Dedication

It was a large room. Full of people. All kinds.
And they had all arrived at the same building at more or less the same time.
And they were all free.
And they were all asking themselves the same question:

What is behind that curtain?

— Laurie Anderson, "Born, Never Asked", *Big Science*, 1982

Acknowledgements

The scariest thing about saying your thank-yous
is the certainty that you will leave someone out.
In the meantime... Well, there's nothing for it but:
It's a list of names, and a long one.

— Neil Gaiman, Afterword to *Sandman*, 1996

Chapter 1: Introduction

Sadly enough, surveying the status of lower bounds in computational geometry is a fairly easy task.

— Bernard Chazelle, "Computational Geometry: A Retrospective", 1994

Part I: Adversary Lower Bounds

Down with Euclid! Death to the triangles!

— Jean Dieudonné, c. 1960

An adversary means opposition and competition,
but not having an adversary means grief and loneliness.

— Zhuangzi (Chuang-tsu), c. 300 BC

Chapter 2: Affine Degeneracies

[items 1–19 omitted]
20. I have no arguments to offer, my figures are my proofs.
21. The laws of nature are in harmony with me and sustain me.
22. Laugh away these facts and truths if you can.

— Carl Theodore Heisel, *The Circle Squared Beyond Refutation*, 1934

Chapter 3: Convex Hull Problems

Everything should be made as simple as possible,
but no simpler.

— Albert Einstein

Chapter 4: Spherical Degeneracies

"...In that blessed region of Four Dimensions, shall we linger on the threshold of the Fifth, and not enter therein? Ah, no! Let us rather resolve that our ambition shall soar with our corporal ascent. Then, yielding to our intellectual onset, the gates of the Sixth Dimension shall fly open; after that a Seventh, and then an Eighth —"

How long I should have continued I know not. In vain did the Sphere, in his voice of thunder, reiterate his command of silence, and threaten me with the direst penalties if I persisted.

— Edwin Abbott, *Flatland*, 1884

Chapter 5: Linear Satisfiability Problems

"Now, even though their jumping is blind and wholly random, there are billions upon billions of atoms in every interstice, and as a consequence of this great number, their little skips and scamperings give rise to, among other things—and purely by accident—to significant configurations.... Do you know what a configuration is, blockhead?"

"No insults, please!" said Pugg. "For I am not your usual uncouth pirate, but refined and with a Ph.D., and therefore extremely high-strung."

— Stanislaw Lem (translated by Michael Kandel), "The Sixth Sally, or How Trurl and Klapaucius Created a Demon of the Second Kind to Defeat the Pirate Pugg", *The Cyberiad*, 1974

Part II: Divide and Conquer Lower Bounds

He who can properly define and divide is to be considered a god.

— Plato, c. 400 BC

Great wits are sure to madness near allied,
And thin partitions do their bounds divide.

— John Dryden, *Absalom and Achitophel*, 1681

Chapter 6: Hopcroft's Problem

"Here's to the new golden age of mathematics," Lord Vickers cried suddenly.
There was a chorus of approving remarks.
"That was the real thing!"
"Plenty of logic."
"And so many symbols!"
Lord Vickers smiled at me from across the room.
"There'll be a place for you at my new institute, Fletcher."
I took a glass of sherry.

— Rudy Rucker, "A New Golden Age", 1981

Chapter 7: Halfspace Emptiness

Here, however, a word of warning may be in order: do not *try to visualize* n*-dimensional objects for* $n \geq 4$*. Such an effort is not only doomed to failure—it may be dangerous to your mental health. (If you do succeed, then you are in trouble.) To speak of* n*-dimensional geometry with* $n \geq 4$ *simply means to speak of a certain part of algebra.*

— Vašek Chvátal, *Linear Programming*, 1983

This is wrong, and even Chvátal acknowledges the fact that the correspondence between intuitive geometric terms and algebraic machinery can be used in both ways.

— Günter Ziegler, *Lectures on Polytopes*, 1995