

*In Memoriam*

Vivian Moses

17<sup>th</sup> May 1928 – 27<sup>th</sup> December 2017



## CELEBRATION OF THE LIFE OF PROFESSOR VIVIAN MOSES AND THE AWARDING OF THE INAUGURAL VIVIAN MOSES PRIZE

Introduction: Sue Cunningham

Welcome and prize awarding: Professor Richard Pickersgill

Perspectives on Vivian Moses: Dr Brendan Curran  
Jonathon Harrington  
Howard Moore

Music by North London Symphony Orchestra:

*Octet* in E-flat major by Ludwig van Beethoven, Op. 103

1. Allegro, 2. Andante, 4. Presto

*Waltzing Matilda* (Arranged for Wind Quintet by Marie Cowan and Fiona Hickie)

Closing words: Rupert Cunningham

*Refreshments will be available until 7 pm*

North London Symphony Orchestra, founded 1947, is an ambitious non-professional orchestra performing at a variety of venues in North London. For many years associated with Haringey Borough, the orchestra became independent in 1987 and took its current name in 1995. From its early days the orchestra has engaged soloists of the highest calibre, including Dennis Brain, Alfredo Campoli and Gervase de Peyer. It has also frequently given a platform to young people who have gone on to be front-rank performers, among them Nigel Kennedy, Tasmin Little, Howard Shelley, Raphael Wallfisch and Emma Johnson. This practice has continued in recent years, with soloists including Valeriy Sokolov, Alexei Kiseliov, Mathilde Milwidsky, Roger Chase, and James Kirby. In January 2017, professional conductor and cellist Robert Max took over as conductor and is leading the orchestra through a new phase of development.

Oboe:	Clarinet:	Bassoon:	Horn:
Lysander Tennant	Michael Coxall	Sheila Wallace	Laurence Clarke
Sue Knight	Denise Burns	Kriskin Allum	Joe Huybens

*Vivian's family wishes to thank NLSO's Chairman, Michael Coxall, and today's performers for all their help in making possible this programme of music.*



He was a wonderful husband and father. In some ways I feel that as long as I am still living he will not cease to exist. I still talk to him and feel that he knows what I'm doing.

- Sheila Moses

## An Ode to My Father

There is too much to remember and, alas, much forgotten.  
So, herewith some moments, some vignettes of the many years I was so fortunate to have my father.

My earliest memory when very small  
Was sitting on my father's shoulders dancing to Waltzing Matilda.  
He promised he would take me to that far away land one day – with koalas and kangaroos.  
Who knew that, 40 years later, I would find myself living in Australia?

In Kensington, on the hills above Berkeley, where we lived when I was a child,  
My father would play Lilliburlero on the World Service at 7pm;  
Our notice of the time for bed.

From trips back to London my father would return with the essentials of life:  
Heinz sandwich spread and tins of baked beans.

Fast forward to life in London where we moved – he returned – in 1971.  
Cases included not only furniture, clothes et al, but also the vital packets, in abundance, of Kraft macaroni cheese!

The first task at hand, once settled in London, was to convince my father of the wisdom of a puppy.  
He was not entirely convinced until the cunning plan was hatched that he should name our new resident.  
Angus, inspired by 'Angus and the Ducks', soon became part of our lives, our 'wiggie' as my father would say. He was smitten!

The second campaign related to the acquisition of a colour television. That took somewhat longer, but finally was achieved.

On my thirteenth birthday a special treat –  
Dinner at the newly arrived McDonalds in Islington.  
My father took my brother and me.  
Big Macs, milkshakes, and fries.  
But no, milkshakes *and* fries was deemed excessive; one or the other!

My father was always there.  
He was a source of wise counsel and unstinting love.

He was not a deeply demonstrative man;  
On parting he would offer a cheek to be kissed.  
Bear hugs were not his style.

But his love was all enveloping.  
He helped me discover who I am.  
I remember, relative to my brother who displayed such certainty and focus,  
My father helped me explore different pursuits until we found the one I loved –  
the theatre.  
He shared his passion for Wagner with me, taking me to Rienzi and Die  
Meistersinger – alas, I was more intrigued by the stage sets than the music.  
Even so, it sowed the seed, one that I pursued through college and my early  
career.



When I first started working in universities, I turned to my father to seek his  
advice.  
He told me there are three things I should always remember, and I would not go  
wrong:  
Universities are for academics  
They are run by academics  
And one should never be paid more than the academics.

As my life and journey took me to Wales, to Scotland, to Oxford, to Melbourne,  
to Washington DC, my father was always interested, supportive and would  
arrange for him and my mother to come and visit.  
Not that he was one, until his final months, for simply putting his feet up.  
Rather, he would want to venture out and discover the environs, colleagues and  
long-lost relatives.

One of my father's greatest personal joys, I believe, was his relationship with my son, Rupert.

The journey began, as my father would have said, when Rupert had something interesting to say.

From then on, my father and Rupert connected on many subjects, on science, on politics, on any matter that could be debated.

I remember when Rupert was at school and tackling some difficult biology homework. He wanted my father's advice. At the time, his grandparents were visiting Washington DC. When Rupert called, my father answered, and provided the required input as he strolled around one of the Smithsonian museums.

My father was hungry to travel the world – well, the parts where he could find a meal and culture he would enjoy! Whilst the Icelandic volcano erupted in 2010 he led a journey of three generations – himself, my husband, Howard, and Rupert to Israel. Due to the volcanic disruption on their return he led the group across land from Zurich back to the UK, availing himself of some Wiener Schnitzel en route. And his final trip, with Howard as a much loved companion, was to conquer his three remaining US states (North Dakota, South Dakota and Arkansas) – staying at economical hotels along the way, of course!

