

# John Meurig Thomas

Born 1932.

Autobiographical life story.

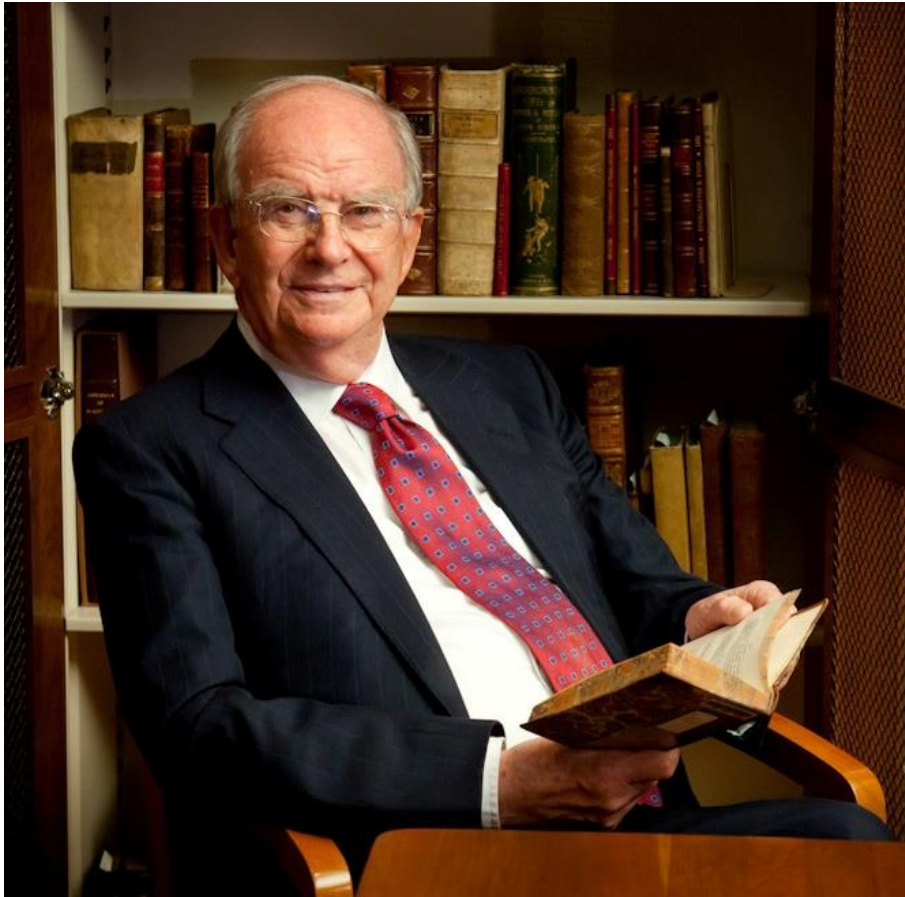
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*The text of this life story is transcribed, with thanks and acknowledgement, from the collection of Filmed Interviews with Leading Thinkers at the Museum of Archaeology and Anthropology at the University of Cambridge. The interview was carried out by Prof. Alan Macfarlane on 4th November 2009 and was transcribed by Sarah Harrison. It can be seen here: <https://www.sms.cam.ac.uk/media/1132783>*

# 1. Family Background



I was born in South Wales in a small mining village in 1932; maternal grandfather was a gardener in the Swansea valley and paternal grandfather was a farmer and engine driver in Carmarthen; father was a coal miner who worked his way up to being an overman which was the highest you could go without qualifications; he worked in an extremely lively village with lots of music and drama, also sport.



Battle of Gallipoli.

Father went to the First World War which influenced him profoundly; it was his university; he fought in Gallipoli, the Somme, North Africa etc. and was awarded the military medal for bravery in Gallipoli.

He taught me a great deal; he had great linguistic skills but hopeless mathematically; there were five children and I was the last but one; my one brother [twelve years older] was also a coal miner all his life; two older sisters and a younger one who died of infantile paralysis aged eight.

I was brought up the the Gwendraeth Valley where the coal mines run out and beyond which is the agricultural area; the setting of Dylan Thomas's 'Fern Hill'. An extract follows:

*Now as I was young and easy under the apple boughs  
About the lilting house and happy as the grass was green,  
The night above the dingle starry,  
Time let me hail and climb  
Golden in the heydays of his eyes,  
And honoured among wagons I was prince of the apple towns  
And once below a time I lordly had the trees and leaves  
Trail with daisies and barley  
Down the rivers of the windfall light.*

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## 2. Gwendraeth Grammar School



The Gwendraeth valley.

