

Mr Chancellor,

Just behind St Pancras Station in London stand two cranes that mark the site of the new Francis Crick Institute, an innovative venture pulling together the resources of a half dozen leading organisations into what has been described as “the mother-ship of British bioscience”. This collaborative enterprise is a result of the inspiration of Professor Sir Paul Nurse, to whom we are to award an honorary degree this afternoon. President of the Royal Society, former president of The Rockefeller University in New York, knight and Nobel prize winner, not to mention the recipient of myriad other international awards, he has done well for a lad from London who just could not pass French O’level.

To understand how he got there you first have to realise that Paul Nurse is a man who is interested in everything, possibly excluding French linguistics. Intelligent and interested observations of the natural world are the bedrock of great biological discovery, helping to crystallize theoretical questions and experimental approaches to resolving them. As a child, Paul was an astute observer of the natural world, from the creatures at his feet to the heavens above, a trait shared by many great biologists; like Darwin himself, he even had a beetle collection. So, when it comes to scientific observation, Paul Nurse started early.

But his career nearly stopped before it started. A modern language O’level was considered essential to secure a place at University but, despite a half dozen attempts, the brain of the young Paul was so full of fascinating science that declining the past perfect of the verb *decouvrir* (to discover) was really

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not as interesting as actually doing some discovering. So, he took a job as a laboratory technician in a brewery and was almost lost to British science in a vat of Guinness. However, his latent talent was fortunately spotted by Birmingham University, a few rules were bent and he had a place.

With his degree in the bag it was time to do a PhD and he moved to University of East Anglia where he could pursue a project on molecular changes in the cell cycle. Like any PhD student he went through the lows as well as the highs and at several points again considered a career move, but stuck at it. With the PhD completed it was time to move on and find the sort of environment where he could grow into an independent scientist. He moved north to the fine city of Edinburgh. This time in Edinburgh, with a spell in Switzerland, was pivotal. It was a little chilly in the winter for a soft southerner, but marked the crucial development of his work on the genetics of the cell cycle in yeast.

Latitude and the earth's tilt played a part in Paul Nurse's next move. As a keen astronomer (another continuing interest alongside the thrill seeking of being a glider pilot) Paul knows that the earth is tilted on its rotational axis at about 23 degrees to the perpendicular in relation to the sun. The winter days at 55.5 degrees north are, therefore, disproportionately short (and cool). The southern softy tendencies kicked in and the long dark nights eventually got to him and he moved 5 degrees south to the searing heat of Brighton and then back to work to a lab at the Imperial Cancer Research Fund (aka ICRF) in London.

Now, you may be wondering what someone working on yeast cell cycles, which sounds pretty esoteric, was doing working for a cancer charity. Esoteric it may sound, but Paul Nurse had a hunch that yeast cell replication

may not be particularly unique. He saw yeast cell cycles as a model for the genetic control of cell replication generally, a potentially elegant and attractive model for this most basic process. He clearly has an eye for an elegant and attractive model..... because a major breakthrough occurred at that point. One of his post-doctoral students used a mutant yeast *cdc2* gene (the control gene on which he had been working) to clone the equivalent human gene – in other words the same mechanism was present in yeast and in people. So let's think this one through. Here is a piece of genetic code, so fundamental to life itself that through billions of years of evolution it is preserved in organisms as diverse as yeast and humans. What was more, at a sweep it took us to a new place for people, to a new level of understanding of the control of human cell replication. Cancer is a disease of disordered cell replication, and **that** is what yeast cell cycles were doing in a cancer research lab.

In the late 1980s, he moved to Oxford to take up the Chair of Microbiology, learning the sorts of things you learn as head of a unit (endless fun with finances and HR) and then back to ICRF as Director of Research and then Director General, overseeing its merger with the Cancer Research Fund into the huge organisation that is now Cancer Research UK. He became president of Rockefeller University in New York in 2003. He still has active laboratories there and in the UK where the work to unpick the fundamentals of life continues. He was awarded a knighthood in 1999 and the Nobel Prize in Physiology or Medicine in 2001 alongside his London colleague Tim Hunt and Lee Hartwell from the US for their ground breaking work on the control of cell cycles. He is now President of the Royal Society and will be the first director of the new Institute at St Pancras.

I started by saying Paul Nurse was interested in everything and it seems, from the outside at least, that this broad understanding combined with a willingness to think through how different scientific disciplines approach a problem, has been pivotal. In the late eighteenth century, in the period of enlightenment, philosophers, scientists and artists mixed and shared views creating a fertile environment for ideas and, in turn, economic development. Paul has talked about now being the time for a new enlightenment in Britain. He took this broad enlightenment view so seriously that he even married a social scientist; his wife, Anne, has doubtless presented him with many an alternative way to view the world. This is also what the new Crick Institute is about, the concept of enlightenment and the economics of agglomeration. There is also a lesson in there for all of us, including the new graduates here today, about the value of an understanding of the world, or of medicine, that extends beyond your own professional boundaries.

Sir Paul Nurse has used his position and experience to take the voice of science to where it needs to be heard, and has proved himself to be an effective and vocal champion for all of the good science on which our world depends. Anybody who witnessed him systematically expose the underlying scientific ignorance surrounding climate change scepticism on the BBC Horizon series would have been heartened to see scientific method so clearly advocated in a public setting.

Mr Chancellor, as you know, our tag line at Newcastle is “research with a purpose”, we believe that what we do should have a benefit for our society. Paul Nurse has demonstrated not just the profound purpose of his own research and how it can be applied, but has also made it his job to remind all of us about the purpose of science and research overall and about its pivotal part in all of our lives. I think we can overlook the French O’level thing and

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I present him to you as a candidate for the degree of Doctor of Science honoris causa.

Citation by Professor Jimmy Steele, 10 July 2014