One of the hardest things my father did, I realise now, but months before he died, was to ask me to take control of my parents' finances. He was always so organised, so fiscally and administratively reliable and effective. To do that he truly knew what was to come and took the time to coach me through the labyrinth of carefully documented information I needed to know.

My father loved many things. His family, his colleagues, his work, his family history, Yiddish, his red velvet armchair (which now has pride of place in our home), the BBC news and the endless opportunity to learn, to comment, to debate, to read. There were also things he did not like – garlic probably chief amongst them, closely followed by any food he would have considered 'adventurous'.

I feel his loss profoundly. I have lost so much with his passing – he was my oracle, my rock, my father. I am who I am in no small part because of all he taught me: to be honest, to take one's work seriously as opposed to oneself, to be interested in the people and the world around me. I have learned through the many messages on his passing how many held him in high esteem. So much of what he said and what he did lives on in the hearts and minds of very many.

- Sue Cunningham

The finest quality in man is that he should be an inquirer

(Solomon Ibn Gabirol's *Choice of Pearls, Wisdom I, 44*)

Vivian Moses was born in the East End of London in 1928. His father, Shloime, was a Polish immigrant and his mother, Bessie (née Brodetsky), was born in Britain to a family which had emigrated from Ukraine. He went to Dame Alice Owen's School for Boys in Islington, north London and experienced what he described as a great adventure when he was evacuated during the Second World War to Bedford. His love for science and music grew in equal measure during his teenage years. The BBC Symphony Orchestra had also been evacuated to Bedford and he attended many of its concerts at the town's Corn Exchange and the Great Hall of Bedford School. He was also thrilled to see many of the Proms 1944 series when they were moved from London to Bedford as doodle-bugs started to rain down on the capital. This love of 'The Proms' and all its rituals stayed with him for life. He was keen on chemistry but – as his sister recalls – that had caused a bit of a mess at home so he turned to biology, instead bringing home frogs and earthworms for dissection (which similarly wreaked havoc in the kitchen!). He went up to Peterhouse, Cambridge in 1946 and graduated with his BA in Biochemistry and later completed a PhD at University College London in 1953 in Microbiology.

He stayed on at University College London as a junior lecturer for three years. As he himself said, he was then very fortunate to secure a postdoctoral appointment with Melvin Calvin at the University of California in Berkeley, joining his group on photosynthesis research (for which Calvin was awarded the Nobel Prize in 1961) and other metabolic problems. He briefly returned to the UK to another two-year postdoctoral appointment with Mervyn Smith to work as part of the newly formed Arthritis and Rheumatism Research Unit on Drug Metabolism at King's College Medical School, London.

As tenured academic science jobs were difficult to come by in Britain in 1960, Vivian became an early leader in the 'brain drain' when Melvin Calvin invited him to return to Berkeley on a permanent basis as a research director. Vivian concentrated first mainly on metabolic compartmentation and later on microbial enzyme synthesis, particularly catabolite repression of the lac operon system in *Escherichia coli*. He returned to Britain for a sabbatical year (1967–1968) at the University of Oxford, working with Joel Mandelstam and Michael Yudkin.

At heart he always was a Londoner and he proved the truth of Horace's maxim, that:

caelum, non animum mutant, qui trans mare currunt.

*Those who go across the sea,  
Change the sky, but not their hearts.*

(Horace: *Epistles I, 1, 27*)

In 1971 he returned to London when he was made Professor of Microbiology at Queen Mary College, a position that he held for 22 years. During his tenure, he became progressively more involved with the new and rapidly developing field of biotechnology, organizing, co-authoring, and jointly editing the major textbook *Biotechnology – The Science and the Business* (London, New York and Chur: Harwood Academic Publishers: 1991; 2<sup>nd</sup> edition, 1999), in which engineering, commercial, and legal considerations were discussed alongside the science. Also during that period, he co-founded Archaeus Technology Group Ltd, a small biotechnology start-up company exploring the use of microbiology for improving the recovery of crude oil from reservoirs.

From 1990 to 2000, he was life sciences editor for the magazine *Science Spectra* (now discontinued) while pursuing his biotechnology activities. In 1991 he co-authored with his wife, Sheila Moses, *Biotechnology in Industry, Healthcare and the Environment* (Special Report No. 2178: London, Economist Intelligence Unit, 1991).

In 1996 he co-founded The Centre for Genetic Anthropology at University College London and served as its director for ten years. Between 1997 and 2008 he conceived and coordinated three major European Union projects on biotechnology and its relationship with the general public. Since 1999 he was the chairman of CropGen, a consumer and media information initiative that helped to achieve a greater measure of realism and better balance in the UK's public discussions on biotechnology in agriculture and food; in that capacity he addressed many public and private meetings as well as participating dozens of times in radio and television programs.

Having for many years recognized the immense significance of the Bio-Organic chemistry group of scientists and colleagues and its remarkable record of interdisciplinary collaboration in Berkeley (later becoming Chemical Biodynamics and now the division of Biochemistry, Biophysics and Structural Biology), Vivian, together with his wife, in 1995-1997 undertook an oral history of the group, interviewing more than fifty people who had been instrumental in



the development of the laboratory in its early post-war and main developmental period from 1945 to 1963. Today, UC Berkeley's Bancroft Library is the repository for copies of all the tapes and the transcripts (online transcriptions of those interviews can also be found at Internet Archive).

All who worked with Vivian or came in to contact with him always were struck by his larger-than-life presence. At any kind of occasion he could always be relied upon to give an entertaining, thoughtful, memorable speech. Indeed, people often mentioned that he possessed a gift rare among scientists of being able to explain complicated issues in simple language.