What was so nice about Gwendraeth Grammar School was that there was a mingling of the sons and daughters of farmers and miners; big contrast, the former were lugubrious and slow while the latter were much more alert; it was a rugby school with four Welsh international players from there.

Teaching was excellent; brilliantly taught by a physics mistress, Irene James, who told me about Michael Faraday; I kept in touch with her until her death; she had the gift of not just telling us what physics was about but adding biographical details of great scientists; Michael Faraday became my hero; one of my greatest joys was much later to occupy the Chair that was created for him and to do the job that he did at one time as Director of the Royal Institution; Irene James was sitting in the front row for my inaugural lecture there.

My mother left school aged twelve; she had none of my father's linguistic skills; throughout her life she spoke to me in Welsh; my father decided when I was ten that my English was so atrocious and was petrified that I might not pass 11+ that from then on he spoke to me only in English and expected me to answer in the same; mother one of nine children; she was shrewd and had a phenomenal memory which I think I have inherited. I have found that some of the best scientist have amazing memories eg. Linus Pauling.

I was also Welsh walking race champion and played cricket for the University of Wales; a reluctant rugby player but played first class cricket for South Wales and Monmouthshire until I became a professor. Chapels in South Wales marvellous places for choral music [and for outstanding preachers]; at about six heard the choir sing 'The Creation'.

At an early age took a great interest in bird watching encouraged by my father; also collected birds eggs but very responsibly, only taking one egg when there were five

or six; Welsh words for birds; also read Mee's "Children's Encyclopedia" where I pondered on a writer, Dorothy Crowfoot, who turned out to be Dorothy Crowfoot Hodgkin the Nobel Prize winner. I got to know her very well and told her how she had influenced me as a child.

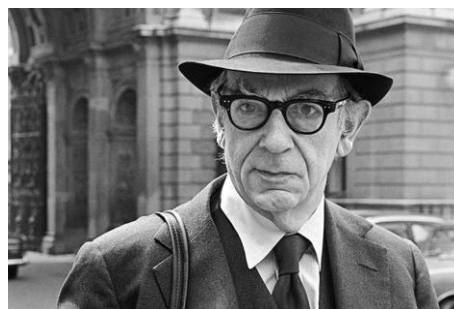
J.B.S. Haldane also influenced me; he was an ardent Communist and wrote articles in the 'Daily Worker'; in the barber's shop where I grew up the local Communist, one of several passionate, well-informed individuals, would deliver the 'Daily Worker' free of charge every morning to the three barber's shops; there I read Haldane's scientific articles; one, on being the right size, another on the atmosphere of planets; he induced my interest in science a great deal.



Up until school certificate in 1949 I did not really know what I wanted to do; R.A. Butler's Education Act of 1944 meant that I could go to school free; when I started Grammar School my father had to pay; at 'A' level I enjoyed myself; had done quite well in geography, English literature, physics and mathematics and I wanted to do physics, mathematics and geography; the headmaster decreed that the timetable would not allow that so told to take chemistry. I was the only pupil in that class, during the first hour would talk about rugby and the second would do chemistry; read an extremely important book by Eric James, later Lord Rushholme, then chemistry master at Winchester, 'Problems in Physical Chemistry'. I found the academic life of the sixth form exhilarating.

### 3. Swansea University & Queen Mary College

I went to Swansea University where I was also extremely well taught by people appointed by John S. Fulton, later Vice-Chancellor of the University of Sussex, who really understood what universities were about; he was really inspiring; first year students had to write essays on broad subjects fortnightly, and then, four at a time, read them to him and have an hour's conversation; impressive that he took the time to do this; also every Tuesday afternoon each first year student had to go into the largest lecture theatre to hear such persons as Isaiah Berlin (above) speak. So in a small provincial college I had a first class education



Chemistry is a pretty central subject as it sits within natural sciences so that you can look at the biological world, the medical world, the physical world and earth science; I am a physical chemist by description but I do my work these days in an area called catalysis; in a literal sense there is something magical about a catalyst which has the ability to accelerate the combination of two or more reagents and give you a product; not only that but there is a knack associated with designing a catalyst such that it gives you a particular product; my job is to design a solid, a crystal usually, where I have "placed" a group of atoms which, when they are exposed to an incoming reactant they convert it to a desirable product; nylon at present is produced in a very environmentally harmful way, from oil and benzene, then concentrated nitric acid, sulphuric acid etc.; for every kilogram of nylon you produce four kilograms of waste.

