

# PAINTING WITH LIGHT: A Sculptor's Take On Sundialling

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This is the story of how, as a sculptor, I was drawn into the world of Sundials, not by an interest in the technicalities of dialling but by their aesthetics and poetry, and how, over the past few years I have adapted my working methods and materials to the challenges of sundialling.

Sitting on a garden bench I am watching one of my sculptures gradually transform as the afternoon sun moves into the evening. Sharp crisp forms are softening and being thrown into deep shadowed relief; what seemed like smooth unblemished surfaces at midday are gradually becoming pitted with dents and dips previously unseen.

It sounds like the most obvious effect in the world, but to a sculptor, used to making solid tangible objects, the first time I registered this process fully when applied to sculpture it came as something of a revelation. I realised that, unlike sculpture viewed in the fixed, controlled light of an interior, outdoor sculpture has no fixed form; it is a con-

stantly changing thing totally dependant on the shifting light of the sun. Many years before becoming seriously involved with sundialling and recognising the significance of this process, I received a commission to make a declining vertical sundial using calculations supplied by the commissioning architect. For this, as if anticipating these thoughts and observations, I chose to use the traditional sundial inscription 'Moved by the Light' (Fig. 1). As you will see I went on to be just that!

Early pioneers of photography described their new process as "painting with light". It struck me that this is actually a very good description of what sculpture is all about. My perception of it shifted from the fixed, heavy and monumental towards something more temporary and fleeting; a slave to Time and Place, part of something much bigger than itself. A sense of place is created by a mixture of a location's physical features and all sorts of associations and significances accumulated over time, and as an artist specialising in making site specific artworks these twin themes of Time and Place are central to my approach. They also lie at the heart of, and are essential ingredients in, the creation of any sundial whether it is made for sculptural, decorative or practical purposes.

Lured into the world of sundialling for all these aesthetic and poetic reasons, but with little grasp of the technicalities of dialling – indeed positively daunted by them – my first experiment in the field neatly sidestepped the need for any detailed sundialling calculations. A commission for a sculpture depicting the legend of Daedalus and Icarus (Fig. 2) seemed an obvious opportunity to enrol the Sun as an active player in the work. Daedalus, the practical grounded craftsman, sits on a stone making a wing, in contrast to his impulsive son Icarus, the dreamer. Emphasising the wing's fragility, a bird flies down to pluck a feather from it. Frozen in time, the bird serves as a gnomon as its shadow falls sequentially across four relief panels (Fig. 3) depicting the essential elements of the legend; the construction of the wings (Earth), the fateful flight (Air), the catastrophic encounter with the Sun (Fire) and finally the plunge into the sea (Water).

This commission awakened my interest in sundials and my sense of their sculptural possibilities. After a few false starts a little investigation showed that it was fairly easy to get on top of the basics of dialling, and



Fig. 1. Declining vertical sundial. Keim mineral paints and gold leaf on GRC panel. Painted for a purpose-built niche in newly built sheltered housing; Alloa, Clackmannanshire, 1989.



*Fig. 2. Daedalus the wing-maker; Sun sculpture. Cold cure cast bronze. Private commission, Wiltshire. 2002.*

*Fig. 3 (below). Daedalus the wingmaker; the four narrative images highlighted in sequence by the passing shadow of the bird.*



once these were grasped this opened up an enormous range and variety of forms which I explored and experimented with, shamelessly exploiting and combining them for purely sculptural reasons.

A series of experiments followed (Fig. 4), some to commission, some for their own sake, some more accurate than others, one resulting in the accidental discovery (I haven't come across another dial maker using quite this form) of a design with real practical advantages in northern latitudes. This was a combination of a horizontal and equatorial dial with a glass centre to the equatorial disc to allow the winter hours on the horizontal dial (GMT) to be viewed through the disc. With the steeply tilted gnomon of an equatorial sundial in northern latitudes, this avoids the need to bend double to read the shadow on the underside of the disc while comfortably accommodating the marking out of BST on the top surface of the equatorial disc (Fig. 5), easily read in the summertime. I went on to use a variation of this elegant solution on another sundial, commissioned to commemorate a 50<sup>th</sup> birthday (Fig. 6).