He occupied a very special and cherished place in the hearts of his family and his many friends. He was a great person with a wonderful, sharp sense of humour and proportion and a great promoter of science, progress, and open debate. At all times he showed a strong sense of loyalty to those with whom he worked. As one person, who wrote to the family after his death, succinctly put it: "He was a Good Man [sic] and warrior for the truth." Another warmly observed: "They don't make 'em like that anymore!"



Outside of work and in retirement he kept engaged in a wide range of interests (too many to recount in all here). He had been attending for some time Yiddish lessons (the language of his father), as well as keeping up his Russian. From time to time he visited the National Tram Museum at Crich in Derbyshire or, closer to

home, the London Transport Museum in Covent Garden to reminisce and bring back memories of the 31, 33 and 35 trams of north London. Indeed, when he visited his daughter in Melbourne, Australia, in 2013, he was over the moon to be riding around on the world's largest urban tramway network. Only last summer did he return to America not only to visit friends and family but also to travel to Arkansas, South and North Dakota to qualify for the 'All Fifty States Club'. As was his annual custom in July and August, in 2017 he attended eight Proms and recounted with joy the great performance of the BBC Symphony Orchestra of Mussorgsky's *Khovanchina*. However, to his mind no Prom measured up to the one devoted to the truly magnificent, spectacular – and rare – performance of Havergal Brian's gargantuan First Symphony (*The Gothic*) in 2011. That said, for Vivian nothing could surpass the musical output of Wagner. Every Good Friday Vivian would listen to the 'Good Friday Scene' from *Parsifal* that occurs just before Gurnemanz, Parsifal and Kundry enter the majestic hall of the Grail; there is a sense of nobility and extraordinary beauty in the music, a sense of constantly searching.

Vivian Moses, microbiologist and biochemist: born London 17 May 1928; Senior Scientist, Laboratory of Chemical Biodynamics, University of California, Berkeley 1960-1971 (Associate Director 1970-1); DSc in Microbiology, University College, London, 1971; Professor of Microbiology, Queen Mary and Westfield College, London 1971-1993 (Head of School of Biological Sciences 1987-1991); DSc, University College London (1971); Science Director, Archaeus Technology Group Ltd, Surrey 1987-1994; Visiting Professor in Biotechnology, King's College, London 1993-2017; Director, The Centre for Genetic Anthropology, University College London 1996-2006; Visiting Professor in Biology, University College London 1996-2017; Chairman CropGen, London 2000 onwards; Honorary Fellow, Science Museum, London 2008 onwards; author or co-author of about 190 original research papers, reviews, articles and books (along with others edited or co-edited); married 1955 Sheila Shine (one son, Kevin, one daughter, Susan, one dog, Angus, several guinea pigs); died London 27 December 2017; buried at the Federation of Synagogues Rainham Cemetery in the London Borough of Havering in accordance with Jewish tradition on 28 December 2017; he is survived by: his wife, Sheila, who recently moved to Virginia, America in order to be closer to her daughter; his sister, Naomi, resides in the UK; his son, Kevin, and daughter, Susan, who both live and work in America; and his grandsons, Daniel and Rupert.

*[Edited and abridged versions of this piece appeared in: The Times; The Jewish Chronicle; East Bay Times (California)]*

- Howard Moore

I first met Vivian when I was introduced to him at a conference at The Royal Society in the early 1980s.

Our association was very much that of 'work pals' and we had lengthy chats when we met ad hoc in offices, common rooms and corridors, usually about microbiology/biotechnology topics of current interest, or academia and students, plus the tales of his travels linked to his work on GM foods and latterly on his interviews of 'eminent scientists' for The Royal Society. It was only while writing this, that I discovered my husband (Don Kelly) was one of them...

I felt Vivian was very much the devil's advocate in some respects, as he would throw in a 'rogue' comment about a controversial issue (not just GM crops) – I suspect to see my reaction. I was probably a disappointment as I rarely rose to the bait – and usually asked him what the 'latest developments' were, as I could rely on him to be well ahead of the biotechnology curve.

I hope he liked me as much as I liked him. I like to think so, as we met up a few times after my retirement mid-2015. Both times were in pubs for lunch when the most important aspects were the conversation and exchange of ideas and information. Vivian was a masterful conversationalist and could talk about pretty much anything and everything.

Our penultimate meeting mid-2015 was in The Churchill on Kensington Church Street with the retired 'old codgers' from KCL Kensington campus. My last contact with Vivian was over a sandwich lunch at The King's Arms on Newcomen St, behind Borough High Street and Guy's campus. That final meeting was just the two of us and I shall remember him with respect and affection because he was prepared to spend a few hours chatting with just me alone, and felt my ideas and information were worthy of his attention.

As well as being a scientist and educator, Vivian was a gentleman, philosopher and pragmatist. We can tell people as many facts as we have to help educate and inform, but in the end they make their decisions based on their own prejudices. He certainly played his part in informing and educating future generations.

- Ann Wood



Vivian was the solid, stable one in our family. It was good to be part of his clan. He was charming and usually had something witty or rhyming to add to any conversation. He loved London and classical music, car trips and visiting all 50 states in the USA. I miss him dearly; he will not be forgotten.

- Carol Moses

We shared a Yiddish class at UCL not always regularly, being both “mature” students. But always looking forward to seeing him there as his curiosity and interests coloured and added weight the lessons.

I feel lucky to have seen him shortly before he died bringing him a book sent by our teacher. He spoke about all the many relatives who worry about him and not wanting to be a burden. But still was interested in what was going on.

