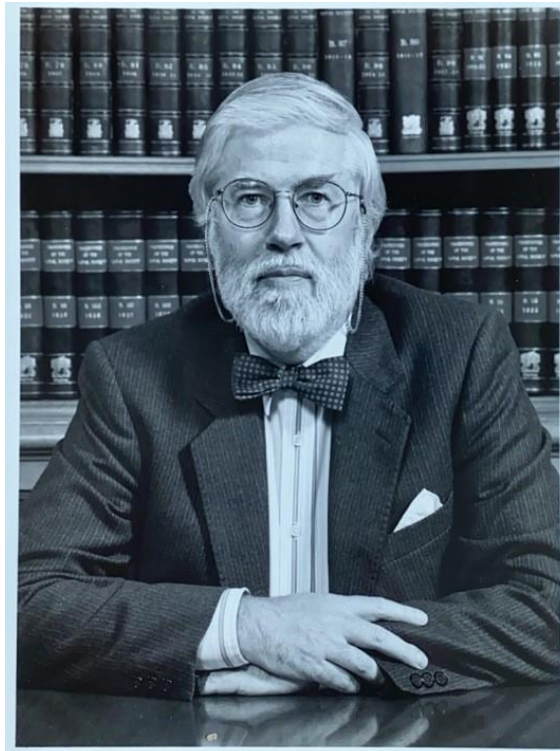


A ceremony of remembrance for
Thomas Cavalier-Smith

21st October 1942 – 19th March 2021



Glynn Valley Crematorium

Turfdown Road, Bodmin, Cornwall PL30 4AP

Wednesday 7th April 2021 at 3.30 pm

Celebrant: Melanie Richardson



Music: Arvo Pärt: Spiegel im Spiegel by Sophie Harris

Good afternoon and a warm welcome to you all, both here in the beautiful chapel at Glynn Valley and also to those joining us online. We have come together today to remember Thomas Cavalier-Smith, to honour his memory and to say goodbye.

Tom died in Derriford Hospital, Devon, on 19th March aged 78 and however long and rewarding his life was, this is a time of great sadness for all those who knew and loved him, as well as a profound loss to the international scientific community.

Ema has arranged this ceremony to honour Tom, with the readings and music selected reflecting not only her great love for him, but also acknowledging the wider affection and respect he inspired amongst so many.

My name is Melanie Richardson, I am a celebrant accredited by Humanists UK and it is my privilege to lead this ceremony today, one that very much reflects Tom's own outlook. Tom himself was a lifelong humanist – a philosophical stance that tries to make sense of the world through logic, reason and evidence – and Tom was a humanist in the very broadest sense, with an awareness and a deep sense of responsibility to the planet - and the variety of life it sustains.

When I first spoke to Ema – a brief telephone conversation to introduce myself – she very modestly suggested I Google Tom's name. The results lit-up my computer screen like a Christmas tree – firstly his own Wikipedia page, followed by a second Wikipedia page dedicated to the system of classification that bears his name. Next was a biography from The Royal Society and it was at this point I began to comprehend the eminence of my subject.

I cannot pretend to understand the subtleties or grasp the extent of Tom's work, but having read just some of the biographical and scientific information linked to him, it seems wholly appropriate that today we not only mourn the passing of this remarkable man, but also celebrate his life – a life that has contributed so much to our understanding of the world around us.

Stardust by Lawrence M Krauss

Read by Jane Worsley

Every atom in your body came from a star that exploded. And, the atoms in your left hand probably came from a different star than your right hand. It really is the most poetic thing I know about physics: You are all stardust. You wouldn't be here if stars hadn't exploded, because the elements – the carbon, nitrogen, oxygen, iron, all the things that matter for evolution – weren't created at the beginning of time. They were created in the nuclear furnaces of stars. So, forget Jesus. The stars died so that you could be here today.

