# PAPÔS

The best kept secrets of the Greeks were not the powerful maritime weapons devised by Archimedes, nor the mystical properties possessed by "golden" proportions, but the unnerving imperfections underlying both. These crude blotches of apparent nonsense were ignored by most mathematicians, but the more the field progressed, the more ill-tempered enigmas crept in.

For instance, a square was considered a perfect geometric object—all sides of equal length, four right angles uniting them harmoniously. But drawing a diagonal line between one corner and the opposite corner gave rise to trouble, for the ratio of that diagonal to the length of the side did not result in an even fraction, but a maddening spate of endless decimals.

So fretful was this observation to Pythagoras that he and his brotherhood chose to keep it from sight, militantly denying its existence to all outsiders. To speak of it at all was heresy. But irrational numbers were sprouting up with increasing frequency and it was becoming difficult to uphold the doctrine of numerical purity. When the unfortunate Hippasus of Metapontum threatened to reveal the secrets of π and the other irrationals, the Pythagoreans had the feisty geometer thrown from the deck of a ship.

Or so legend has it. Whatever the fate of Hippasus, rumors of his supposed demise made their way across the Grecian isles.

When they migrated toward Papôs, a small town north of Kavála, bordering on Geton (modern-day Bulgaria), they reached the ears of a nervous yet precocious architectural apprentice named Cretheus, who had recently made an unsettling discovery of his own. He'd discovered that, in order to represent a three-dimensional space on a two-dimensional plane, it was necessary to presume an infinitesimally small point to which all lines parallel to the viewer's sight must recede. Thus, to render objects the way they appeared to the eye, heretical concepts betraying the purity of numbers must be applied.
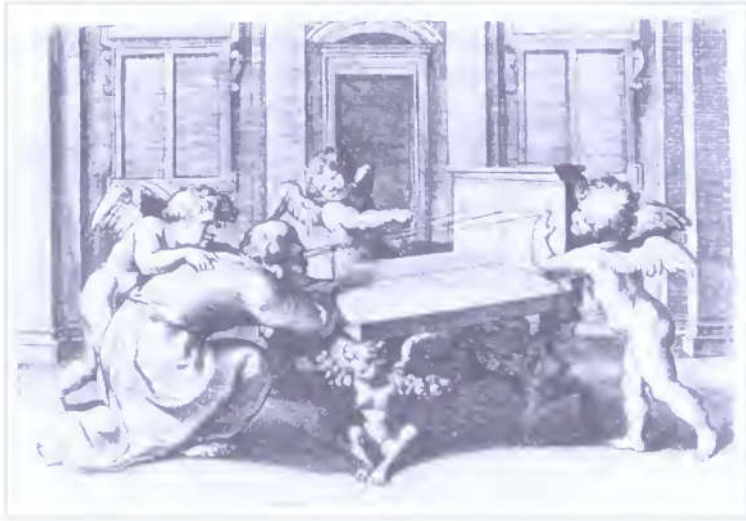
Peter Paul Rubens, Frontispiece to *Book I of Aguilonius*, 1613.

Naturally, the consequence of disclosing such truths was not at all appealing to the young draftsman, and yet how could he deny the raw facts of perspective? He resolved to design buildings whose dimensions would prove impervious to optical foreshortening. Abandon depth and there would be no infinity to recede to.

The resulting drawings were proportionally distorted. Viewed from one perspective, the structures would appear flat, while

from another they were isometric; yet from no particular angle would they seem to abide natural dimensions. If an entire city were built along anamorphic coordinates, he reasoned, the secret math could remain safely at bay.

Cretheus went to work on the model in his studio, a 20%-scale city of illusions, within which he would eat, sleep, draw and sculpt. He lived in this *trompe l'oeil* metropolis for weeks on end, expanding it, perfecting every angle and every curve. Awestruck servants would bring him mutton and berries, but often found their master too feverish with excitement to be hungry.

Still, the plan was fraught with complications. Shadows revealed depth, as did light— distant objects, he knew, appeared slightly blurry and bluer than closer ones, due to the atmosphere in between, not to mention the phenomenon of motion parallax. This last issue, the apparent shift in angular position of two or more objects relative to the observer's movement, proved especially difficult to overcome, as it was a direct by-product of binocular vision.

After several months of living in his model city, however, Cretheus awoke to find the problem suddenly and mysteriously alleviated. Buildings, temples, the stadium, the library— all appeared curiously hollow, compressed. His stereoscopy (the ability to perceive in three-dimensions) had gone, taking with it the memory of having existed at all. Shadows were not signifiers of occlusion but their own shapes, trapezoidal, parabolic, each a singular body. The vanishing points had vanished.

It was not until Cretheus finally left the miniature Papôs that he realized what had happened. Upon opening the doors to face the sun-dappled outside, he glimpsed a world he'd never before seen. Onion domes, which had previously appeared as flat ovals

in the distance, now protruded in full, shimmering rotundity. Simple gardens were vertiginous swaths of color and shade, extending far into the distance. Structures which obscured others seemed holographically projected from their backgrounds. The world was — for a brief time — a dynamic weave of focal relationships, each distance a marvelous and delicate thread. It was as if the ontology of space itself, not only his sense of geospatial orientation, had been transfigured.

It is not known whether Cretheus remained in the macroscopic world with its impure ratios or returned to the hygienic, orderly one of his own construction. What is known is that he demonstrated that it is indeed possible to eradicate the heathen numbers embedded in our visual universe — so long as the mind is fit to create its own.