And I just feel lucky to have met him.

- Nogah Wilson

Because I was at QEC (Queen Elizabeth College) until 1996, on the other side of London, I saw relatively little of Vivian. The last time I saw him was a few years ago in an Italian restaurant near Victoria at one of the ‘Beer mats’ lunches (!), when ex-QEC microbiologists and friends met and reminisced. I had a very long conversation with Vivian. He was on great form and that is how I will remember him – insightful, interesting, and entertaining. His is a great loss to Microbiology.

- Robert Poole

Vivian was one of the most wonderful people I met in my life, and from very early days we shared a deep friendship. I had the huge privilege of knowing him from the time of my first appointment to Queen Mary College in 1988, and I have always regarded him as a dear friend and mentor. He combined a towering intellect with a deep love of people, and he took great interest in the development of young members of staff. Vivian always affectionately referred to me as ‘young Brendan’ and bore my many shortcomings with a father’s love. He had a deep understanding of human nature and he cared deeply about others. On one occasion, when in Dublin at a biotechnology conference, he insisted on visiting my mother who was living in a retirement home on the outskirts of the city. He smiled as we left saying, “I think your mother enjoyed that. She will be telling the nuns about the visit from the professor from London for some time to come!” This anecdote captures Vivian’s essence: here was a man attending a high-level academic meeting but making time to visit an old lady he did not know, just because he cared. Thoughtful, insightful, kind and caring but with a great sense of humour, Vivian Moses’s towering intellect was exceeded only by the size of his heart. It was always such a huge privilege and pleasure to be in his company.

I miss him greatly.

- Brendan Curran



In my eyes as a child (and even as an adult), Vivi 'knew everything' and I used to go to him for explanations and occasionally did so even until quite recently. I always got very concise and easy to understand answers. Apart from the obvious loss, I miss that an awful lot.

Here's one memory which is still very vivid. It happened during the war when we were evacuated to Bedford. I suppose he must've been around 15 at the time, making me 7. He was experimenting with something in the kitchen, which we shared with the householders. What I remember is that I opened the kitchen door and popped my head in just at the moment of an explosion and a little bit of glass cut my ear lobe very slightly. Periodically for several years afterwards, my ear lobe used to get sore but is well healed by now. I also have a hazy memory of my mother using cold tea leaves (no tea bags in those days), presumably where he had got burnt.

I'm sorry but I don't remember what the experiment was about but obviously it was in the early days of him becoming a budding scientist. As far as I know that was the only time an experiment went wrong but who knows, there might have been others.

- Naomi Almor

I met Vivian through his interest in the Farm Scale Evaluations of GM crops established by the government in 1999. I took part in all four years of the trials, the first being the year that the protocols were developed and agreed. I then did three years of winter and spring oilseed rape trials, making myself available for media to see and discuss the outcomes as they became obvious. As always, the trials were fixed but it was obvious to me that, if we had been allowed to continue, the timings and rates could be modified to show greater benefit.

There were follow-up investigations over the following two years to see if any negative outcomes were evident. I had collected all the evidence of actions taken and rates used in annual diaries, which Vivian felt were worth collecting and arranged for them to be retained in the British Library for future reference. As we all know the hope that I had of the technology being used and developed in the UK and Europe has not occurred.

- Bob Fiddaman

As a Yank and a Public Policy Scholar at the Woodrow Wilson International Center for Scholars, I spent 2000-2001 in London researching a book on the genetically modified food debate and its implications for emerging technologies like nanotech.

I was fortunate to meet Vivian who was unfailingly generous with his ideas, perceptions, and introductions. He foresaw today's science wars. Vivian was among the few at the time to grasp the importance of researchers standing up for science, speaking truth to power and publics. He didn't care about being maligned by the press or anti-GMO campaigners. He dismissed criticism by his less enlightened colleagues who then saw public debate and engagement as beneath them and potentially harmful to their professional reputations.

Gratefully, he and Sheila went on to become friends. Science and I personally owe Vivian so much.

- Julia Moore

I remember Vivian Moses as being an exceptionally well-organized man, who liked life to run in an orderly and systematic manner. He had a meticulous mind, a keen eye for detail, and loved figures, statistics, and data. To this date he is the only person that I have encountered who not only recorded the day's weather and temperatures, but then cross-referenced those figures with daily meter readings for gas and electricity consumption!

On one occasion when I was staying at the family home in London he arrived at the breakfast table in jubilant mood. On awakening that morning he'd switched the bedside radio on to discover it not working. He checked the leads and the power supply. Still nothing. Never mind, he reflected to Sheila, that little transistor radio set had served them well, having been purchased in the late 1960s on their return to England after a period of living in the USA. He could even remember the shop in which they'd bought it, and recall the price paid. Sheila disagreed. They'd purchased the radio set at a much later date, and at a different retailer. Handing her his watch he requested she record the time as he headed off to the filing cabinet in his office to gather evidence. 2 minutes and 20 seconds later (precisely) he returned triumphant, brandishing not only the original receipt, but the manufacturers handbook too. And he was right! No matter that the radio set had failed, the filing system worked!

- Chris Cunningham





For many years, Vivian led a project studying and researching the possibilities of using bacteria to assist the extraction of crude oil. I had immense admiration for him for gaining an interview with a leading BP executive. He had to explain why we thought that BP and others should spend a lot of money on our project, designed to put bacteria into oil wells when, normally, petroleum engineers spend lots of effort and money keeping them out. (We never got a great deal of money from BP but they did set up their own team to look into the matter.)

