Mathematics and God: beauty, effectiveness, truth, and $\sqrt{666}$

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The disturbing case of Mark McCartney and the 'Satanic code' (circa 1984)

A=6,
B=12,
C=18,…
Z=156

M+A+R+K+M+C+C+A+R+T+N+E+Y=870

G+E+R+R+Y+A+D+A+M+S=666

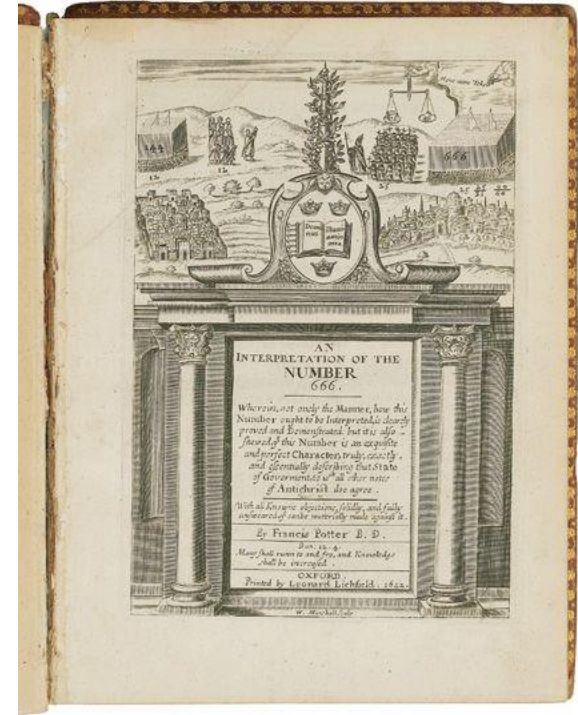I+A+N+P+A+I+S+L+E+Y=666

B+A+R+R+Y+F+O+R+D+E=672

Francis Potter (1594–1678) and $\sqrt{666}$

'He has told me that he oftentimes dreamt that he was in Rome, and being in fright that he be seized on and brought before the pope, did wake with the fear.'

John Aubrey's *Brief Lives*.

Francis Potter and $\sqrt{666}$

- 144 cubits is the thickness of the walls in the New Jerusalem (Rev. 21v17)

- $\sqrt{144} = 12$

- 12 disciples, 12 tribes of Israel (a number associated with the *true* church)

- $\sqrt{666} \approx 25\frac{25}{31}$

- Thus 25 was a number of the *false* church
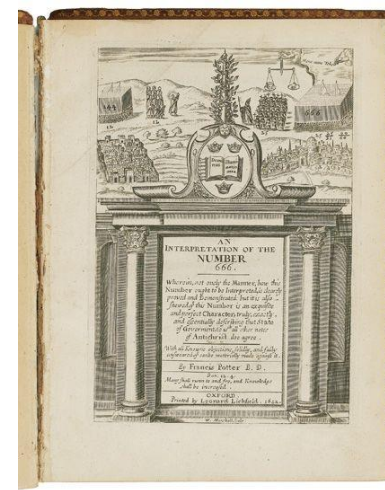
The wicked and naughty ways of 25

- 25 cardinals in the original College
- 25 articles in the Catholic creed
- 25 prelates at the 25 sessions of the Council of Trent
- The Holy Door of St Peter's was opened every 25 years, and there were 25 altars nearby.
- These altars had the 5 wounds of Christ engraved on them 5 times.
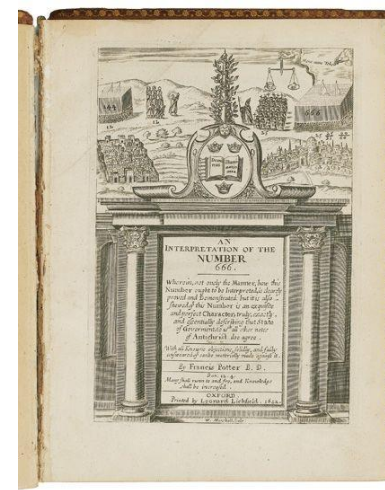
A slide which isn't strictly necessary: Textual resonators vs numerology

- 12 disciples and 12 tribes of Israel
- 40 days in the desert and 40 years in the wilderness
- 15=3x5 – a Trinitarian sanctification of the 5 senses
- 12=3x4 disciples took the Trinitarian gospel to the 4 corners of the world
- 153 fish in a catch (John 21v11)

Beauty, truth, and the Basel Problem

Jacob Bernoulli (1654-1705)

$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + ... = \, ?$$

'If anyone finds and communicates to us that which has thus far eludes our efforts, great will be our gratitude.'

Jacob Bernoulli (1689)

Leonhard Euler (1707-1783)

$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + ... \ = \frac{\pi^2}{6}$$

And for an encore…

$$\frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \frac{1}{4^4} \ldots\ldots = \frac{\pi^4}{90}$$

$$\frac{1}{1^6} + \frac{1}{2^6} + \frac{1}{3^6} + \frac{1}{4^6} + \ldots. = \frac{\pi^6}{945}$$

$$\frac{1}{1^{26}} + \frac{1}{2^{26}} + \frac{1}{3^{26}} + \frac{1}{4^{26}} + \ldots = \frac{76977927 \times 2^{24} \pi^{26}}{1 \times 2 \times 3 \times \ldots \times 26 \times 27}$$

Beauty, truth and Platonism

Euler's result is considered by mathematicians to have three virtues, it is *unexpected,* it is *beautiful,* and it is *true.*

But did Euler *discover* this result, or did he simply *show that it follows* from certain basic rules about numbers?

