St Machar's Cathedral – 1859 re-enactment of Foucault's pendulum

Foucault’s pendulum was the sensational public science demonstration of the 1850s. It showed in a closed room that the Earth was rotating. It settled beyond any doubt that the reason the stars, Sun and Moon go round in the sky is not because they are spinning round the Earth but because the Earth is rotating in space. If Copernicus or Galileo had only known, at least two centuries of anguish would have been saved. They had neither the physics nor the mathematics to make the deductions from such a pendulum, even if they had inadvertently observed the result.

Foucault hung his pendulum in the dome of the Panthéon in Paris. The venue is impressive - a building intended as a cathedral but finished just as the French revolution decided that churches along with the monarchy were a Bad Thing. The Panthéon is now a permanent memorial to French national heroes. It was also a near perfect place for Foucault, since his pendulum needs to be able to swing for several hours without coming to a halt. That means a long wire support and a very heavy bob. [Nowadays, shorter pendula are hung with a fancy contraption for maintaining the swing without influencing the movement]. I believe Foucault’s original pendulum is the lead-filled brass bob swinging in the converted chapel that is part of the Conservatoire National des Arts et Métiers. A replica occupies centre stage in the Panthéon as shown in the two pictures on the right. The first shows the monumental scale of the interior, the second the high dome from the centre of which the pendulum was hung.

Natural Philosophy students of King’s College were taken by Professor Thomson in 1859 to see a re-enactment of Foucault’s experiment from the not so high ceiling of St. Machar’s Cathedral, shown in the final picture. There
is no dome and no hope of replicating the 67 m long Panthéon pendulum but the experiment was described in the reminiscences of that class as the most memorable of the year. The illustration at the top of this article shows the heavy, lead pendulum bob, weighing 22 kilos, in the Natural Philosophy Historical Scientific Instrument Collection. It is very likely to be the bob that Thomson used in his St. Machar’s Cathedral demonstration.

The small projection at the side of the bob is to attach a piece of string to hold the pendulum steady before it is released. The string is burned by match or candle so the pendulum is started with absolutely no sideways movement imparted by hand. The spike below is to show clearly the track of the pendulum. In Foucault’s original, the spike left marks in dry sand on the floor.

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