Vivian and I wrote a book which a specialist publisher produced as spirally-bound duplicated sheets in a paper cover. Hitzman, who worked for Phillips Petroleum, persuaded his employer to buy one of the few copies sold. He said they created a fuss over the price, which was well over \$2000, but he said it was exactly what was needed to stimulate research at the time.

We went to a conference on enhanced oil recovery at a very palatial conference centre in Oklahoma. A group of us used to go out for an early morning walk in the extensive grounds. On one occasion, we came to a hut manned by an armed guard. He forbade us to go any further, and we gained the impression that, if necessary, he would shoot us to enforce his commands. We retreated with as much dignity as possible. For some reason, the conference ended a day earlier than advertised. A representative from BP offered to fund the entertainment. We went to ask what delights were available, but it turned out that the best attraction was a craft exhibition.

Unfortunately, our dreams of solving the world's oil shortage came to nothing when the oil price collapsed in the 1980s, and spending money on schemes to extract more became unappealing.

- Derek Springham

I knew Vivian for about 40 years as both a colleague and friend. Our paths crossed many times on University of London Boards of Study in Microbiology and Biotechnology, which we have both chaired from time to time. This led to the organisation of a University of London Biotechnology Day. He was involved, with Professors John Pirt and Michael Bazin, in the development of a B.Sc. in Biotechnology, which was set up at Queen Elizabeth College, London University in 1982. This continued when QEC merged with King's College London in 1985 and Professor Moses was appointed as a Visiting Professor in Biotechnology in 1993. He added an industrial and financial component to this degree with speakers invited from industry and the inauguration of the popular Barclays Bank Investment Game for the Biotechnology Students. In the middle of the 1980s, Professor Moses and Professor Alan Bevan invited me to give a Special

Research Lecture to the Biological Sciences Department at Queen Mary College (later Queen Mary University of London). Their hospitality beforehand was very lavish, which they admitted was designed to make the lecturer somewhat inebriated and more likely to commit indiscretions or to fall off the podium, so waking up the audience.

About 15 years ago, we were delighted when he joined a group of QEC/King's College London retired academics who met monthly in The Churchill Arms in Kensington. His contributions to this group were always original and perceptive and it was a pleasure to have discussions with him. He talked about his time in Berkeley and he added interesting background to his research time there. We were made aware of his recent and long-term commitment to the international promotion of his views on GM agricultural crops as well as his contributions to Genetics and Biotechnology. He had strong views on the European Union which he felt that we should leave, but felt that he wouldn't trust the current politicians to take us out. So far he has been proved exactly correct on this. He told us about his evacuation to Bedford during the Second World War which he really enjoyed, especially the orchestral music. He had returned to several reunions. We shared experiences of our membership of different German Conversation Groups (one in North London and the other in Leighton Buzzard, Beds.) and talked about what topics were discussed.

Vivian was excellent, stimulating company and we really valued his time with us. The group is not the same without him and I miss having our discussions and reminiscences with him. Truly an exceptional polymath and a genuine human being.

- Brian W Bainbridge

I worked with Vivian as a co-editor of GM Crops and Food since 2010 and have known him for more than 25 years. Vivian was a great friend and a great scientist. His knowledge of science and passion for it was second to none. His sense of humour was brilliant and yet subtle. I learnt much from him, and always was in awe for his keen insights. I looked up to him and he was always ready to help, provide his valuable insights and share his ideas. He touched many people in his long life and had friends all around the world. I truly miss him.

- Channa Prakash



It is said that when one door closes another one opens and in May 2001 a door on a new world opened for me in that I met for the first time a man I would come to regard as a favoured 'Uncle'.

Like many of you I had seen Vivian appear on the BBC as a guest on such programmes as 'Newsnight' and being interviewed by a miscellany of journalists regarding the then potentially scary subject of Genetic Modification (GM) of agricultural crops. Also, rather like many of you, I was more than a little bemused by the fuss in the media about the way in which this relatively new technology was being misunderstood.

Vivian and I were once invited to appear on a panel at The Hay Festival debating the adoption of the technology and I found in him that rare character, someone

who rarely if ever spoke down to those who were not of his academic equal but who could deal with all in the same way as if he were discussing politics or sport or even Brexit! Indeed, within a matter of weeks he was calling me his “mate”! I tried to return the compliment by calling him Uncle Vivian and by the end of the year we had become more than just friends.

The door he opened was one into a world I had never explored, and he invited me to join a panel of people so far removed from my own academic level as to make me feel I had stepped “through a looking glass”!

We went to conferences, attended debates, and came to rely on each other for explanations of such things as mutagenesis, lodging, embryo rescue, crop volunteers, and why even farmers had such little knowledge of how new crop varieties were bred. I asked him once why God has not managed to do a better job of designing photosynthesis and his answer was quite simple: “Perhaps he did the best job he could with the tools available”!

He would often respond in such terms when asked for his opinion which in many ways demonstrated why his opinion was sought so frequently by those who did not really understand the science involved behind such things. Kipling’s most famous poem includes the lines:

*If you can talk with crowds and keep your virtue,  
Or walk with Kings – nor lose the common touch,*

In many ways this summed up him up.

In 2005 Vivian and Sheila took me in whilst I took part in the London Marathon and then when later that year I broke my back came to my rescue in finding me work and, indeed, he continued to help and support me over the next 15 years or so whilst I recovered.

I came to regard Vivian as “King amongst Men” and, although he could on occasions become a little ill-tempered, it was only ever with those he would describe as people “who should know better”. I can honestly say that knowing Uncle Vivian was more than a privilege; it was a pleasure, and education, and an honour.

