Trefethen's index cards

Forty years of notes about
People, Words and Mathematics

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Forty years of notes about
People, Words and Mathematics

Lloyd N. Trefethen

Mathematical Institute, University of Oxford

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For Emma and Jacob, who understand

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Foreword

Every so often a great scientist or mathematician lets us in. All the way. Not just about his work, but about everything he ponders and cares about.

He reveals who he is at heart.

Jim Watson did it in *The Double Helix*, and so did Stan Ulam in *Adventures of a Mathematician*. As a youngster reading those books I remember being shocked by both of them – for their iconoclasm, for their unapologetic brilliance, for their insider's view of science at the top, and above all, for their idiosyncratic and often startling observations about life. The effect of inhabiting a mind like this was bracing.

Now Nick Trefethen joins their ranks with this remarkable new book. It's wry, intimate, and at times, disconcerting. Nick's true self is on every page, whether wistfully describing his father's book collection as a metaphor for how alone we all are, or in ruminating about fatherhood, sex, dog toilets, and the magic of the number ten billion.

What's especially original here is the book's structure. It's a collection of thoughts and questions, some playful, some very deep, each compact enough to fit on an

index card. Nick has been writing these index cards to himself for the past 40 years. By arranging them longitudinally, he allows us to watch him unfold, captured as if by time-lapse photography, as he matures from promising teenager to the Professor of Numerical Analysis and FRS at Oxford.

Whether you're a fellow mathematician, or merely a fellow human being, you're in for a treat you'll never forget. I know of nothing else like it.

Steven Strogatz
Cornell University

Preface

This is a book about ideas, and also about one mathematician's personal development. I hope you find the mix interesting.

I was born on August 30, 1955 and started writing notes on index cards in February 1970. I remember that day, with my typewriter and a pack of 3" × 5" cards, thinking what a good thing it would be to record some thoughts that kept recurring in my mind. I was 14, a fruitful age for young philosophers, and the pack grew quickly! Later I switched to 4" × 6".

Forty years on, I'm still writing notes, having settled down to a rate of two or three a month. The basic aim hasn't changed: nothing less than to collect little nuggets of truth, to play the Glass Bead Game. Of course, as the years go by, one acquires a more realistic view of how much truth one man can muster. And I've taken growing pleasure in the sideshows — the snapshots of history, the tidy turns of phrase, the quirks of personality.

Why doesn't everybody feel the need to organize their thoughts in a card file? Half of me remains puzzled about this while the other half knows the answer pretty well.

For me, at any rate, this medium is the right one. Once I've put an idea on a card, it becomes a piece of my mental framework, a principle I will refer to for the rest of my life.

To make sense of these notes it may help to know that I was married to Anne Trefethen from 1988 to 2007 and that our children are Emma, born in 1991, and Jacob, born in 1993. I was in grade school to 1970 (Shady Hill), high school to 1973 (Phillips Exeter), university to 1977 (Harvard), graduate school to 1982 (Stanford), and then employed at NYU (1982-84), MIT (1984-91), Cornell (1991-97), and Oxford (1997-present). Thus I lived in America until 1997 and in England since then. I belong to both countries and love them both (see p. 99). Interruptions and sabbaticals took me to Australia and elsewhere in 1971-72, 1976, 1979, 1982, 1990-91, and 2003-04. By profession I am an academic, an applied mathematician. More precisely I am a numerical analyst, which means I work on algorithms for solving mathematical problems on computers.

Some of the clumsy wordings in these notes bother me, especially in the early years, as do some "he"s and "him"s. But in preparing the selection for this book, I have changed little apart from anonymizing some names, removing cross-references, and shortening here and there. The section titles and organization are new, but

the original titles of the notes themselves, those that had them, have mostly been retained. On the theory that adulthood begins at 20, I've listed my age for those notes written as a teenager, and where possible, I start each section with a note from age 14 or 15. Within each section, the ordering is chronological.

About the picture on the cover, see p. 198.

Nick Trefethen
Oxford, April 2011

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