With a post-doctoral worker I produced a "green" synthesis of nylon, published in Proceedings of the National Academy of Sciences (US); this does not mean that the manufacture has been changed as I was doing this as an intellectual exercise and a proof of the value of laboratory chemistry; dislike of patents although I have taken some out; I have often been supported in my work by big companies; the Bayer company saw my work in Cambridge and were extremely interested; I sent my post-doctoral worker over to Germany where they have excellent facilities; German chemistry is the best in the world and the big German companies have been dominant; Bayer liked what we were doing and filed patents in our name.

Most of my work has been sponsored by the Science Research Council or Engineering and Physical Science Research Council or by the University, but from time to time because of the nature of my work as it is immediately applicable in industry, I have got grants from companies towards research but refuse to sell out to multinationals; fear big companies linking themselves to prestigious universities such as Cambridge and trading on the connection; the duty of the university is primarily to pursue knowledge and exploit it.

Of course, you have to be realistic as big companies pay taxes that sustain our universities; rules are much clearer in America; embedded research institutes like those funded by Microsoft and BP in Cambridge have access to all seminars within the university but the university does not have access to all of theirs; I am disturbed by this; experience of one of my old students who found himself lecturing to just such a mission-oriented multinational group when he had expected to be giving an open lecture.

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## 4. AEA and Bangor University

After finishing my PhD which I did in Queen Mary College, London, as my supervisor, Keble Sykes, went there; I then stupidly joined the Atomic Energy Authority and worked in the atomic weapons research establishment; I need not have gone into a reserved occupation as all those who had graduated with first class honours were excused.

I was somehow struck by the idea that the equipment side at Aldermaston was so good that I would enjoy myself there; even after a few weeks I realized that this was the wrong place to be; I am ambivalent at best about atomic weapons and didn't want to be there.



Bangor University.

I got an assistant lectureship at Bangor; delightful to immerse myself in North Wales culture; my Welsh improved enormously; signed up for the extra-mural courses and lectured at evening venues. For two years running I gave a twenty-five lecture course on the history and evolution of science; enjoyed lecturing to school children in both English and Welsh; was allowed freedom of research; at one stage Bangor had five fellows of the Royal Society which was pretty good for a provincial university.

I left when a new professor came and it was obvious that he wanted to starve me of research students and even stop me doing research; he wanted these students for his own research; by that stage I was a Reader, which I had become aged thirty-two, and had done some good work, winning the Corday-Morgan prize for the best chemical research for a person under the age of thirty-six; also an award from American Carbon Society.



## 5. Aberystwyth University



Aberystwyth.

I got the Chair at Aberystwyth which was an exhilarating period of my life. It was a well-organised department with a Principal and Registrar who were very able; also able to attract people from Cambridge, Oxford, India, Japan, Russia - I built up a department of solid state chemistry which was probably the best in the world.

I was invited to take professorships at Birmingham, Manchester, Liverpool, Edinburgh and London, but wasn't interested because I was so happy there; my children spoke Welsh, bird watching was wonderful, my wife was doing a higher degree in comparative religion.

I was intending to stay there for the rest of my life but then I heard that Cambridge was going to offer me a professorship; agonised over it fearing I might drown in Cambridge, so full of extraordinary people; would my children be happy as my younger daughter, aged six at that time, spoke no English; we came, and it was one of the best things I ever did.

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## 6. Cambridge University



King's College Cambridge.