Eulogy

By Neal Cavalier-Smith

"A giant has gone"

... so said more than one of the tributes which have poured in since Dad left us.

My favourite, perhaps:

"He challenged accepted wisdom, his wisdom became accepted."

He's variously described as *"a legend"*, *"a towering intellect"*, *"a walking encyclopaedia of life"*, *"charismatic"*, *"controversial"*, *"fearless"*, *"infuriating"*, *"one of the greatest minds in the field"*, *"one of few senior academics who made time to talk to me"* and even *"a living dinosaur"* - which he'd have challenged – for he was nothing if not precise. But he did like to remind us – we are all distantly related – and literally nobody on earth knew that better than him.

Staying with dinosaurs a moment, I'll never forget his delight, on receiving the Linnaean medal in the shadow of a dinosaur skeleton at Oxford Natural History museum; the Museum Director led him to a cabinet titled *"Origins of life"*, where his work was on display. So not only a legend, but also a museum exhibit in his own lifetime.

“A huge loss for biology” is also a huge loss for his other family – for his legacy spans two distinct families - his biological family and his Biology family.

Biologically he was *father* to me, my elder sister Jane, my younger sister Rose, and grandfather to Jane & Martin’s twins Ben and Chris. He was also a beloved husband, scientific collaborator and “*whole world*” to his wife Ema, who has cared for him *and* for his work, for decades.

His other family was his scientific family – in an eminent career spanning 55 years and countless publications, honours and awards - it seems he became a kind of father to the discipline of evolutionary biology.

Biology was his first love from the moment his mother Mary introduced him to it aged nine. Ahead of her-time as breadwinner for the family, she was a devout Christian who lived a life of Service as a Physiotherapist, whereas Dad was a devout rationalist and humanist who lived a life of Service to Science.

Though you could also see his father Alan in him, for Grandad was a very eccentric, rather Victorian dreamer, poet and play write, who founded a commune in the mountains above Nice.

So, what of Dad’s legacy?

To his Biology family he leaves a set of hypotheses about evolution that bring together the physical, structural, genetic, cell biology into one overarching theory – basically a unifying theory of evolution for generations of scientists to build on.

He had original ideas published in too many areas to list; but suffice to say they included the origin of life, the origin of cells, the origin of bacteria and the evolution of viruses. The answer to *these* questions is the foundation for urgent real-life issues such as how bacteria develop resistance to antibiotics or most pressingly in this COVID 19 era, how do viruses mutate?

For his specialism was no smaller question than ‘*The Origin of Life Itself*’ - the *fundamental* question – the original structure of how organic molecules organised themselves so as to emerge from the primordial soup.

And what happened next?

His ‘*system of classification of all organisms*’ re-drew the Tree of Life, the ultimate organisation of biological diversity, begun by Carl Linnaeus in the 18th century, and turned into an evolutionary theory by Charles Darwin in the 19th. Dad’s work arguably re-drew the tree to a greater extent than any other scientist in the 20th century, including defining a whole new branch, The Kingdom ‘*Chromista*’, and discovering the single common ancestor to all life on earth.

He was known for the depth as well as the breadth of his knowledge and never afraid to grapple with the details. As well as the new *branch* of the tree of life, he added many other organisms and major new groups, if you like, the twigs and the leaves of the tree. He was proud to have described more Taxa than anyone since Linnaeus.

Many were the scientists who were inspired or provoked by him. His theories were cited by fellow researchers no fewer than 18,866 times in his lifetime. And due to his fearlessness in evolving them as new data emerged, many were those scrambling to publish their work before “*Cavalier-Smith moves the goalposts again*”.

A quote abbreviated from Wikipedia:

Prof. Cavalier-Smith has produced a large body of work which is well regarded. Still, he is controversial in a way which is difficult to describe [with] a tendency to make pronouncements where others would use declarative sentences, to use declarative sentences where others would express an opinion, and to express opinions where angels would fear to tread. [Cavalier-Smith] can sound arrogant, reactionary, and even perverse. On the other hand, he has a long history of being right, when everyone else was wrong.