*Fig. 4. A table top equatorial sundial with adjustable latitude setting. The passage of time is symbolised by the tree rings sand-blasted into the glass equatorial disc. Cast Jesmonite AC730 with glass and wood. Personal project 2008.*



Fig. 5. Combined equatorial and horizontal dial. Cast Jesmonite AC730, bronze and glass. Commissioned by the Museum of the University of St Andrews, 2008.



Fig. 6. Combined equatorial and horizontal dial. Cast Jesmonite AC730, bronze and glass on a carved oak pedestal. Private commission 2009.

At this point, I was realising that as well as relating closely to the significance of the Sundial at a conceptual level, I was finding that my favoured sculptural forms and materials were particularly suited to the making of sundials. As far as my choice of materials goes I'm a bit of a Jack of all trades: I work in a wide range of materials and happily mix and adapt them to suit the project in hand. But most of my work is rooted in modelling and carving, using clay, plaster, and sometimes wood. Moulding and casting are central to my work to achieve my final results and a material that I frequently cast into is a concrete-based casting medium with a stone powder aggregate called Jesmonite AC730, which I will refer to simply as 'Jesmonite' throughout this article. I work extensively in bas relief and I have had a longstanding interest in cut lettering and the inclusion of text in sculpture, all of which fit in well with sundials.

I was already no stranger to care and attention, as the craft of casting and mould-making is one that calls on a fair amount of both, but making sundials set a whole new stand-

ard in the degree of precision required. The first time I was commissioned to produce a sundial requiring a fair degree of accuracy, for the St Andrews University Museum, I turned to familiar methods and materials, sculpting in plaster and using wax to model the text, bas relief detail and dial markings, and casting the whole piece into Jesmonite; but I also needed to develop and adapt my casting techniques to meet the challenges of sundialling, for example working out a method for the accurate setting of the gnomon (Fig. 7).

As a designer of sculpture I have been used to the freedom to create forms restricted only by broad considerations such as materials, scale, and subject matter. It was a new experience to have to tailor my design decisions to the technical constrictions of sundialling. As is so often the case with boundaries, however, these limitations actually focussed my thinking and provided interesting starting points which resulted in designs that I might never have come up with otherwise. For example, in response to a commission to create a sundial to sit on a tree stump in Royal Circus Garden, Edinburgh, I chose to take the Scottish Enlightenment as my theme. This seemed particularly appropriate in the context of an Edinburgh New Town garden. For this I revisited and adapted the traditional lectern dial, a form in fairly common use in Scotland at the turn of the 18<sup>th</sup> and 19<sup>th</sup> cen-



Fig. 7. Setting the gnomon for the St Andrews University Museum Sundial: first, the bronze rod was set in the wax original to form the gnomon and then, after incorporating the gnomon in the mould, preserving its position exactly, the cast was made round the gnomon, replicating its position in the final result.



*Fig. 8. A Sundial for the Scottish Enlightenment. Cast Jesmonite AC730, with cor-ten steel on a tree stump. Commissioned by the Royal Circus Garden Committee, 2010.*

turies (Fig. 8). The dial carries the inscription “We find no vestige of a beginning; no prospect of an end”. With these words in Edinburgh in 1788 James Hutton announced the arrival of Deep Time. His geological discoveries overturned Bishop Ussher’s biblical chronology in which the Earth had been created in 4004 BC, revealing a timeframe too huge for the human mind to grasp. What better subject for a sundial?

Hutton’s place at the heart of the Scottish Enlightenment gives his words a special resonance on a sundial sited in Royal Circus, a perfect example of the architecture which expresses the intellectual climate of the time so well. The sundial is positioned at the centre point of the circle which forms the Circus. Royal Circus was designed by one of the leading Scottish architects of his time, William Playfair, whose uncle, the mathematician John Playfair, was a close friend and disciple of James Hutton.