Thank you, Vivian, for all you did whilst you were with us; I promise you that the lessons you demonstrated have been well learnt.

- Jonathon Harrington

The year was 1956. Vivian was doing a post-doc under Nobel Prize Winner, Dr Melvin Calvin. It was through his wife Sheila, with whom I worked, that I met Vivian. We became very good friends and our families often spent time together. In fact, my daughter and Susan became quite the “pair” and enjoyed having many playdates.

I loved Vivian's humour, he always made me smile. I also loved that he enjoyed speaking Yiddish. He often encouraged me to respond to him in Yiddish, but it had been so long since I spoke that language, that I was terribly embarrassed. Vivian was the only person who ever called me “Thornwall”, which was the phone number prefix for Record City before the prefixes became numbers.

I visited Vivian and Sheila in London some years ago and have very fond memories of that trip. Vivian was so anxious for me to have many experiences in the city that he loved so much. We ate really well (my first time being treated to fish ‘n’ chips), heard good music, went to theatre, did tourist-style walking, and just so much enjoyed each other’s company the whole time.

Vivian was an amazing traveller. I'm pretty sure that I heard that he visited all of the states in the U.S. He and Sheila enjoyed travelling all over Europe and (I think) Asia. Also, each time Vivian came to Berkeley for work, he would invite me to have lunch with him. Those times were very enjoyable.

In closing, I want to say that Vivian was a very kind and thoughtful man. In other words, a real “mensch”, who will be missed in this world.

- Helen Schneider



I remember his teaching as always fascinating and being delivered with great humour. I also remember his tutorials very clearly for the enthusiasm they raised and the questions that stretched the mind. Because of the economics of the '70s I didn't make my career in Microbiology. However, I have followed its development closely and, following retirement, I am now chairman of an environmental charity, so much of that enthusiasm has stayed with me.

- Trefor Hogg

I can no longer remember when Vivian started attending my Yiddish language and literature classes at UCL. He was an inspired member of a lively group of students of all ages and backgrounds who came to classes for many years, as did Sheila.

Vivian's engagement with Yiddish often intersected with his own family history and with a broader transnational understanding. I can also recall sessions in which Vivian would try to explain his scientific work in Yiddish to our students. The last time I spoke Yiddish with Vivian was when he was at University College Hospital. Although extremely ill, he was as sharp and engaged as ever.

We miss him and will continue to do so.

- Helen Beer

The following appreciation is a compilation by David Bignell. Standard text is from the "official" brief obituary which has been included in College Bulletins. Other comments are interpolated between these paragraphs, but in quotation marks and italics. The comments are not attributed, though in some cases the author can be easily identified, and some remarks are edited.

We also remember and thank Professor Moses, who under the terms of his Will has left the School of Biological and Chemical Sciences (SBCS) at Queen Mary College a legacy of £10,000. This is to be disbursed each year for a period of ten years in an approximately equal amount to such members of the academic staff, postgraduate researchers or postdoctoral scientists active in research (in any area of Microbiology, Molecular Biology, Biochemistry or Genetics) who have significantly advanced their subject.

*"Vivian modernised the old Botany and Microbiology Department, something for which I can personally be most grateful, as the equipment he purchased and subsequently never used (a large number of unused Warburg manometers in*

*pristine condition) enabled me to revise the global terrestrial carbon cycle by 15%.”*

Vivian graduated BA in Biochemistry at Cambridge (1949). Before and after his first degree he had short jobs in which he developed practical skills in Microbiology, and eventually achieved a PhD in Microbiology at UCL (1953). After 3 years as Assistant Lecturer at UCL, he moved as a PDRA to work at the lab in California of Melvin Calvin (whose work on the carbon fixation path of photosynthesis was recognised by a Nobel Prize). Later he was a research director in that lab; a total (with short gaps) of 11 years there.

In 1971 he returned to Britain as Professor of Microbiology at QMC, a post he occupied for 22 years until his retirement in 1993. His interests at QMC shifted to the development of biotechnology, which he defined as ‘making money with biology’. He was a founder in 1971 of Archaeus: a small biotechnology company devoted to commercialising the use of microbes to increase the flow of oil (partly by producing surfactants that reduce its viscosity). And he was an author of a major textbook, ‘Biotechnology – the Science and the Business’ (1991).



*“I am really very sorry indeed to hear this sad news. Vivian appointed me as a Temporary Lecturer in Microbiology at “QMC” in 1971 on the basis of an interview held in Calvin’s lab in Berkeley. He and I didn’t see eye to eye on all things over the years, but we seemed to agree on most important issues*



*including the shared opinion that Microbiology was not primarily the study of medically significant micro-organisms. He also tolerated my occasional outbursts of indignation when discussing with him some opinions we didn't share."*

*"In retrospect Vivian brought modernity first to a Department and later to a School that needed it."*

*"I was a Student at Queen Mary when he arrived, and I guess lived through the early days of change when the concept of change management did not exist. They were balmy days - turbulent and great fun. There were great arguments with Bev shouting down corridors and Viv ignoring it all. Viv really did shake up thinking and initiatives like Biotech got started and new sorts of money came in. I found Viv a breath of fresh air. In those days he did a lot for SBS but he was not always recognised. I spoke last week with an old College engineering Prof now well retired who spoke highly of Viv as a Dean and senior member of the College, though others in the College might not have agreed. I look back on Viv as an inspirational person who challenged you and taught me to think a bit more out of the box. I do hope the School or College do something to remember him."*

From 1987 to 1991 he was Head of the School of Biological Sciences at a time when senior management of the college was experiencing difficulties that affected us all. He was one of the first in SBS to introduce a desktop computer – an Amstrad – though that make was soon superseded by IBM and Apple.