After studying at Gonville and Caius College Cambridge, then two postdoctoral years at the Rockefeller in New York, his early career was at Kings London, in the very crucible of DNA research, where he was a pioneer in the use of electron microscopy and later gene sequencing.

He synthesised his observations with those of the fossil record, geochemistry, biochemistry and phylogenetics in unprecedented fashion – galvanizing and frustrating experts from each field.

From there he moved to UBC in Vancouver where he became a Fellow of the *Canadian Institute for Advanced Research*, and in 1989 recruited, and soon married Ema - characteristically unconcerned by the age difference or “*what people might think*”.

It was during this time his theories became widely accepted and he was made first a Fellow of the Royal Society of Canada and then FRS in the UK in 1998.

The Royal Society stands out among all the fellowships and medals, as at a ceremony in London we got to see Dad sign the book which every fellow in history has signed. As he leafed back, half the signatories seem to be measurements or laws; Newton, Faraday, Boyle – but it was Darwin that Dad was looking for. That meant a lot to him.

In 1996 Ema and Dad moved to South Africa on sabbatical before returning to take up a NERC Professorial Fellowship at Oxford where he finished his career - and was inordinately proud of Oxford for coming up with the Covid Vaccine.

So what was this legend like when away from the lab? Well you'll see he never really *was* away from the lab - it even came on '*holiday*' with us.

For Dad was an adventurer – with such a love of nature that a holiday was always an expedition of some sort – his first question in a new place: "*Where shall we set up the lab?*"

Microscopes and binoculars came everywhere, and the quest would often take him places he '*shouldn't*' have gone. He was as oblivious to the danger of crocodiles when collecting '*lovely*' leaf mould from African riverbanks as he was to the gasps of devotees at a Thai Temple where he leapt in with the Sacred Turtles to get a mud sample.

Jane reminds us of a childhood spent examining liverworts, or chasing Hoopoes in France, or camping in the snow in Eastbourne so we could hunt for red algae in the icy rockpools.

Rose and Ema have collected Rhino dung in the plains of Africa, escaped from a hostage situation leaving a research station during civil unrest in Equador and expeditioned on a boat in Siberia dredging Lake Baikal for free living freshwater protists. We've all gained from his sense of discovery and belief that "*You can do anything you set your mind to.*"

(For example he took a quick O'Level in Chinese when a Churchill Fellowship was to take him there, absorbed several Open University courses in maths when he realised he'd need it for DNA analysis, and in 2004 learned enough Japanese to properly thank the Emperor of Japan as he was awarded the International Prize for Biology).

My husband Clive loves to recount the time he gave us some sample-tubes to bring back flagellates from South America. "*What sort of water should I sample?*" asked Clive (a lawyer by trade) "*Well if you were a flagellate*", said Dad, "*where would you live?*"

Sure enough, in the botanical gardens of Buenos Aires we came across an algaed pond and turning to one another chorused "*If you were a flagellate, where would you live?*" One of those very flagellates came to be immortalised in a paper.

All his children were more familiar with the musty smell of a second-hand bookshop than any child should be, and all of us impressed by his proper-Nutty-Professor-filing-systems – Rose recalls a pile of papers so high it actually reached the ceiling, the power of biology obviously outweighing the laws of physics.

I learned to use a microscope before a football and remember the actual model of DNA you see in all the textbooks, sat gathering dust in the reception at his lab.

Ema found it amusing and sweet when Rose turned six and she went up to Dad at his desk and hinted “*It’s my birthday today Daddy*”– “*I shall make a **file** for you on my computer*” said Dad and he labelled it *Rose*, and she loved it like it was magic, and that folder is still on his laptop.