A sundial necessarily reveals the underlying order and geometry of the universe, making it an apt expression of Enlightenment thinking. This sundial takes the form of a rough organic rock sliced open to expose a dark polished surface bearing the inscribed text and sundial markings. Thus a rational and structured explanation of the natural world is revealed at the heart of the apparent disorder of nature in the raw.

The top of the tree stump forming the plinth is capped with a profiled sheet of cor-ten steel, a steel that forms a surface rust without continuing to degrade. The face of the dial is cleft by a wedge of the same material, forming the gnomon. As well as having an intrinsic aesthetic appeal, I felt that rusted steel carried an echo of the intense industrial innova-



*Fig. 9. Sphere Sundial. Cast Jesmonite AC730 on carved oak plinth with mild steel bracket. Private commission*

tion that coincided with this high point in Scottish intellectual life.

Using a similar combination of materials for a sundial made in response to a commission to mark the retirement of a Cambridge anthropologist, I once again let my design be led by the style of dial I’d chosen to make (Fig. 9). A Jesmonite sphere cast from an original modelled in wax sits on top of a carved oak plinth with a bracket made from mild steel rotating round a central post angled to match the latitude. This bracket is then adjusted to minimise the shadow it casts and a reading can then be taken from the calibrations around the ‘equator’.

I was drawn to the spherical form for two reasons. This sundial was to form a pausing point on a meditative walk around the garden and I was reminded of Thomas Jefferson’s sphere sundial in his garden at Monticello, Virginia, where such an inventive and perceptive mind must have likewise indulged in so much creative thought. Also, the sphere form was perfect to express the symbolism underlying this dial. The form and imagery are an attempt to encapsulate the nature of the anthropologist’s intellectual life and his relationship to the world as a whole. From a sundialing point of view, the sphere represents in micro form the planet Earth, so it seemed natural to continue this analogy into the content of the imagery. The sculpted surface of the sphere represents the physical world (fish, plants, rivers), while by peeling away the top layer a new layer is revealed representing the world of ideas. This is shown by the use of



Fig. 10. “Katie Wearie’s Hours”; sculptural sundial and bench. Bronze and cast concrete. The West Port, Linlithgow. Commissioned by the Provost of Linlithgow 2010.

text, exposing the quotation attributed to Einstein; “Make things as simple as possible – but not simpler”.

By this time I was eager for a chance to incorporate a sundial into a large scale public work; after all, the Sundial can be seen as the ultimate site-specific artwork, with its configuration and positioning being so precisely determined by its location. In 2010 I got the chance to do this in a commission for the West Lothian town of Linlithgow. This sundial celebrates an apocryphal local character, a 19<sup>th</sup>-century cattle drover called Katie Wearie, shown resting in



Fig. 11. “Frae Furrow tae Firmament in Four Lowps; The Fourth Lowp”. A sculptural sundial forming the fourth in a series of linked sculptures sited throughout the Robert Burns Birthplace Museum, Alloway. Bronze figures cast from clay originals on cast Jesmonite plinths. Commissioned by the National Trust for Scotland, 2010.

her favourite place beneath a tree at the West Port, the site of the sculpture, while a bird sings in the branches above her head (Fig. 10). Returning to an old motif, I once again used the bird to serve as a gnomon, but this time, more confident of my dialling capabilities than when I made my Daedalus piece, I marked out the hours on the ground using granite setts. Sitting on the bench, the passer-by is invited to join Katie Wearie in watching the world pass by while the shadow of the bird moves gradually across the dial.

I was struck by how popular the sundialling element of the work was with the general public and what a valuable introduction it provided to the content of the sculpture and its reflection on the passage of time. There were of course familiar issues to be addressed; explanations of GMT versus BST, the equation of time, adjustment for Longitude, tolerance of a less than totally even ground surface; but I realised that the design of a sundial plays a huge part in people’s expectations of accuracy. If the overall impression of the work is one of extreme precision then that is what is expected of it; however, if the work is clearly primarily sculptural and the markings broad enough, people readily accept the symbolic nature of the timekeeping. I am certainly not saying that I am happy with inaccuracy, but sometimes what I would rather describe as ‘imprecision’ is what is appropriate.

