# SUBLIME SYMMETRY

*The Mathematics behind De Morgan's Ceramic Designs*

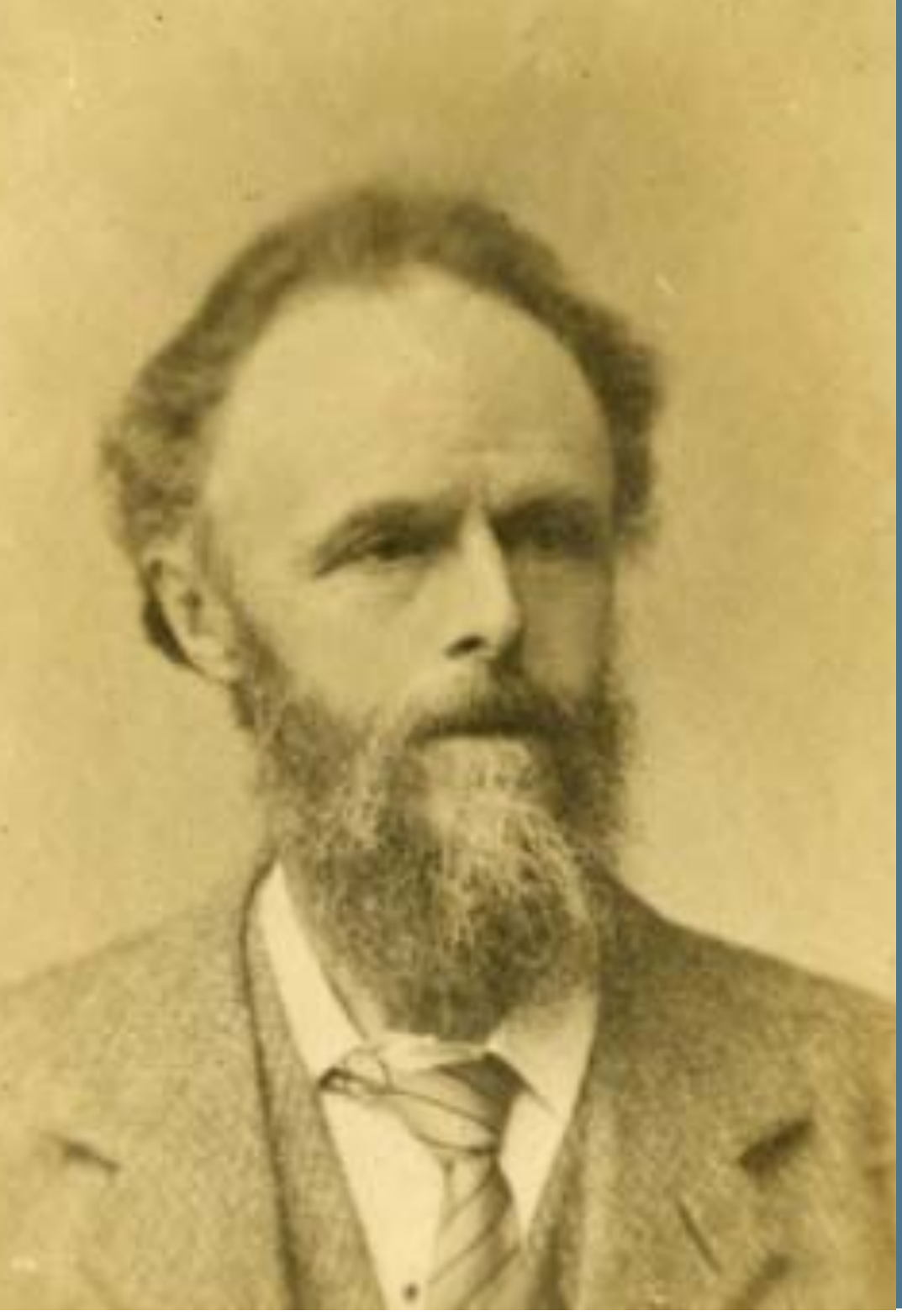
# Sublime Symmetry Exhibition

Curated by Sarah Hardy, this exhibition investigates the notable Victorian ceramicist William De Morgan's, use of mathematical principles in his beautiful ceramic designs. In its first year, it attracted over 52,000 visitors and 2,000 school pupils.

Through a rigorous examination of the mathematical devices used in De Morgan's designs and original research, *Sublime Symmetry* presents William De Morgan as a natural mathematician and talented draughtsman, which has drawn interest from mathematicians and art historians alike.

