

## Note on Restoration of the Sundial at Nunraw

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The ancient stone sundial at Nunraw belongs to the great era of building sundials in Scotland during the 17<sup>th</sup> and 18<sup>th</sup> centuries. It consists of three multi-facet stones with a total of 34 separate dials. When the sundial was found in the garden it was in poor condition. It has now been restored and this short note describes it.

The dial on top and the large dial below at the front read the time at Nunraw. The other dials tell the time at places and cities round the world. The place names relate to ancient civilisations from biblical times and to contemporary destinations for merchant trading in the 1700s. Halifax in Nova Scotia was founded in 1749, the latest of all the names, so the sundial must date from after then.

The geometry of the large polyhedron stone is complex. This in turn requires complex mathematics to design an accurate miniature sundial for each of the faces. These all had to be analysed. To restore the dials to working order, 34 new gnomons needed to be designed, manufactured, patinated, and fitted to the stone. The completed sundial was installed in accurate alignment with the sun on its new paved platform.

The sundial tells the time when the sun shines. The gnomons cast their shadows onto the stone along lines marked with the hours. The two dials for Nunraw show local time there. All the facet dials with other names show local times elsewhere. Sundial time is local solar time, which is unfamiliar nowadays, but it can be adjusted to Greenwich Mean Time. This needs one shift for longitude and a second shift for the equation of time.

A sundial from 18<sup>th</sup> century Scotland showing the time at different places round the world, made in the style of the one at Nunraw, is very uncommon. There are examples from the period showing times at many places, but normally on a single dial not a complex polyhedron, and made in brass or bronze not carved in stone. The stone sundial at Nunraw, which has such a complex shape and separate dials for so many different places, is exceptional and appears to be unique.



*Stone sundial after restoration*



*Original condition of sundial in the garden*