Alongside this fairly straightforward sculptural sundial I was also making a sculpture for the new Robert Burns Birthplace Museum in Alloway, Ayrshire. I was interested to see how the sundialling element of this sculpture could be developed away from the simple telling of the hours towards something more narrative without losing the magic of a predictable time-linked result. Here I went back to the idea initiated in my Daedalus piece of using the sun’s cycle to add poetry and poignancy to the story telling content of the sculpture. By now my sundialling abilities had developed to enable me to produce a more calculated and resonant result.

The discovery that Burns had received tuition in gnomonics as a young man justified the idea of making a group of sculptural elements linked by the underlying principals of a sundial (Fig. 11). At the centre of the group, a figure of Burns, leaning at an angle of 55.4°, forms the gnomon, casting his shadow across three features each linked to a different poem (Fig. 12). The poem referred to on the corn sheaf with two bronze mice forming the 9am mark is, of course, “To a Mouse”, while the wistful girl with the rose on the 1pm mark alludes to “My Love is like a Red Red Rose”. Lines from each poem appear on the central plinth, accompanied by a spyhole which is aligned to view details on the markers which fill in the missing words from the lines (Fig. 13).

Finally, at 4pm Burns’ shadow moves round to meet the figure of a girl sitting on a plinth, passing across the words “The Lea Rig”, fulfilling the wish expressed in the final verse of the poem of the same name:



Fig. 12. Detail of Fig. 11; The Burns Sundial gnomon.



Fig. 13. Details of Fig. 11; The 9am, 1pm and 4pm hour marks and the spy holes on the main plinth with views through them.

Gie me the hour o' gloamin' grey,  
It maks my heart sae cheerie-o  
to meet thee on the Lea Rig  
My ain kind dearie'o

While hopefully working at a purely decorative level, this work is dense with content and requires a fair amount of unravelling. I felt this element of puzzle and enigma was appropriate to the situation and subject matter, and the sundialling aspect of the work fitted into this well. It highlighted for me just how much people love the abstract qualities of sundialling, and how ready they are to accept what could almost be described as a conceptual dimension to sculpture where they might well be put off by this in

another situation. When confronted with the arrival of a new sculptural installation the response often seems to run a bit like this; "So what's all this then? ....Oh it's a Sundial!". Suddenly the sculpture has justified its presence!

I would like to finish this tour of sculptural sundials sitting in the full afternoon sun on the side of Ben Lawers in the heart of the Scottish Highlands, beside a group of sculptures incorporating a sundial, commissioned by the National Trust for Scotland (Fig. 14). Here the sundial is used as an interpretive device to convey information about the natural environment. An angled slab behind the vertical dial is marked with the months of the year, and the natural events associated with each one. A circle of light travelling through the face of the dial at noon serves as a solar calendar.

The presence of a sundial in this unexpected situation proves that the sun does sometimes penetrate the clouds even here, justifying the optimism that has led to so many and varied sundials in Scotland. I hope my contributions will find a place in this rich tradition and help to keep it alive in defiance of our climate.

**Tim Chalk** is an Edinburgh-based sculptor specialising in public artwork. His work can be seen in many public places, museums and collections throughout Britain. He has worked collaboratively with architects, designers, museum curators and other professionals to produce a wide range of site specific artworks. For the last few years he has had a special interest in sundials and has incorporated this into his wider sculptural practice. For a full picture see [www.chalkworks.com](http://www.chalkworks.com)



Fig. 14. Interpretive Sculptures in a "Ghost Sheiling" enclosure; incorporating a vertical sundial and solar calendar as part of the overall scheme. Cast concrete, stone and cor-ten steel. Commissioned by the National Trust for Scotland, 2012.