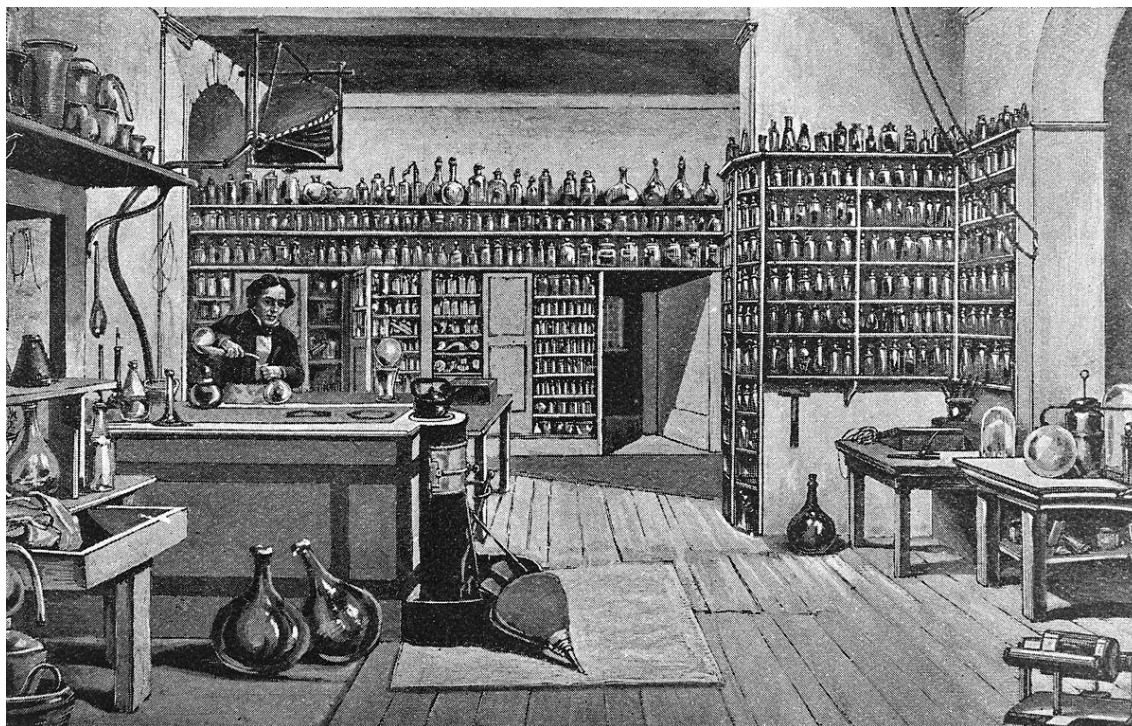
I came to King's in 1978; loved the elderly people who sat in the Combination Room before dinner: Meyer Fortes, Clifford Derby, Kendall Dixon, Braithwaite, Christopher Morris, Patrick Wilkinson, Michael Jaffe - all befriended me; Dan Brown persuaded me to come as I knew very little about Cambridge; I had lectured in the metallurgy department in March 1974.

I walked up from the Backs towards King's and couldn't believe how beautiful the place was; I could have gone to three or four other colleges but Mansell Davies at Aberystwyth stressed the quality of the music at King's. The Provost, Edmund Leach, was a strange man. I met him first with Dan Brown and Martin Rees; Hal Dixon and wife's Christmas parties; Charlie Loke; Tom White; Bernhard Williams; Sidney Brenner; Gabriel Horn and I were admitted the same night; Patrick Bateson; thought at first some of the younger fellows who were very left-wing were what I would describe as cocktail party socialists. I had been brought up with true socialists. I found that mingling with people in other subjects was valuable. There was wonderful music in chapel where Philip Ledger was then in charge followed by Stephen Cleobury who is a friend to this day; David Willcocks

My immediate predecessor as Professor was Jack Linnett; a wonderful human being who became Master of Sydney Sussex and then Vice-Chancellor; he was immersed in administration as a consequence. The Department of Physical Chemistry was not as efficiently run as other chemistry departments; I found some of the technicians were growing tomatoes as no one was checking on what they were doing.

The real impact was to find how bright the Cambridge students are where nine out of ten were capable of becoming PhD students. Giving supervisions was some of the most exhilarating teaching I have ever done; students amazingly able and could

tackle problems that even I was unsure about. I wish in some ways I had come when younger and then I would have done even more; memories of Lawrence Bragg; purpose of the Royal Institution; Bragg was the youngest Nobel Prize winner at twenty-five, a crystallographer; also had the ability to describe science in simple terms; his father, W.H. Bragg, was also a great communicator and Dorothy Hodgkin apparently became a scientist having heard him give the Christmas lectures at the Royal Institution. I have given these lectures myself. Faraday has been my lode star, I have lived in his home, and have read most of his letters, articles and journals.

