see Schmidt highlighting significant differences in topographic cross-sections between terrestrial volcanic calderas and lunar craters — which, with hindsight, should have set some alarm bells ringing. It is pleasing to see good agreement with modern-era heights for some features, *e.g.*, Mons Pico according to NASA's *LOLA* data is 2·3 km above the surrounding terrain and Schmidt gives 2·4 km. Though due to limitations of the shadow method for determining heights, this is more problematic for crater depths, but nevertheless it was interesting to see efforts at crater depth-to-diameter ratio estimation, which are used extensively in modern lunar science. He also never shies away from criticism of the fancier lunar theories at the time or dubious observations made by other well-known astronomers. Ever wondered what a 'Toise' was? In a rather valuable 'Translator's Note' chapter, Stephen Harvey describes this unit of measurement that was utilized by Schmidt throughout the book. The introductory chapter of the translation puts everything in context with a biography of Schmidt and a history of Athens observatory of which he became the director. Stephen Harvey has done an excellent job at translating Schmidt's most famous publication, and so the book should be of great value to astronomical historians and amateur astronomers interested in the Moon who wish to own this work, but cannot decipher the original in German. It is a shame, though, that the publisher has priced the book beyond the reach of most individuals. — Anthony Cook.

OBITUARY

John David Barrow (1952–2020)

Professor John David Barrow, distinguished cosmologist, physicist, mathematician, polymath, and renowned popularizer of science died on 2020 September 26, at the age of 67. With his passing, one of cosmology's brightest lights has gone out.

Throughout his extremely distinguished career John Barrow's research involved the application of sophisticated mathematical methods and deep physical insight to the problems of understanding the very early Universe. Among many other achievements, he brought new ideas and models to the theory of cosmic inflation, during which a very high vacuum energy density causes the Universe to undergo a phase of accelerated expansion. In particular he examined the behaviour of inflationary models in the presence of departures from Einstein's General Theory of Relativity and in models in which large-scale isotropy is violated. He more recently became interested in theories in which the physical constants — especially the fine-structure constant — could vary with time. Indeed, John was part of a team that claimed to detect such a variation using astronomical spectra, although this claim remains controversial.

Alongside his prolific output of academic papers he was a noted popularizer of science with more than twenty books on various subjects in astronomy, mathematics, and physics, never shying away from tackling the philosophical

and theological implications where he felt them relevant. His superb books, including *The Left Hand of Creation* (with Joe Silk), *The Book of Nothing*, *The Artful Universe*, *Pi in the Sky*, and *Impossibility*, were always beautifully written in characteristically direct and uncluttered prose. He always seemed to find writing very easy, but I know that behind this apparent facility lay a great deal of hard work and research. He immersed himself in whatever topic he was writing about and wrote very little until he knew exactly what he wanted to say.

Perhaps his most famous book was *The Anthropic Cosmological Principle*, written with Frank Tipler, which explores various ways of thinking about the relationship between the observed fact that intelligent life exists in the Universe with the nature of the physical laws that describe the behaviour of the Universe.

He was awarded the 2006 Templeton Prize for "his writings about the relationship between life and the universe, and the nature of human understanding, which have created new perspectives on questions of ultimate concern to science and religion". John never made any secret of his religious beliefs. A committed Christian, he was a member of the United Reform Church and a regular church-goer. In January of 2020 he was elected to the Pontifical Academy of Sciences.

John David Barrow was born in Wembley, in North London, in 1952. He attended Ealing Grammar School for Boys and obtained his degree in mathematics and physics from the University of Durham in 1974. He then studied for a doctorate in astrophysics, on 'Non-uniform Cosmological Models', with Dennis Sciama at Magdalen College, Oxford, completing his thesis in 1977. After spells as a Junior Research Lecturer at Christ Church, Oxford, and as a postdoctoral fellow at the University of California, Berkeley, John joined the Astronomy Centre of the University of Sussex as a lecturer in 1981, becoming a Reader in 1989 and Professor in the same year. It was during this time at Sussex (in 1985) that he became the supervisor of my own graduate studies. From 1995–99 he was Director of the Astronomy Centre at Sussex University. He then moved to Cambridge, becoming Professor of Mathematical Sciences in the Department of Applied Mathematics and Theoretical Physics, and Director of the Millennium Mathematics Project, which was awarded the Queen's Anniversary Prize for Educational Achievement in 2006. He was Gresham Professor of Astronomy in 2003–7 and of Geometry in 2008–12, the only person since 1642 to be elected to two different Gresham Professorships. He was made a Fellow of the Royal Society in 2003, and was awarded the Faraday Prize of the Royal Society in 2008, the Kelvin Medal in 2009, the Dirac Prize and Gold Medal of the Institute of Physics in 2015, and the Gold Medal of the Royal Astronomical Society in 2016.

John was an excellent all-round sportsman in his youth. He was not only a very good runner — there is a famous photograph of him beating the young Steve Ovett in a junior race — but also a talented footballer who had a trial for Chelsea Juniors. It was typical of him that he was able to perform at very high levels at whatever he turned his hand to.

