Circling the Square
& my Mathematical Magic progressions

MathsJam National Gathering, Stone 01/12/19

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1986 – Remembering School Maths in the late 70’s (SMP?)

I was asked to make a quilt for an exhibition called Mathematical Magic.

Eventually I remembered how I learnt my time tables by shading certain types of numbers in one colour each time.

**Number Patterns-Odds/Evens/0’s and 1-3’s on 10x table**
1986 - 0-99, 1-100 or 10x table grids?

Left – So I drew up the 3 basic grids for each type, and another with the prime factors

Right – Number Patterns 4-9 on 10x table filled in with black felt pen

Lateral thinking – What happens if I use a different colour for each digit (0-9)?
1986 – The Final Designs
1986 - Decimal Rainbows

Left – 0-99 basic grid finished quilt
Right – Poster for the exhibition

Made for the ‘Mathematical Magic’ exhibition at Greens Mill, Sneinton, Nottingham
1986 - Prime Factors

• Dividing numbers into their factors

• Subdividing the squares into up to 6 sections

• Though I made two mistakes!

• Do you know where they are?

• There are 29 different colours when there should only be 27!
1990 - Developing the Mathematical Magic colouring sequence grids

Left top half – Yellow on number 5, 6, 7: Then on 8, 9, 0 on basic triangular division grids

Left bottom half – Yellow on 1, 2, 3: Then an alternative 3 colour order & 2 on rectangular division grids (C & D)

Right top half – Grid E, F, H: Then E inverse, G, I (E = X & rest V shaped grids)

Right bottom half - Grid J (reflected triangles) Grid B with 10’s preference: Then J alternative & Grid B with units preferences

The 0-99 grid where 4 is the 5th square along becomes my preferred layout – because it creates a balanced but asymmetrical design with a central cross which becomes more relevant in my later pieces.....
1994 - Hands that Flung Stars Into Space

- This uses my Mathematical Magic colouring sequence in the bottom heavy triangles
- I interwove a split rainbow into the design on the top heavy triangles
- Words - a line from Graham Kendrick’s ‘The Servant King’
- My first commission in Manchester - for the first Chaplain of our theology college (Northern)
1995 – The Light Shines In The Darkness

The Mathematical Magic sequence occurs in the bottom heavy triangles.

The sun, rainbow, sky, old church and city skyline feature in the top heavy triangles.

Triptych - made in 3 pieces so it could be hung in different locations if required.

Commissioned by an anonymous donor for the new St Brides, Old Trafford, church building.

Black on the back for Good Friday.
1997 - Taking a new perspective

- Commissioned by the new, chaplain at Northern College

- She asked me to combine the Mathematical Magic designs with another commission which used a false perspective

- The fixed points at top & bottom, with lines ruled between, distorts the image

- An effect I appreciate, so I wonder about using a circular grid

- Designs – coloured crayon
The solid fabric gives the straight edges a more pronounced curved effect

What if I use a circular grid next time?

Year of Haley’s Comet (but I’d just mis-cut the corner)
1997 - Discovering Polar Grids

- By chance I found some polar grids in an engineering book in my teaching course college library

- I wondered how my MM series would work on a circular grid

- I don’t see a need for this design yet but it makes me think about circular designs

- I later discover it’s what I need for my 3D pieces

Top – Do I Cope or Not? - design for 2 quarters of a polar grid

Bottom – Come and See - redrafted curves - the false perspective on the previous piece
1997 - Moving into circles and spirals

• Moved to London

• Asked to make a 24” square piece for the Quilter’s Guild 90’s Collection – showcasing contemporary quiltmakers

• Circles fit best onto squares – so it’s an obvious choice

• Trying different layouts for In The Beginning, God, I realise the central cross has created a series of spirals
1997 - In The Beginning, God

- 5th piece in my Mathematical Magic series
- Note the 4 crosses spiralling out
- The ragged centre is chaos becoming form in Creation with a hidden golden lurex core
- Commission for the Quilter’s Guild 90’s collection by the London region
- Resides in York now
Changing the scale and number of spirals

The number of rays creates a very different effect -

1997 - In The Beginning, God
   – 4 spirals - like a windmill/pinwheel (2 ft)

1997 - Blesséd Trinity
   – 3 spirals like a triskele (4 ft)
Changing the number of circles

1999 – Blesséd Trinity
Originally loaned to Clapham URC, London to cover diamond shaped wall panels

2000 – Infinity
The colours on the inside and outside of the LH rings swap over on the RH side

Also for Clapham URC but it went on an exhibition tour & the church then closed
2004 - Introducing Fibonacci To The Spirals

2004 - Fibonacci Rings
• 34 rays – it’s the nearest Fibonacci number to the earlier 36 rays I used
• Changing width rings - in Fibonacci proportions 1, 1, 2, 3, 5, 8”

2004 - Fibonacci Rays
• 3 ray sequence repeats – in 1, 1, 2, 3, 5, 8 proportions
• Regular width rings – 11 rows
Going 3D – remember this grid?

1997 - Do I Cope or Not?
- Designed but never made up
- Essentially it makes a cone – which is what I needed for Toblercone Rings

Left – 2004 - Toblercone Rings - 34 rays - a Fibonacci number, & same width rings

Right – 2004 - Toblercone Rays - 34 x regular 3D rays (68 strips) & regular width rings
2014 - Circular grids – more layouts

Mini bonded blocks based on 2004 Fibonacci Rings for Festival Of Quilts

Left – first stage - whole segments to understand the technique and learning how to place the colours so the design rotates

Centre – second stage - the spirals go anti clockwise, but the bottom heavy & top heavy triangle spirals are fairly close to each other

Right – second stage – the top heavy triangles rotate clockwise, bottom heavy triangles radiate from the centre in straight rays

There are 100’s of permutations
2003 - Question - What if I use 3 circles?

Left - Answer – I end up with two clockwise and one anticlockwise spirals (or vice versa).


Right - So to get a balanced symmetrical design I had to create a wave design with the colours instead (my husband suggested using cosines) so it’s a bit like the Isle of Mann logo – a triskelion
I’d made the red spiral panel in 2003 and pinned the layers together, but I was unhappy with the colours in the triangular area in the centre between the circle.

The logical Mathematical Magic progression meant there was too much orange at the centre, and, the red background was a bit meagre (I’d run out of the fabric).

So I put it aside to do other work, until a last minute decision to enter it in a competition at the Festival Of Quilts in 2019, when I added on the dramatic border.
2006 & 2019 - Trinity Three

- My quilt on display in The Festival of Quilts’ Art Quilt competition category

- The solution to the centre triangle – reintroduce some red backing fabric to pull the orange and other colours together
What next? Quads?

• What if I use four spirals?
• What possibilities will that provide?
• How many ways can I link the circular grids to one another?

Left top – Trinity Four – 3 spirals on 4 rings
Left bottom – Quad Four v 1 – 4 spirals - 2 each anti/clockwise circles
Right top – Quad 4 Four v 2 – 4 clockwise
Right bottom – Quad Four v 3 – 4 anti clockwise circles
Even more spirals- where can it go?

- In the future – what about five circles?

- Or six, or seven........

- How many spirals – the rays within the circle?

- Other colourways – or a more monotone approach?

- Other 3D shapes – **Infinity** as a 3D mobius piece?

- I want to re-explore my colouring system, do a book, have an exhibition on it ........ so much to discover!
Thank you for coming

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