So we remember him as a very human sort of genius – with his head absolutely devoted to science and all-but-uncluttered by ordinary concerns. By no means a conventional father, but a source of inspiration, inquisition and encouragement, as well as an impetus towards precision and accuracy in all things.

Dad, thank you for being with us today – we all know you’d rather be *finishing one last paper...* but your life’s work is done now, and you are at peace.

The hundreds of trees you planted in your beloved acres in Cornwall will grow into a woodland where we’ll scatter your ashes.

And the seeds of knowledge you planted will grow evermore.

It is said by some, you only die when the last person speaks your name – by that measure Dad will outlive us all – though *he* believed the soul dies with the brain, and his legacy lives on only in the textbooks of the world and the careers of the people he nurtured, coached encouraged - and sometimes infuriated.

But he also lives on in our memories, and our hearts, and most of all, our DNA.

I understand from Neal that there was a lot of material he was forced to omit from the eulogy – purely due to time constraints - and having heard so much about Tom I can quite believe it. But for now we will listen to a piece of music to give us all a chance to reflect back on everything we have heard and it is also an opportunity to recall your own, personal memories of Tom. This is – *Pachelbel’s Canon and Gigue in D major* a piece of music that is particularly special to Ema and Tom.

**Music: Pachelbel: Canon and Gigue in D major arr. Max Seiffert by Berliner
Philharmoniker**

There has been an extraordinary response to Tom's passing, with expressions of sadness and e-mails, letters and cards brimming with memories from so many people that we had a challenge to include a fraction of these in the time allowed today.

A former undergraduate student from over thirty years ago describes Tom as the intellectual mentor and provocateur for an entire generation of researchers, whilst another describes him as *"A man that was revered for his knowledge, feared for his rigorous attention to detail, and stirred up a lot of emotion in everyone else."*

Challenging the agreed narrative held no fear for Tom, neither did he shy away from changing his mind about his own ideas, whatever the consequences. Another former student, now teaching, says this *"More than the theories, what I emphasize to my students was Tom's willingness to integrate new data, even when it contradicted some of his most famous ideas. That such an eminent scientist took this approach makes my students take pause."*

Equally, Tom didn't believe that colleagues should fall out over opposing views. A former colleague writes *"He taught me something else that was really important, which was how you can argue with your colleagues or disagree, and then just smile and say 'I guess time will tell!', and carry on being friendly. Tom was so good at that."*

But my favourite comes from friends in South Africa who recall happy memories of Tom in his bush hat, shorts and hiking boots with his binoculars round his neck. They said *"Tom and Ema would pop in to say hello to us as we were getting up, and we'd find that the two of them had been out walking since before sunrise. He would be so animated as he described the birds the two of them had spotted, and the animal tracks, and then he would start on an interesting story and he would chuckle so much as he retold it. Both an intellectual giant and a very humane human."*

Cicero wrote *“The life of the dead is placed in the memory of the living”* and you will all have your own unique recollections that will stay with you always. Tom has left a wealth of memories that will remain with you, as well as the legacy of his brilliant mind in his work that will be studied and debated for generations to come.

We have come to the part of the ceremony when we say our final goodbyes to Tom and let him go. Saying goodbye is always difficult and saying farewell for the final time is exceptionally hard. We are saying goodbye to Tom, but only his body. The essence of who he was is what you take with you into your hearts, where you keep a special place for those you have loved.

Hold onto Tom in your thoughts, remembering the times you have shared and be thankful for having known and loved him. Enjoy your memories of him, just as we have done today.