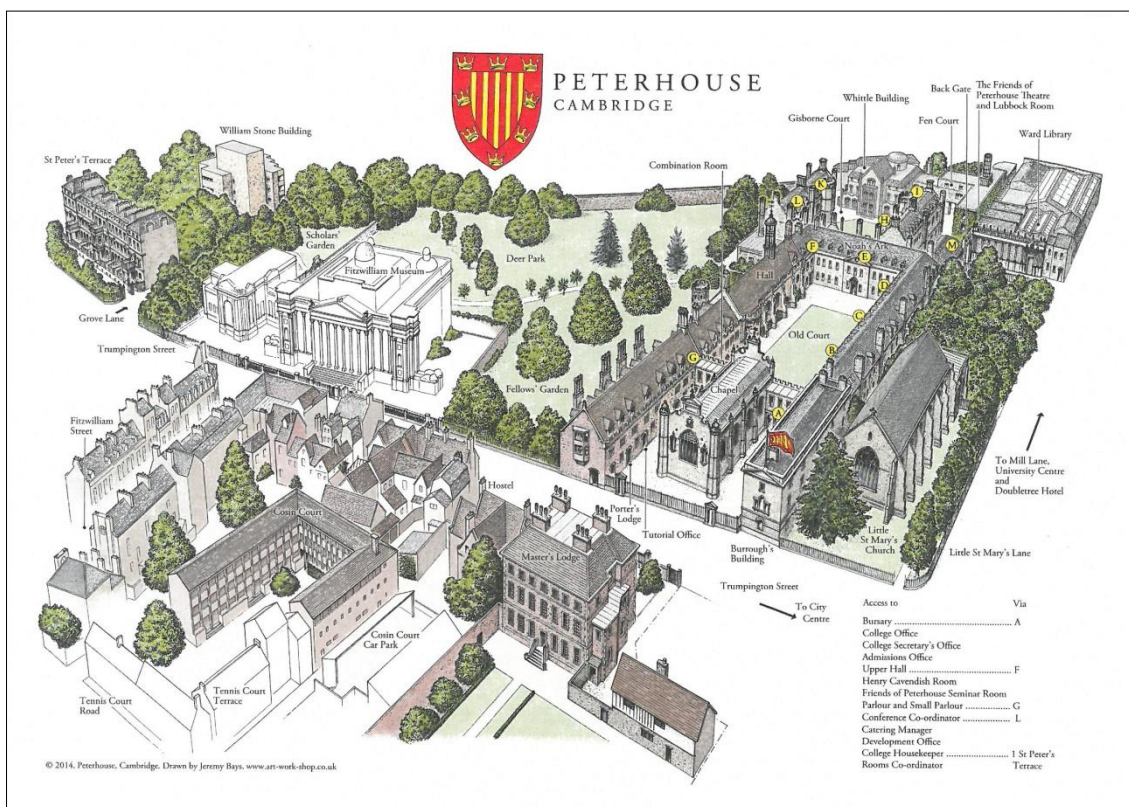


Faraday in his laboratory at the Royal Institution.