It is a temporary exhibition specifically designed to teach KS2 mathematics through ceramic design. The exhibition is organised thematically, around key principles of geometry taught at KS2 and is a huge draw to family and school visitors.

The education pack can be viewed here: http://www.demorgan.org.uk/sites/default/files/ education_pack_guildhall.pdf



# William De Morgan (1839 – 1917)

William De Morgan (1839 - 1917) was undoubtedly the most intriguing and inventive ceramic designer of the late Victorian period. His conjuring of fantastical beasts to wrap themselves around the contours of ceramic hollowware and his manipulation of fanciful flora and fauna to meander across tile panels fascinated his contemporaries and still captivates today. Over his career William De Morgan revolutionised the field of ceramic design with his reinvention of lusterware, dedication to studying and perfecting Middle Eastern designs, invention and use of his own kilns and his wonderful patterns.

De Morgan was born destined for a lustrous career. His father was Augustus De Morgan, the first professor of mathematics at University College London and first president of the London Mathematical Society. His mother, Sophia Frend, was a social reform campaigner and the daughter of  William Frend, another notable mathematician.

William began drawing from an early age and remained interested throughout his studies at University College Schools. He trained at Cary's drawing school before embarking on a formal artistic training at the Royal Academy, where he saw his worlds of maths and art collide in the classical ratios, linear perspectives, and scales he was taught there.

In 1863, he met William Morris and abandoned his ambition to be an artist, instead embarking on a career as a designer. He worked on stained glass for ten years before making the tiles, plates, vases, and pots which he is best remembered for.

# Pattern

Pattern making requires a rigorous working knowledge of geometry in order to visualise how a single tile's design might repeat to cover a whole wall. The true splendour of De Morgan's tiles can be fully appreciated when the full pattern is displayed.

De Morgan would use the scaling up method to draw his large tile design schemes on paper and then apply them to the physical tile surface, confident that they would be aesthetically pleasing when realised as a scheme. He would work with ratios and complex measurements to ensure their success.

Owing to his skill as a draftsman and his innate mathematical comprehension, De Morgan was able to draw an entire pattern around a central line that would have perfect mirror symmetry when completed.

Vases and pots which De Morgan decorated with patterns would be painted by him directly onto the ceramic surface. Using his vision and spatial awareness, he could manipulate his two-dimensional drawings to perfectly adapt them to fit every curve of the three-dimensional object.

# Symmetry

In art, symmetry is synonymous with beauty. This mathematical tool requires a design to be transformed by reflecting, rotating or scaling it, but without changing any of its other properties.

A central line of symmetry around which a pattern is constructed, gives form and order to the most elaborate of designs.

Many of De Morgan's patterns and designs are organised symmetrically. The eye is drawn into the central line or point which gives clarity to the ornamentation. De Morgan's floral motifs and undulating curls of foliage appear structured due to their symmetrical ordering.

Symmetry can also add interest and dynamism to flat surface designs. Motifs which have been rotated around the edges of De Morgan's plates force the eye around the design, giving a wonderful circular movement and making his fantastical plants and animals seem alive.

