

Preface

Roger learnt that he was seriously ill late in December 2002. When he heard this, Rick Rashid, Microsoft Senior Vice-President for Research, suggested that there should be some occasion to mark Roger's contribution to the field, and an associated publication.

In response, we proposed a one-day meeting with both technical talks and a more personal session about Roger, with the presentation of a volume of papers from Roger's many technical colleagues as the key element.

There was not much time to prepare the volume. So we asked for short papers on any technical topic of each contributor's choosing likely to be of interest to Roger. The papers could be on an area of current research, a conjecture about the future, or an historical reflection. They had to be delivered in four weeks. We much appreciated the rapid and enthusiastic responses to our invitation, and were delighted with the range of topics covered and their technical interest. We were also grateful, as each editor reviewed all the papers, for the positive spirit with which our comments and suggestions were received.

The meeting itself, 'Roger Needham: 50 and 5,' marking Roger's fifty years in Cambridge and five at Microsoft Research, took place on February 17th, 2003. The programme is given, for reference, following this Preface. The entire proceedings were recorded, publicly available at:

<http://www.research.microsoft.com/needhambook>

We would like to thank all those who wrote for the volume, and those who spoke at the meeting.

We know that Roger was very touched by how many came to the meeting, some from far away, by how many wrote for the volume and in doing so responded to his interests, by the references to his work in the technical talks, and by the accounts of his roles and contributions in the presentation session. At the end of the meeting he said:

The first thing to say is thank you very much—which is sort of obvious.

The next thing I want to say is one or two words about what I've done and what my subject is. In many sorts of engineering the theoretical background is obvious: it's continuous mathematics which comes from the 18th century. In computing there is a theoretical background and it's not obvious but it had to be invented, and people in the theoretical part of our subject have devoted themselves to inventing it—which is fine because you can't expect it to happen by itself and you can't go and build computer systems with any complexity at all without some formalised understanding to fall back on.

It is an odd thing that in my career I have contributed one or two bits to that, but that's basically not what I'm about.

I have the greatest respect for the people who build the theoretical underpinnings of our subject, and I wish them every success because it will enable the people who want to get on and make things to do it better and to do it more quickly and to do it with less mistakes—and all of this is good: but at the end of the day I am an engineer—

and so saying, he put on his engineer's hard hat. He died less than two weeks later, on March 1st.

Roger's last major talk was his Clifford Paterson Lecture 'Computer security?' at The Royal Society in November 2002. We have included its text, which is also posthumously published in the Society's *Philosophical Transactions*, as the last paper in the volume, along with a complete list of Roger's publications. We have used the classic Needham-Schroeder authentication protocol as the cover design.

The papers in this volume are as they originally appeared for the meeting, apart from some minor corrections and some small modifications, necessary in the circumstances, to specific references to Roger.

These papers address issues over the whole area of computer systems, from hardware through operating systems and middleware to applications, with their languages and their implementations, and from devices to global networks; also from many points of view, from designers to users, with lessons from the past or concerns for the future. Collectively, they illustrate what it means to be a computer system.

Acknowledgements

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