*"I can recall many positives. Vivian was congenial, calm and easy to approach. He was an excellent speaker. I recall his addresses to first year students at their registration: solely focussed on the excitement of doing science."*

*"I was on one occasion summoned to his office, a heart-stopping moment for any junior academic at a time of financial crisis. He showed me an 8-page handwritten diatribe from a colleague complaining about my behaviour (I was running a short-lived Master's course at the time and had commandeered space which the colleague considered his own). Vivian asked what he should do and I replied, "tear it up". He instantly rose from his chair and dropped the offending item into his waste paper basket."*

After 'retirement' he held visiting posts at UCL and KCL, and, as chairman (from 1999) of the biotechnology-funded lobby group CropGen, became a well-known

public advocate for the use of genetic modification in crop plants. In this final role he excelled in explaining complex things simply to a wider public.

- David Bignell, Dicky Clymo, Steve Ketteridge, Roger Evans, Peter Newell, Rob Hughes, John Robinson



We have been remembering Vivian with great affection. Peter has been telling me what an influence, big brother, and role-model he was for him. I enjoyed his humour, our pigeon-Russian conversations, our castles in the air about exotic travels, and our disagreements (I mean discussions). I admired not only his boundless curiosity, his energy, and his adventurous spirit but also learned something from his down-to-earth common sense and his practical approach to life. It was wonderful that he felt he had done all the things he had hoped to do. And how glad Howard must be to have shared that last trip together. I shall miss him very much. He was such good company.

- Marion and Peter Maitlis

Vivian was a dear colleague of mine and many Lexington consultants over a period of over 15 years through our work together with the Agricultural Biotechnology Council. He had a gift rare among scientists of being able to explain complicated issues in simple language. But he also had a keen sense of humour and a strong sense of loyalty to the people he worked with.

- Mike Craven

On behalf of a group of Vivian's biological colleagues, I should like to convey to you our sincerest condolences on the death of our friend Vivian. We are a mixed

bunch of biologists, formerly associated with King's College, who call ourselves the BOFS (Biological Old Farts), and who meet every month at The Churchill pub in Kensington. Vivian regularly attended our little get-togethers where we consumed modest half-pints of beer and indulged in much serious discussion mainly about matters of concern to biologists, but also about our families and their various activities.

Vivian's contributions were always valuable and we are going to miss his wisdom and common sense, coupled with his sense of humour. We raised our glasses to him last week and I am sure that we will continue to keep his memory alive.

- Roland Bailey, Brian Bainbridge, Bill Bradbeer, Alan Brafield, Michael Black,  
Frank Cox

It is with heavy heart that I heard of Vivian's death. He was a great scientist, but, more importantly, a great person with a wonderful, sharp sense of humour and proportion, and a great promoter of science and progress. His letters were always to the point and amusing, and the conversation over a beer always enjoyable and enlightening. The shock and regret of this loss to science spread like wildfire through the internet. I wanted to let you know how much he was liked, appreciated, and admired.

- Jonathan Gressel

I feel deep sorrow at this loss of a man who I so very greatly admired. A few brief words about how I knew him: he contacted me around the year 2000 because he had read a piece I published about Agricultural Biotechnology. I responded with the information that he requested. Soon thereafter we were exchanging e-mails about how to discuss and to promote the science and benefits of Agricultural Biotechnology. We then met at several conferences, including in London at an AgBioChatter members-only gathering, at which Sheila and he kindly hosted a lovely dinner. Finally, he visited me at the University of Oklahoma as he was working on the archival project related to Agricultural Biotechnology.

Vivian was a wonderful person, scholar, and advocate for Agricultural Biotechnology. He provided so many calming insights to me during these almost two decades of knowing one another. I will greatly miss him. Every day I am filled with gratitude at the blessing of having met him and benefitted from his sagacious presence, words, and guidance. His memory will be honoured by many for years and years to come.

- Drew Kersten

It was always with pleasure and a smile that I thought of Vivian. We are worse off for the lack of him, with his intelligence and interest in people, accompanied by an ever-present sense of humour. He will leave a big black hole in my life, when I finally acknowledge that he is no longer in London. I am so sorry we lost him.

- Nina Mozes



I really feel incredibly lucky that I got to see Vivian several times in 2017. Once in East Hampton (when he embarked on his determinedly focused summer tour of the US), twice in London, and, most recently, just weeks before he died when Rebecca and I came by for coffee at the house.

Even over the many years that I didn't see him nearly so often, Vivian has always reigned as a kind of familial fact of life. Someone we could count on for his drip-dry sense of humor and mischievous intelligence. And, of course, he was one of those rare individuals in my life who could connect me very immediately, and with great warmth and comfort, to my own father, whom I lost (incredibly) more than a quarter of a century back.

I will not forget Vivian. He was a larger-than-life presence, and his simply being really meant a lot to us over here in the States, most particularly to my mom, who I can tell you truly loved and admired him. In fact, Vivian was one of the few people with whom my mom always felt totally at home. He will be missed. By all of us. A lot.

- Alan Mozes

I joined Queen Mary some years after Viv had left, and so we did not overlap as colleagues, but I got to know him when he visited and then better through our joint interest in the GMO debates in 2000. We went together on a trip to the USA along with others to DC and to St Louis and he subsequently invited me to join the CropGen panel. I was very fond of Viv and so enjoyed my conversations with him; he was a very clear and lucid thinker.

