

How a Mathematician Turned an Obscure Number Into a Scary Story



Math can even baffle demons. (Photo: [alessio/CC BY 2.0](#))

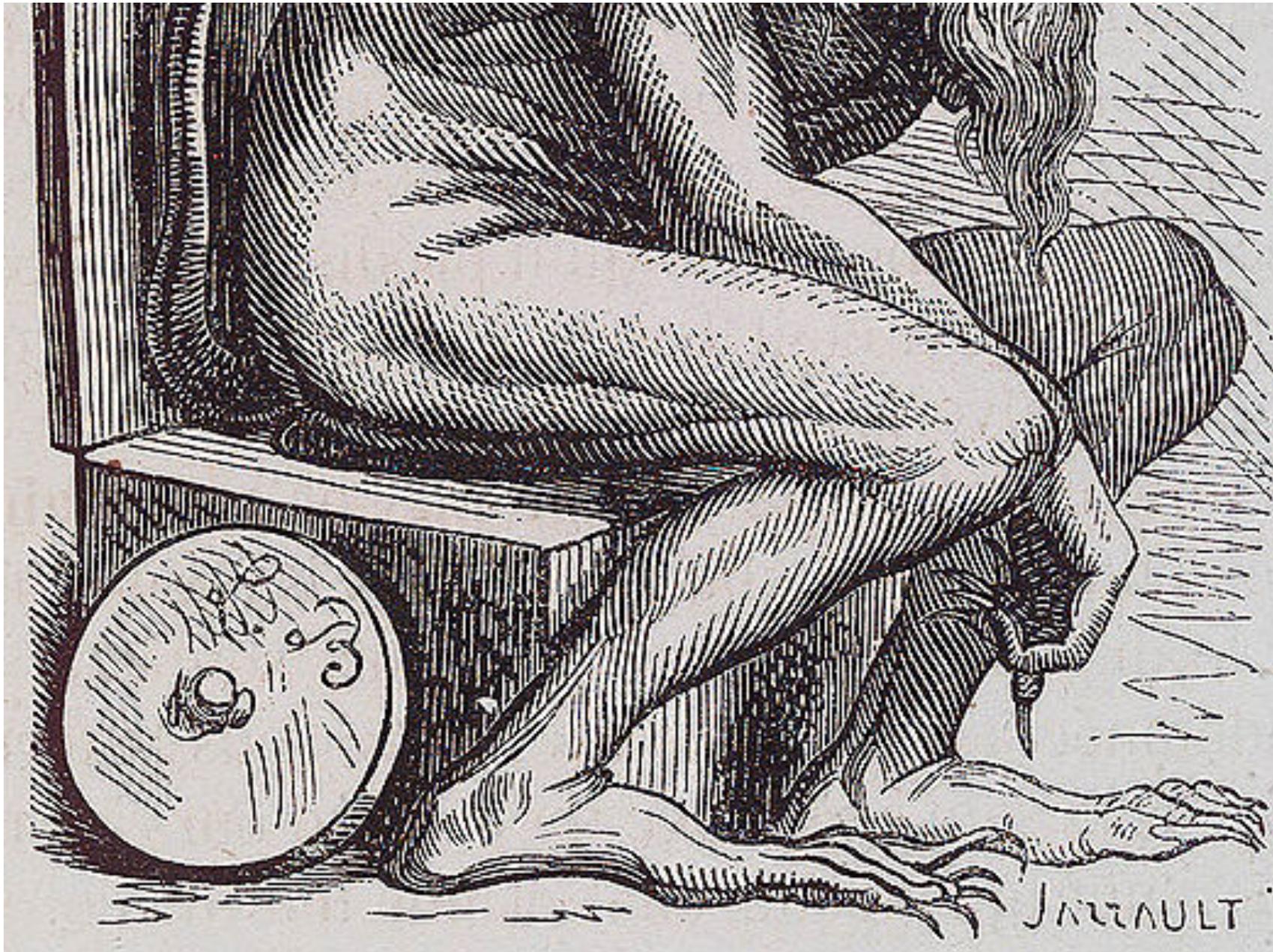
For the most part, numbers are simply cold indicators, unable of expressing menace or guile, but then there's Belphegor's Prime, a supposedly sinister numeric palindrome that has a NUMBER of odd qualities. Or at least that's what one mathematic trickster would have you believe.

