They say the pen is mightier than the sword, and authorities have often greed. From outlawed religious tracts and revolutionary manifestos to ensured and burned books, we know the potential power of words to overturn the social order. But as strange as it may seem, some numbers have also been considered dangerous enough to ban. Our distant ancestors long ousted objects using simple tally marks. But as they developed agriculture Nd began living together in larger groups, this was no longer enough. As umbers grew more complex, people began not just using them, but honking about what they are and how they work. And by 600 B.C.E. in ancient Greece, the study of numbers was well-developed. The mathematician Pythagoras and his school of followers found numerical patterns in shapes, music, and the stars. For them, mathematics held the deepest secrets of the universe. But one Pythagorean named Hippias's is covered something disturbing. Some quantities, like the diagonal of a quare with sides of length one couldn't be expressed by any combination f hole numbers or fractions, no matter how small. These numbers, which we all irrational numbers, were perceived as a threat to the Pythagorean's option of a perfect universe. They imagined a reality that could be described with rational, numerical patterns. Historians write that Hippias's was wild for publicizing his findings, while legends claim he was drowned as punishment from the gods. While irrational numbers upset philosophers, later mathematical inventions would draw attention from political and religious authorities, as well. In the Middle Ages, while Europe was still sing Roman numerals, other cultures had developed positional systems that included a symbol for zero. When Arab travellers brought this system o the bustling maritime cities of Italy, its advantages for merchants and ankers was clear. But the authorities were more wary. Hindu-Arabic numerals were considered easier to forge or alter, especially since they were less familiar to customers than to merchants. And the concept of zero penned the door to negative numbers and the recording of debt at a time when moneylending was regarded with suspicion. In the 13th century, Lorene banned the use of Hindu-Arabic numerals for record keeping. And Hough they soon proved too useful to ignore, controversies over zero and negative numbers continued for a long time. Negative numbers were dismissed as absurd well into the 19th century. And prominent mathematicians, like Gerolamo Cardanol, avoided using zero, even though it would have made it much easier to find solutions to cubic and the quartic equations. Even today it's illegal to use some numbers for different reasons. Some are banned because of what they represent. For example, governments have prohibited the display of numbers that have symbolic earning, such as the date of a revolution or connections to

oppositional political figures or parties. Other numbers are potentially illegal because of the information they carry. Just about any information, whether text, image, video, or executable programs can be translated into a string of numbers. But this means that protected information, whether copyrights, proprietary arterials, or state secrets can also be represented as numbers, so possessing r publishing these numbers may be treated as a criminal offense. This idea adhered attention in 2001 when code that could be used to decrypt DVDs was widely shared and distributed in the form of a large prime number. The idea of illegal numbers may sound absurd, but like words, written numbers are a way of expressing concepts and information. And in a world here calculations and algorithms shape more and more of our lives, the mathematician's pencil grows stronger by the day.
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