, 1773.