The Qumran Temple Scroll (11Q19) plans a new temple and its courts which the authors believed should be built in Jerusalem. It follows the concept of Ezekiel 40–43, written with a similar intention. Where Ezekiel’s plan itself reflected Babylonian science, expressing perfection through symmetrical squares, the Temple Scroll added the sophistication that had been developed over subsequent centuries. Further study of time, a central concern at Qumran, had enhanced the concept of its equivalence with space. The square courts, larger than those of Ezekiel, were to be punctuated in the walls by gates that may be shown to be placed according to an exact science of time derived from the positions of the sun.

The gates leading to the middle and outer courts are named for the tribes of Israel, in the same relative positions in both sets of walls. The sizes of the gates and the spaces between them are set out in the text in numbers of cubits. On the eastern wall in both courts, the first gate, on the north-east, is for Simeon, the central one for Levi, and the south-eastern one for Judah. On the south wall, Joseph (Ephraim-Manasseh) in the centre is flanked by Reuben and Benjamin. On the west wall, Zebulun lies in the centre, with Gad on the north-west and Issachar on the south-west. On the north wall, Naphtali in the centre is flanked by Asher and Dan (39:11–16; 41:1–11) (Diagram A).

In each of the four quarters of the complex of courts, a triangle is formed by two straight sides around a right-angle at the centre of the walls (Diagram A). The size of the other two angles of the triangle is determined by the length of the two straight sides, the perpendicular and the base. Of these, angle $\theta$ lies at the centre of the whole complex, facing the north-south perpendicular opposite. Given information on the length of the perpendicular and base, the size of this angle can be calculated by trigonometry.
In an important earlier article Margaret Barker has shown that the gate of Simeon in the north-eastern section of both sets of walls is so placed that the rising sun at the summer solstice would shine on this...