Mathematical Platonism states that mathematical truths exist independently of the universe and we discover them.

G. H. Hardy (1877-1947)

' I will state my own position dogmatically in order to avoid minor misapprehensions. I believe that mathematical reality lies outside us, that our function is to discover or observe it, and that the theorems which we prove and which we describe grandiloquently as our "creations", are simply our notes of our observations.'

A Mathematician's Apology, 1940.

Roger Penrose (1931-)

'I have made no secret of the fact that my sympathies lie strongly with the Platonic view that mathematical truth is absolute, external and eternal, and not based on man-made criteria; and that mathematical objects have a timeless existence of their own, not dependent on human society nor on particular physical objects.'

The Emperor's New Mind, 1989.

Alvin Plantinga (1932-)

Most people who have thought about [mathematical Platonism] think it incredible that these abstract objects should just exist, just be there, whether or not they are thought of by anyone, more broadly, whether or not they are the object of any kind of mental or intellectual activity…It is therefore extremely tempting to think of abstract objects as ontologically dependent upon mental or intellectual activity in such a way that either they are just thoughts, or…couldn't exist if not thought of…On the other hand, if abstract objects were divine thoughts there would be no problem here. So perhaps the most natural way to think of abstract objects, including numbers, is as divine thoughts.'

Theology and Science, 2011.

The unreasonably effectiveness of mathematics in the natural sciences

Eugene Wigner (1902-1995).

'The mathematical formulation of the physicist's often crude experience leads in an uncanny number of cases to an amazingly accurate description of a large class of phenomena. This shows that the mathematical language has more to commend it than being the only language we can speak; it shows that it is, in a very real sense, the correct language.'

Eugene Wigner, 1960.
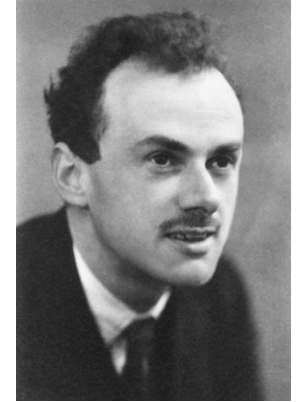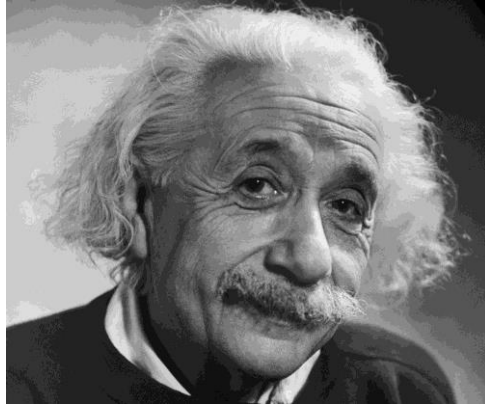
The effectiveness of mathematics is 'a wonderful gift which we neither understand nor deserve'.

Eugene Wigner, 1960

'How can it be that mathematics, being after all a product of human thought which is independent of experience, is so admirably appropriate to the objects of reality?'

Albert Einstein, 1921

'[the] remarkable fact that, apparently, matter completely and fully abides by the formalism of mathematics.'

David Hilbert, 1919

'Physical laws should have mathematical beauty.'

Paul Dirac, 1957

Why is mathematics so effective?

- Mathematics is the means to describe patterns – so it is no surprise that a pattern filled universe is described mathematically.

  John Barrow (1952-), Cambridge

- The universe *is* mathematics.

  Max Tegmark (1967-), MIT

- God created a law based universe, and part of the 'three Rs' of what it means to be made in the image of God is to be endowed with the capability to understand those laws.

Physical laws *do* have mathematical beauty

$$\nabla \cdot \underline{E} = \frac{\rho}{\varepsilon_o}$$

$$\nabla \cdot \underline{B} = 0$$

$$\nabla \times \underline{E} = -\frac{\partial \underline{B}}{\partial t}$$

$$\nabla \times \underline{B} = \mu_o \underline{J} + \mu_o \varepsilon_o \frac{\partial \underline{E}}{\partial t}$$
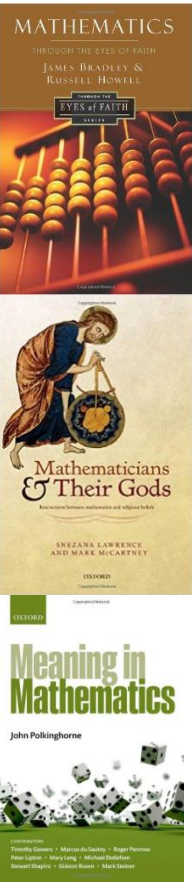
Beauty, effectiveness, truth?

The heavens declare the glory of God; the skies proclaim the work of his hands. Day after day they pour forth speech; night after night they display knowledge.

Psalm 19 v 1

Further Reading

- J Bradley & R Howell, Mathematics through the eyes of faith (HarperOne, 2011).

- S Lawrence & M McCartney (eds.), Mathematicians and their gods (OUP,2015).

- J Polkinghorne (ed.), Meaning in mathematics (OUP, 2011).