I will never be able to find adequate words to express how much I owe him for his advice and encouragement not only during my graduate studies but also throughout the 35 years that have elapsed since I started my career at Sussex University under his supervision. I would like to give a couple of examples explaining why John Barrow was such a good supervisor. I was a bit stuck with the first project that John had assigned me and eventually admitted to him that I was having problems getting anywhere. I thought he'd assume I was useless

and suggest that someone else should supervise me. But no. He said he realized it was a hard problem and sometimes it's good to think about something else when you're stuck. So he asked me to look for a while at a different problem, about the clustering of rich galaxy clusters, a subject which had become topical all of a sudden. At our next meeting I told him something I had I found and he said I should write this up as a paper, which I did. Most importantly, however, the trick I used in simplifying the calculations in the clustering paper turned out to be applicable to the first problem, about hotspots in the cosmic microwave background. That led to a success in the first project and to my second paper. We were both delighted that everything turned out well with that original project. My original draft of the first paper had John Barrow's name on it, but he removed his name from the draft (as well as making a huge number of suggestions to improve the text). At the time I assumed that he took his name off because he didn't want to be associated with such an insignificant paper, but I later realized he was just being generous. It was very good for me to have a sole-author paper very early on in my career. John was co-author of the second paper. I've taken that lesson to heart and have never insisted — unlike some supervisors — in putting my name on my students' work.

John had an extraordinary mind that combined immense mathematical gifts with an encyclopaedic knowledge of all kinds of literature and a wonderful flair for expressing ideas in writing or using the spoken word. Whether they were intended for students or the general public his talks were always a model of clarity. He was a whirlwind of ideas who had an uncanny knack of finding clever ways to crack previously unsolved problems. That he was happy to share these ideas with his students is a credit to his intellectual generosity. He inspired dozens of researchers early in their careers and continued to inspire them when they became not so young.

Another point worth making is about work-life balance. People have often asked me how he managed to be so productive. Did he work very long hours? Did he push his students hard? Well, John did work hard but he knew how to manage his time. A devoted family man, he was never in the Department late at night or at weekends, preferring to spend those times with his wife Elisabeth and their three children. He certainly made it clear that he expected his students to work, but he left us space to decide for ourselves how best to organize our time. I had to take some time out during my graduate studies for personal reasons, and he was very kind and understanding about that.

On a personal level, I always found John to be rather reserved and, despite his being a talented and confident public speaker, I always felt he was quite a shy person. It is also interesting that, despite writing so many superb popular books, giving wonderful public lectures, and being a regular guest on radio programmes, he steadfastly refused to appear on television. He just didn't want to become a TV celebrity, though I suspect that if he did he would have been rather good at it. I was quite intimidated by him when I started as a graduate student, but I soon realized he was really very friendly and supportive behind the reserve.

Although I didn't see as much of John in recent years as I would have liked, I did get the chance to see and talk to him at the RAS Club fairly regularly. I always found him a very agreeable dining companion on such occasions. He had a very dry and sometimes lugubrious sense of humour. I remember sending him a congratulatory email in 2003 when I found out he had been made a Fellow of the Royal Society. He replied thanking me, but pointing out his joy at having

been elected was tempered by the fact that the first official communications he got from Carlton House was a rather substantial bill for the subscription and a form on which to enter details to be used in an obituary.

During my time as his student at Sussex we found a mutual interest in football, which we often talked about at coffee breaks. We even played together a number of times, often on a horrendous all-weather pitch on the Sussex campus. Despite not playing very regularly, he was energetic, skillful, and industrious, with very good tactical sense, though he wasn't a natural goal-scorer. In later years when we had the chance to chat, such as those occasions at the RAS Club, it was more often than not football that we talked about rather than science.

It was through the RAS Club that I first heard that John was suffering from cancer. For a time he responded well to treatment then his condition deteriorated to the extent that only palliative care was possible. That news came as a shock as he always seemed so healthy and ageless that one imagined him to be indestructible. The end came more quickly than we had imagined but at least he was at home among his loved ones when he passed away peacefully. Rest in peace, John. — Peter Coles.

OBITUARY NOTICE

Roger Francis Griffin (*1935–2021*)

The Editors of *The Observatory* have been deeply saddened to learn of the death of Roger Griffin on 2021 February 12. We are sure that these feelings will be echoed by many readers of this *Magazine* given Roger's long association with it, as both an Editor and an amazingly productive contributor, with his astounding series of 265 papers on spectroscopic binaries. It is intended that a full obituary will appear in a forthcoming issue.

Here and There

THAT DEPENDS ON HOW HARD YOU THROW THEM.

Advanced *LIGO*, housed in tunnels in Louisiana and Washington state, works by measuring how long it takes lasers to travel to a distant mirror. — *Discover Magazine*, January/February, 2021, p 66.