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## 7. Master of Peterhouse

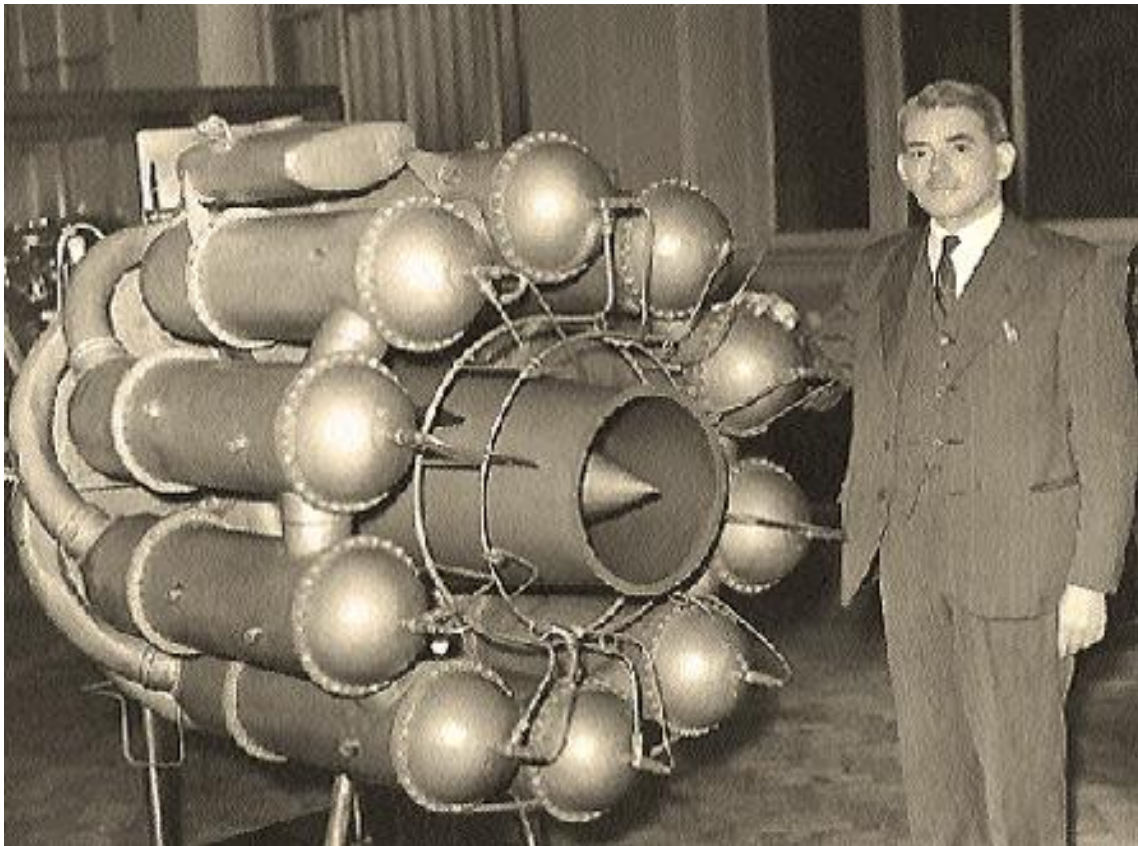


Peterhouse, founded in 1284, is the oldest College of Cambridge University.

I had to resign my fellowship at King's when I went to the Royal Institution (in 1986). I would have stayed there but my wife became ill and I was advised that the strain of entertaining was not good for her; I had a short period as Deputy Pro-Chancellor of the University of Wales, a part-time job, while still researching in the Royal Institution; in 1993 came back to Cambridge as Master of Peterhouse.

I really enjoyed it although it is a right-wing college and I am left of centre; found even the right-wing fellows were nice people; a small college is even better than a big one at getting people to interact; physicist Peter Scheuer; Aaron Klug; Hugh Trevor-Roper; one great thing about being Master is that you can help people; critical role of Senior Tutor in a college; most important job for a Master is to choose fellows, especially research fellows, which I took extremely seriously.

Peterhouse had the reputation of being a history college but the number of active historians was few; both Mack Smith and Tony Wrigley had gone. However there were four Nobel prizewinners in chemistry on the staff - Max Perutz, Aaron Klug, John Kendrew and Archer Martin; also Frank Whittle inventor of the jet engine and Christopher Cockerell inventor of the hovercraft etc. Ted Kenney, great expert on Ovid; universities as moral places; joy of being able to help people as Master; one criteria of a successful Master is how well your students perform. Two people are important in this respect, the Admissions Tutor and the Senior Tutor. The joy of sitting with people and enquiring about their work, such as Brendon Simms, historian.



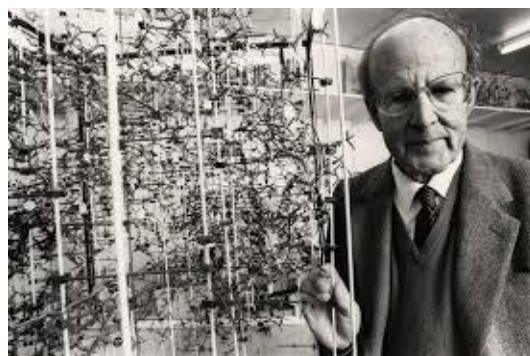
Sir Frank Whittle, inventor of the jet engine.

Being Master of a larger college like Trinity would be a much more difficult job; in a small college you could get to know everyone; I knew all the students by name as my wife and I had lunch once a week with them; only seventy seven first year students.