*To everything there is a season
And a time for every purpose on earth
Here, in this last act - in sorrow, but not in fear
In love and appreciation, we say our final goodbye.*

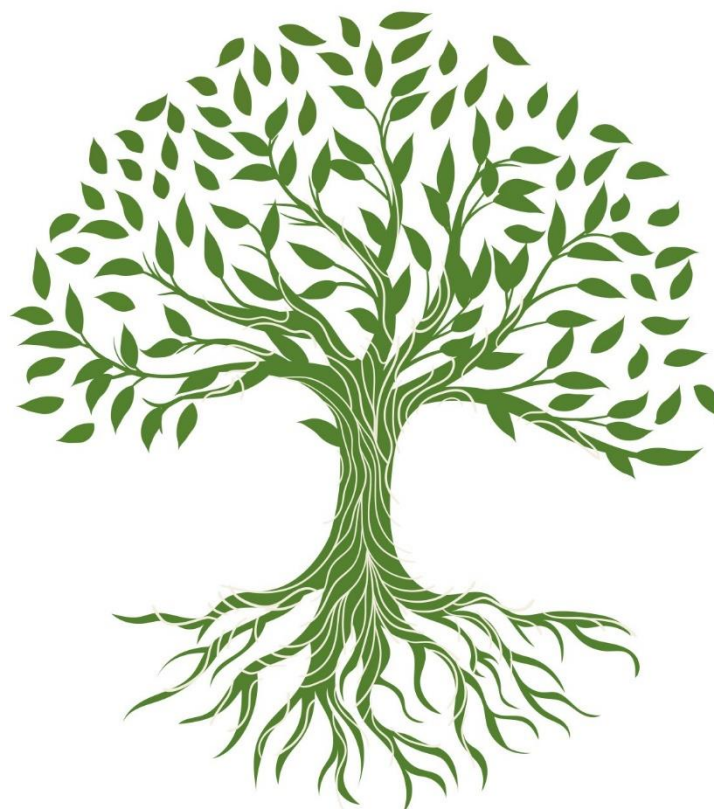
Thomas Cavalier-Smith, we feel privileged for having known and loved you. We grieve that you are no longer with us, but you live on in our hearts, minds and memories. We took delight in your love and your friendship, and the good times that we shared. We remember with gratitude all that you were. And now we leave you in peace. And with respect, and the greatest affection, we bid you farewell.

Our ceremony today is drawing to a close and I do hope you have drawn comfort from coming together today to honour Tom. It is a pity that these difficult times place such restrictions upon us, as there are many others who could not attend today who would have wished to do so, and I expect they are thinking of Tom and raising a glass or two to his memory later on.

Contributions in Tom's memory can be made via the funeral director, with all proceeds being donated to MIND, which provides advice and support to anyone experiencing a mental health problem and works to improve services, raise awareness and promote understanding.

As we leave today, we will hear another piece of music, this time chosen by Rose as a final tribute to Tom. This uplifting piece of music from Icelandic band Sigur Rós was used in the BBC series Planet Earth. The lyrics are mostly nonsensical, but the title *Hoppipolla* loosely translates as 'hopping into puddles' which is a joyous way to finish our ceremony today. Do please stay and listen to the music, the Funeral Director will guide you when it is time to leave.

But we will end today with the words of Arnold Crompton in his verse *Instructions*, words that Ema said she could hear Tom himself saying.



Instructions by Arnold Crompton

*When I have moved beyond you in the adventure of life,
Gather in some pleasant place and there remember me
With spoken words, old and new.
Let a tear if you will, but let a smile come quickly
For I have loved the laughter of life.
Do not linger too long with your solemnities.
Go eat and talk, and when you can;
Follow a woodland trail, climb a high mountain,
Walk along the wild seashore,
Chew the thoughts of some book
Which challenges your soul.
Use your hands some bright day
To make a thing of beauty
Or to lift someone's heavy load.
Though you mention not my name,
Though no thought of me crosses your mind,
I shall be with you,
For these have been the realities of my life for me.
And when you face some crisis with anguish.
When you walk alone with courage,
When you choose your path of right,
I shall be very close to you.
I have followed the valleys,
I have climbed the heights of life.*

Music: Hoppípolla by Sigur Rós

Rose Cavalier-Smith lights a candle on the front alter in memory of her father