- Conrad Lichtenstein

The 'young professor' was a friend, colleague, and, at times, a mentor to me as I moved from a research background into communications. Excellent company with a beer in his hand, we did not always agree about the way forward but that was the whole point – proper friends and colleagues do not just agree with everything said; you debate it, you look at the pros and cons of the situation, and then come to a conclusion and course of action. This was something that he excelled at, never taking offence if his view failed to sway a decision as long as he felt that his views had been taken into account. He will be sorely missed by the industry, and, for those of us who counted him as a friend, 2018 started off very strangely.

- Julian Little

I am writing to say how saddened I am by Vivian's death. I will miss his wry humour, insights, truth-telling, and courage. He and I belonged to a handful of scientists who were publicly supporting Ag Biotech in the earliest days. His work on CropGen was so important – and brave. Aligning yourself with a "pro-industry" position, even though it was also "pro-science" – was as difficult then as it is today. Having your scientific research challenged is one thing but being accused repeatedly of being an evil human being is different all together. It's

emotionally, psychologically, and spiritually exhausting. In the mid-early 2000s he united a group of about 15 scientists, scattered across the EU and North America, who were speaking the truth about Ag Biotech. Its stated mission was “information-sharing”, but, for me, its most important contribution was the emotional support it provided to each of us – beat up and battered and isolated in our respective corners of the world. By that time, after 15 years of fighting the good fight, I was ready to surrender. His initiative provided me with new energy – a second breath – that comes from knowing you’re not alone. Since that time the group, “AgBioChatter”, has grown to hundreds and become even more geographically diverse.

- Adrienne Massey

I am one of the Yiddish “mature” students and had the privilege of knowing Vivian over the years he attended classes. A nicer man one could not find; a brilliant sense of humour, kind and considerate, and still able to relate to all ages. He was a “mensch” and I, who only knew during term-time at UCL, will miss him enormously. I know he didn't “do” religion, but he had a great love of Yiddishkeit and I'm sure he would not object if I offer you the traditional wish that you, the family, have a long and peaceful life and that the Almighty comfort you among the other mourners of Zion and Jerusalem. They don't make 'em like that anymore! May he rest in peace.

- Harry Nash

I'll start by saying that I never had the honour of meeting Dr Moses in person. I am a relatively young professor and came late into his field of interest. I only “met” him recently through his past work.

Dr Moses was interested, among other topics, on the ways in which cells make energy. He studied a group of proteins, or enzymes, called glycolytic proteins, which are very important for making cellular energy. Before science had the tools to “see” how these enzymes were organized inside cells, Dr Moses and colleagues proposed that these enzymes were not just “everywhere” in the cell. Instead, they imagined (and had data to support) that the enzymes were coming together inside cells, working as a collaborative assembly line, rather than a dispersed one, to make energy (and other products called metabolites). They proposed these ideas decades before science had the tools to “see them”.

Recently one of my graduate students, Dr Sori Jang, a Korean woman born around the time Dr Moses retired, made observations in living cells that strongly support the ideas Dr Moses proposed over 40 years ago, namely the existence of subcellular compartments into which energy-producing proteins localize.

As you celebrate the life of Dr Moses, please know that his ideas and discoveries very much live on. Last year, I gave talks on our observations in over a dozen academic institutions and centres in three continents, and in the talks I have a quote from Dr Moses on this concept he and his colleagues proposed, (termed "glycolytic metabolon"). So his voice, so to speak, has been very much present in many of my research presentations.

Many of Dr Moses ideas were proposed by him in the '70s and the '80s, some before I was born, many when I was still a child in Puerto Rico (and before most of the scientists working in my lab were born in India, China, Korea, Jamaica, US, Canada, Spain, Germany, etc). Yet they have influenced, and will continue to influence, the thoughts of a young generation of scientists hailing from all corners of the world, all sharing the interests Dr Moses cultivated for decades.

One of the beautiful aspects of science is that it sometimes allows our ideas to transcend our physical and temporal restrains. Please know that today I share, from a distance, both sympathies and admiration for Dr Moses' contributions to science, and also celebrate, with you and his loved ones, his life and contributions.

- Daniel Colón-Ramos





One of the great pleasures of my adult life was to develop a genuine and grown-up friendship with my grandpa, with whom (as well as with my grandma) I lived at points during university holidays and then for a nine month period after graduating.

We share a great many interests, from politics and arguing the toss, to science (albeit his interest in this was far more developed than mine) and a desire to travel as far and wide as possible. I have every intention of matching his total of states of the USA visited, although besting it may prove challenging (he managed to get to all of them). We both love plain and fast foods, and macaroni cheese in particular, although admittedly he preferred his out of a box. Above all, we both always have to be right.

I am often delighted to discover, as I grow up, ways in which I am becoming similar to him. I enjoy meticulous planning, and am even beginning to keep track of my finances in a way of which I think he would be proud. While I hope never to stray quite as far into the realm of measuring and recording every little thing as he did, my partner is already concerned by the early warning signs.

One of the key traits I associate with him was his love of analysing everything. He did this dispassionately, but often with a smile and a flicker in his eye that betrayed his sense of humour, and the fact that he didn't take himself – or



anyone else for that matter – too seriously. He was, of course, a great believer in the power of genetics. I think he would be pleased by the extent to which this trait, and many of his other trademark attributes, manifest themselves so strongly in my mother, my uncle, and me. A large part of him is alive and flourishing.

It's not all good news, though; I have also inherited his inability to cook and intense fear of "creepy crawlies".

- Rupert Cunningham



*Thank you to all those who contributed to this booklet.*

*If you would like copies of the entries or photos emailed to you, or to be put in touch with any of the contributors, please contact Sue Cunningham at [sue.cunningham@ymail.com](mailto:sue.cunningham@ymail.com).*