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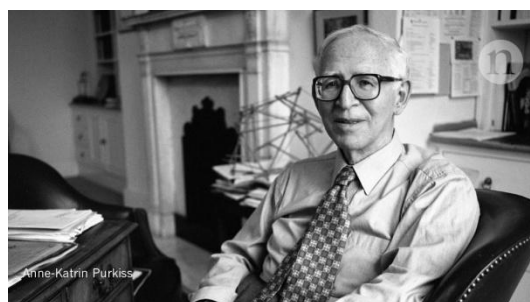
## 8. People

I knew Max Perutz for thirty years; a cultured Viennese Jew; he was phenomenally able and a hard worker with extraordinary intellectual energy; widely read and loved writing book reviews. His rules about running a laboratory and getting to know and involve the technicians; giving credit for work done by junior researchers. Francis Crick joined him aged about thirty four.



Perutz showed him a paper written by himself and Lawrence Bragg which was going for publication; came back full of red marks and Perutz said that elsewhere in the world a student would never say such things, but this is the British system; reason why he loved British candour. He gave an eightieth birthday celebration where Hermann Bondi was a guest; had both been sent to Canada during the war as thought by Churchill to be dangerous. His laboratory generated fourteen Nobel Prize winners which he explained by it being an open society

Aaron Klug, by training a chemist, switched to physics and then to biology; he quantified electron microscopy in such a way that it enabled future generations of biologists etc. to solve the structure of viruses and membranes of a living cell; impossible to do before him; Roger Kornberg, Nobel Prize winner in 2006, and Jean Thomas worked under his



tutelage; zinc fingers; he was the tutor in natural sciences at Peterhouse at the time he was winning his Nobel Prize; his predecessor, John Kendrew, did exactly the same; they were not University staff but college staff; John Kendrew also taught the history of science, physics and chemistry, while doing his Nobel Prize work on myoglobin; that is the genius of Cambridge. People pursue excellence in Cambridge; music in King's one example; fiercely able people like Martin Rees, teaming with ideas, restless for more knowledge and very good at communicating it; great thing about students in Cambridge is that they are the beneficiarys of three things: very good lectures (on the whole), they themselves have been carefully chosen, the supervision system. My own experience of other universities shows there is not this conjunction of qualities, except in Oxford. This is why we are in the first league of universities in the world. It was set in train decades ago, whatever the Government did or the governance of the University; in moments of gloom think it is ungovernable as it is so complicated. My own experience of being brought up among people who worked manually; and to be given the freedom to be in libraries, laboratories, to mingle with people of a similar disposition with a thirst for knowledge, what a pleasure.



## 9. Thinking and Walking

I have always had a deep religious sympathy; my wife was a Biblical scholar; I owe a great deal to the Biblical belt in Wales. I am not a convinced Christian and the older I get the more mysterious and mystifying I find life to be; I would like to believe though I can't; I think of the incredible contributions that religion has made and am not in the same camp as Richard Dawkins etc.; much more in the camp of John Polkinghorne and Tony Hewish. I did not have any discomfort with my role in Chapel. I find the 'big bang' theory unsatisfactory.

I walk about three miles every day, partly to keep physically fit but partly for mental stocktaking; in Wales I used to walk up the hills and even go into a field of sheep and lecture them; start work as soon as I get up and work all day apart from my walk.

My advice to students would be not to waste time, every day is precious, learn some new facts every day and understand the theoretical interpretation of those facts; read, read, read, and write, write, write; one of the best pieces of advice I was given was by the Principal of Swansea, John Fulton, was if you didn't understand something, write down what you did understand and did not; you usually do not write nonsense to yourself; I used to rewrite every lecture note that I took and became a better chemist as a result; believe that I understand things better by trying to articulate them

For a long time industrial chemistry has been rather profligate in the way that it has used resources of nature and reagents which are harmful to the environment; this needn't have been so but because there was no legislation, and because they were cheaper and more convenient, people used materials that we now realize should never have been used.

You can as a clever chemist design catalysts that can use oxidants like air or oxygen; my last ten to fifteen years have been a pursuit for green chemistry; I have been assembling catalysts in a solid form such that they can oxidise in a gentle way a material using air or oxygen; a benign thing to do. I have always been interested in developing new experimental techniques; proud of the fact that in the mid-sixties I realized that the electron microscope was a vitally important tool for the chemist. When I got to Aberystwyth I had three and there wasn't another department in the world that had them. Now there is not a department of chemistry that does not. Some prizes I have won have come because of work on the chemical side of microscopy. I used synchrotron radiation in chemistry at the Royal Institution; it enabled one to take pictures of a molecule or even atoms in a picoseconds.

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