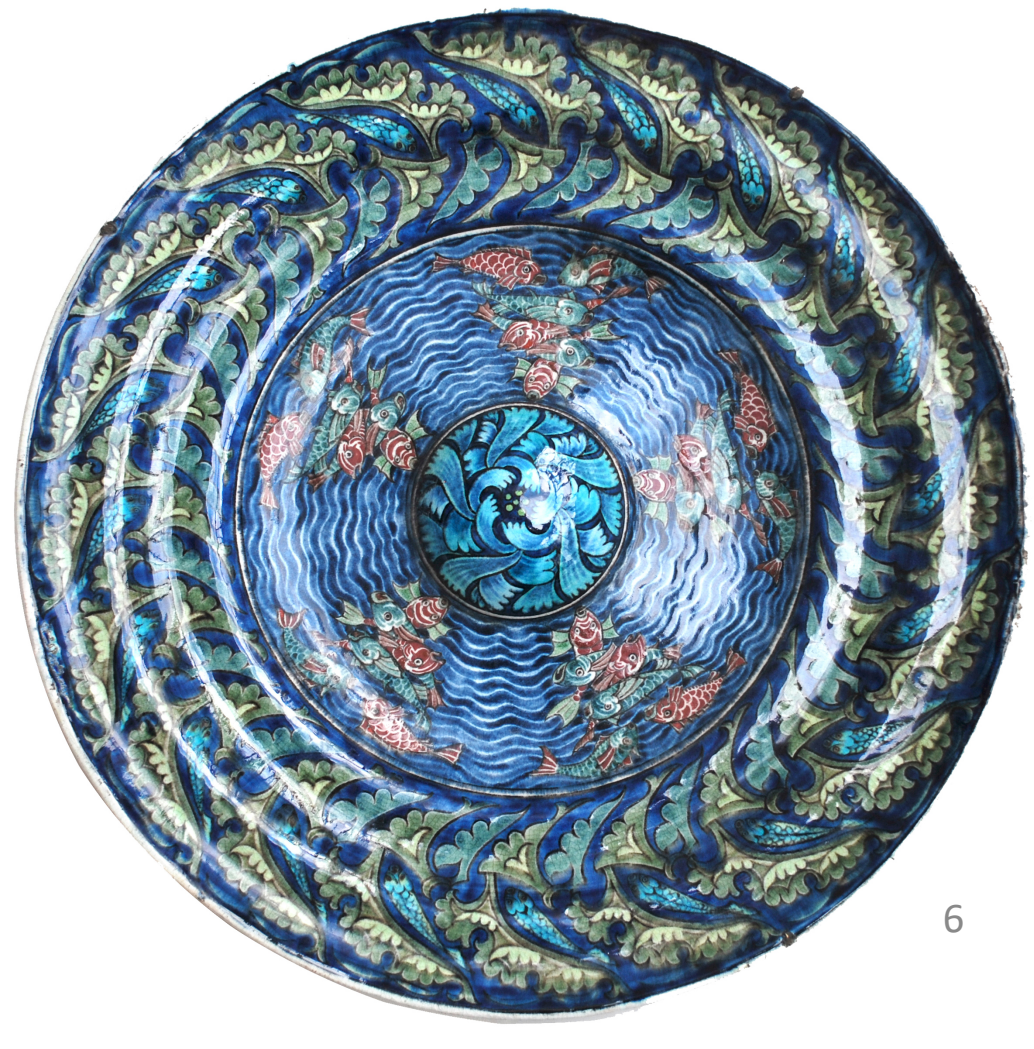
# Shape

De Morgan once said that Euclid's *Book I*, an ancient Greek text exploring linear geometry, was one of the most fascinating works of literature. This shows his interest in the properties and construction of shapes.

From his square tiles to his round plates and bowls, De Morgan had to consider shape in all of his flat surface designs. Each tile design is mathematically considered so that when the tiles are installed on interior walls the various elements of the design match up and create a beautiful and well-structured pattern.

Continuous circle patterns can be seen on the borders and rims of De Morgan's elaborately decorated dishes and plates. He has borrowed this decoration from Islamic design, where such circular patterns represent the infinite nature of Allah, as they can be endlessly traced with no beginning and no end. De Morgan manipulated the properties of such circles to ensure his border designs are in proportion.

De Morgan's innate gift for using mathematics in his designs is evident in his vases and pots. The two-dimensional designs for the surface of these complex shapes have been imagined and executed in three dimensions onto the ceramic form by De Morgan, so that he could create beautiful designs which complement the vase or plate which they decorate.



# The Exhibition

Sublime Symmetry is is a touring exhibition, available for hire by reputable museums and art galleries, for four to six months. It requires approx. 9m³ display case space over 13m shelf space and 28m wall space.

The exhibition loan fee is £10,000 and includes:

- The loan of 76 ceramic objects
- Hard copies of the exhibition catalogue, highly acclaimed in a review written featured in the Pre-Raphaelite Society Journal
- Digital education pack which introduces the mathematical devices in De Morgan's work to KS2 school children
- Hard copies of the family 'trumps' card game
- Children's sliding tile puzzle
- A press release and selection of images cleared for marketing and publicity use
- Digital text panel and object label text
- Curation, condition reports and condition reporting, couriering and project management by the De Morgan Foundation
- Shop stock on an exclusive sale or return basis
- Curator talk for the events programme

Contact Sarah Hardy, Curator and Manager of the De Morgan Foundation
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# DE MORGAN

COLLECTION

Founded by William De Morgan's sister-in-law, Wilhelmina Stirling, the De Morgan Collection is the largest and most comprehensive collection of De Morgan artwork in the world. It comprises some 70 oil paintings, 600 drawings and 800 ceramics.

The Collection is run and cared for by the independent charity, the De Morgan Foundation (charity number 310004). It is displayed in long-term loan exhibitions at three partner sites, Cannon Hall in Barnsley, Watts Gallery in Surrey, and Wightwick Manor in Wolverhampton.

www.demorgan.org.uk