



## THE MATHEMATICIAN'S NIGHTMARE

### *The Vision of Professor Squarepunt*

#### Prefatory Explanation

My lamented friend Professor Squarepunt, the eminent mathematician, was during his lifetime a friend and admirer of Sir Arthur Eddington. But there was one point in Sir Arthur's theories which always bewildered Professor Squarepunt, and that was the mystical, cosmic powers which Sir Arthur ascribed to the number 137. Had the properties which this number was supposed to possess been merely arithmetical no difficulty would have arisen. But it was above all in physics that 137 showed its prowess, which was not unlike that attributed to the number 666. It is evident that conversations with Sir Arthur influenced Professor Squarepunt's nightmare.

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The mathematician, worn out by a long day's study of the theories of Pythagoras, at last fell asleep in his chair, where a strange drama visited his sleeping thoughts. The numbers, in this drama,

were not the bloodless categories that he had previously supposed them. They were living breathing beings endowed with all the passions which he was accustomed to find in his fellow mathematicians. In his dream he stood at the centre of endless concentric circles. The first circle contained the numbers from 1 to 10; the second, those from 11 to 100; the third, those from 101 to 1000; and so on, illimitably, over the infinite surface of a boundless plain. The odd numbers were male; the evens, female. Beside him in the centre stood Pi, the Master of Ceremonies. Pi's face was masked, and it was understood that none could behold it and live. But piercing eyes looked out from the mask, inexorable, cold and enigmatic. Each number had its name clearly marked upon its uniform. Different kinds of numbers had different uniforms and different shapes: the squares were tiles, the cubes were dice, round numbers were balls, prime numbers were indivisible cylinders, perfect numbers had crowns. In addition to variations of shape, numbers also had variations of colour. The first seven concentric rings had the seven colours of the rainbow, except that 10, 100, 1000, and so on, were white, while 13 and 666 were black. When a number belonged to two of these categories—for example if, like 1000, it was both round and a cube—it wore the more honourable uniform, and the more honourable was that of which there were fewer among the first million numbers.

The numbers danced round Professor Squarepant and Pi in a vast and intricate ballet. The squares, the cubes, the primes, the pyramidal numbers, the perfect numbers and the round numbers wove interweaving chains in an endless and bewildering dance, and as they danced they sang an ode to their own greatness:

We are the finite numbers.  
We are the stuff of the world.  
Whatever confusion cumbers  
The earth is by us unfurled.  
We revere our master Pythagoras  
And deeply despise every hag or ass.  
Not Endor's witch nor Balaam's mount  
We recognize as wisdom's fount.

But round and round in endless ballet  
 We move like comets seen by Halley.  
 And honoured by the immortal Plato  
 We think no later mortal great-o.  
 We follow the laws  
 Without a pause,  
 For we are the finite numbers.

At a sign from Pi the ballet ceased, and the numbers one by one were introduced to Professor Squarepunt. Each number made a little speech explaining its peculiar merits. /

1: I am the parent of all, the father of infinite progeny. None would exist but for me.

2: Don't be so stuck-up. You know it takes two to make more.

3: I am the number of Triumvirs, of the Wise Men of the East, of the stars in Orion's Belt, of the Fates and of the Graces.

4: But for me nothing would be four-square. There would be no honesty in the world. I am the guardian of the Moral Law.

5: I am the number of fingers on a hand. I make pentagons and pentagrams. And but for me dodecahedra could not exist; and, as everyone knows, the universe is a dodecahedron. So, but for me, there could be no universe.

6: I am the Perfect Number. I know that I have upstart rivals: 28 and 496 have sometimes pretended to be my equals. But they come too far down the scale of precedence to count against me.

7: I am the Sacred Number: the number of days of the week, the number of the Pleiades, the number of the seven-branched candlesticks, the number of the churches of Asia, and the number of the planets—for I do not recognize that blasphemer Galileo.

8: I am the first of the cubes—except for poor old One, who by this time is rather past his work.

9: I am the number of the Muses. All the charms and elegancies of life depend upon me.

10: It's all very well for you wretched units to boast, but I am the godfather of all the infinite hosts behind me. Every single one owes his name to me. And but for me they would be a mere mob and not an ordered hierarchy.

At this point the mathematician got bored and turned to Pi, saying:

“Don't you think the rest of the introductions could be taken for granted?” At this there was a general outcry:

11 shrieked, “But I was the number of the Apostles after the defection of Judas.”

12 exclaimed, “I was the godfather of the numbers in the days of the Babylonians—and a much better godfather I was than that wretched 10, who owes his position to a biological accident and not to arithmetical excellence.”

13 growled, “I am the master of ill-luck. If you are rude to me, you shall suffer.”

There was such a din that the mathematician covered his ears with his hands and turned an imploring gaze upon Pi. Pi waved his conductor's baton and proclaimed in a voice of thunder: “Silence! Or you shall all become incommensurable.” All turned pale and submitted.

Throughout the ballet the Professor had noticed one number among the primes, 137, which seemed unruly and unwilling to accept its place in the series. It tried repeatedly to get ahead of 1 and 2 and 3, and showed a subversiveness which threatened to destroy the pattern of the ballet. What astonished Professor Squarepint even more than this disorderly conduct was a shadowy spectre of an Arthurian Knight which kept whispering in the ear of 137: “Go it! Go it! Get to the top!” Although the shadowy character of the spectre made recognition difficult, the Professor at last recognized the dim form of his friend, Sir Arthur. This gave him a sympathy with 137 in spite of the hostility of Pi, who kept trying to suppress the unruly prime.

At length 137 exclaimed: “There's a damned sight too much bureaucracy here! What I want is liberty for the individual.” Pi's mask frowned. But the Professor interceded, saying, “Do not be too hard on him. Have you not observed that he's governed by a Familiar. I knew this Familiar in life, and from my knowledge I can vouch that it is he who inspires the anti-governmental sentiments of 137. For my part, I should like to hear what 137 has to say.”

Somewhat reluctantly, Pi consented. Professor Squarepunt said: "Tell me, 137, what is the basis of your revolt? Is it a protest against inequality that inspires you? Is it merely that your ego has been inflated by Sir Arthur's praise? Or is it, as I half suspect, a deep ideological rejection of the metaphysic that your colleagues have imbibed from Plato? You need not fear to tell me the truth. I will make your peace with Pi, about whom I know at least as much as he does himself."

At this, 137 burst into excited speech: "You are right! It is their metaphysic that I cannot bear. They still pretend that they are eternal, though long ago their conduct showed that they think no such thing. We all found Plato's heaven dull and decided that it would be more fun to govern the sensible world. Since we descended from the Empyrean we have had emotions not unlike yours: each Odd loves its attendant Even; and the Evens feel kindly towards the Odds, in spite of finding them very odd. Our empire now is of this world, and when the world goes pop, we shall go pop too."

Professor Squarepunt found himself in agreement with 137. But all the others, including Pi, considered him a blasphemer, and turned upon both him and the Professor. The infinite host, extending in all directions farther than the eye could reach, hurled themselves upon the poor Professor in an angry buzz. For a moment he was terrified. Then he pulled himself together and, suddenly recollecting his waking wisdom, he called out in stentorian tones: "Avaunt! You are only Symbolic Conveniences!"

With a banshee wail, the whole vast array dissolved in mist. And, as he woke, the Professor heard himself saying, "So much for Plato!"