The number known as [Belphegor's Prime](#) is exactly, 1,000,000,000,000,066,600,000,000,000,001. For those without the fortitude to stare directly at the infernal number, that's a one, followed by 13 zeroes, followed by the traditional Number of the Beast, 666, followed by yet another 13 zeroes, and a trailing one.

The first thing to know about Belphegor's Prime is that it is a literal prime number, which if remember from math class means that it is divisible only by itself, and one. Being a prime number is not exactly a claim to fame in and of itself, but given the ridiculous enormity of Belphegor's Prime, its primality is not immediately evident, but can be proven using a primality algorithm (like [here!](#)). In addition, it turns out that it is also part of a calculable system of prime numbers.

According to author, mathematician, and "father" of Belphegor's Prime, [Cliff Pickover](#), the infernal number was actually first discovered by prime number hunter Harvey Dubner, who determined that it was part of a sequence. The set of primes could be reached by altering the number of zeroes on either side of the 666 to appropriate amounts. This is to say that the number 16,661, with no zeroes at all, is also a prime number. Then the next time a similar palindromic number becomes prime is when you have 13 zeros (Belphegor's Prime!), then again when you have 42 zeros, etc. "Harvey Dubner determined that the first 7 numbers of this type have subscripts 0, 13, 42, 506, 608, 2472, and 2623," says Pickover.





Belphegor as depicted in the *Dictionnaire Infernal*. (Photo: [J.A.S. Collin de Plancy/Public Domain](#))

While natural prime numbers are as rare as any number (which is to say that they are not rare at all, considering that

theoretically, an infinite amount of numbers exists), Belphegor's Prime also stands out for its poetic symmetry. Another way to express the infernal number is $10(13)6660(13)1$, which truncates the 13 zeroes into modifiers in the parentheses, thus joining the Number of the Beast in the center of the string, with a pair of traditionally bad luck numbers on either side. Furthermore, the number contains a total of 31 digits, which, [as some have pointed out](#), is simply a backwards 13! Circles within circles.

But even with these notable elements, and the abstract connotation to Western concepts of "evil" numbers, the number known as Belphegor's Prime is simply just another number. It wasn't until Pickover got his hands on it that it became the cursed number it is today.

Pickover seems modest about creating the concept of Belphegor's Prime, but it was his ability to give the large number character that is the reason it is known today. "I am not actually the 'creator' of the number, in the sense that people have known about beastly palindromic primes before I gave a name to a very eye-catching number with 13 zeros, to help focus broad attention on it," says Pickover. He has authored dozens of books on subjects ranging from mathematics and death to puzzles and medicine. His stated goal is "to expose a broad audience to the wonders of science and math," and he does so using playful, but complex concepts like "vampire numbers" and "magic hypercubes." Belphegor's Prime is just another of his attempts to tease out the strange wonders of math.



Belphagor has something to show you... (Photo: [Michael Pacher/Public Domain](#))

Pickover named the number after Belphegor, one of the seven princes of Hell, who is known primarily for tempting mortals with the gift of discovery and invention. Why Pickover chose Belphegor exactly is unclear. On [Pickover's own site](#), he warns people not to stare at the number too long, and to look away and take a deep breath, after a few seconds. He also links the number to a symbol from the mysterious [Voynich Manuscript](#), a work that may itself be some sort of massive troll.

Belphegor's Prime is said to be represented in the manuscript by a glyph that resembles an inverted pi symbol. How diabolical.

Ultimately, Belphegor's Prime is a sort of mathematical creepypasta. While it's based on an actual number that holds a number of interesting properties, even Pickover himself urges it not to be taken too seriously. "I wouldn't focus on too much of the fun details on my web page, because there's some humor there, as I use my playful imagination," says Pickover.

Like all good creepypasta, Belphegor's Prime has gained a slow popularity outside of its original site. It has been referenced in [a BBC article by popular science author Simon Singh](#), and it can be found in the [Online Encyclopedia of Integer Sequences](#).

Even though there is no truly demonic power held by Belphegor's Prime, it sure makes numbers fun. And if you still find it scary, as [one Reddit user points out](#), you can take solace in the fact that 1000000000000007770000000000001, is also a prime number, so it looks like Heaven's in the math game too.