

A physics lesson for physicians

Richard Feynman was one of society's most brilliant physicists. However, his ability to analyse the politico-economic forces underlying scientific work made him unique. His words, captured in a 1990s *Horizon* documentary, are acutely relevant today to all NHS workers.

Introduction

I am not ashamed to admit that I spent all of a recent Sunday afternoon in bed, watching videos on the internet, because one of these videos was the outstanding 1993 *Horizon* documentary about the life of Richard Feynman, the Nobel Prize-winning theoretical physicist. He was somewhat of a maverick, whose disregard for political pressure and unending thirst for knowledge, coupled with humility and charm, made him one of the most celebrated physicists of the modern age.

At the end of the documentary I was in tears, not because it ended with Feynman's death from cancer or because of the emotional tributes from friends and family. It was because many of his comments crystallized my feelings about the NHS, particularly the issues raised by the Francis report.

The Challenger

After winning a Nobel Prize, Feynman became even more famous for his work on the investigation into the Challenger space shuttle disaster. He was initially reluctant to get involved, as he was deeply suspicious about the motives of Washington politicians. After much consideration, he had a talk with his wife Gwyneth who advised him:

'if you're on this thing... if there's something interesting, if there's something strange about it, or something like that, you'll find it and it wouldn't have been found otherwise' (*Horizon*, 1993).

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Feynman noted that most of the other commissioners on the investigating committee had conflicts of interest which jeopardized their impartiality and objectivity. He, both by circumstance and by nature, did not:

'I have a unique qualification: I am completely free and there are no levers that can be used to influence me. There are exceedingly powerful political forces and consequences involved here... I disregard them all, and proceed with apparent naive and single-minded requisite. To one end, first why, physically, did the shuttle fail; leaving 'til later the question of why humans made apparently bad decisions when they did' (*Horizon*, 1993).

The truth

Gwyneth Feynman's prophecy came true: her husband contributed largely to the

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discovery that a faulty rubber 'O-ring' was to blame for the explosion that killed the seven astronauts on board. As it turns out, this seal was susceptible to cold weather, which made it less elastic and therefore unable to perform its crucial, primary role during the shuttle's take-off.

Disturbingly, the documentary quotes witness testimony that there had been a 'suggestion' before take-off that there were in fact temperatures at which the rubber seal would fail. More disturbingly, Feynman noted that:

'the engineers at the bottom... are screaming up "no, no, it can't be this way... we haven't got enough equipment to train that many crews a year..." The people at the top who are talking to Congress, don't want to hear this, so they discouraged information from moving up' (*Horizon*, 1993).

The outcome

Feynman (1986) concluded his participation on the panel by pushing for the inclusion of his searing critique of the machinations of the upper echelon of the organization:

'let us make recommendations to ensure that [NASA] officials deal in a world of reality... they must live in reality in comparing the cost and utility of the shuttle... For a successful technology, reality must take precedence over public relations, for nature cannot be fooled.'

The Francis report shows that mistakes were certainly made in Mid Staffordshire, and of course accountability and transparency are essential for the NHS to serve patients well. However, surely, as Feynman argued so elegantly, we should be looking at why human beings are making the mistakes in the first place. Failings in care are in some cases the result of workers being personally 'uncaring'; however, we must also examine the forces driving workers to 'make apparently bad decisions' (*Horizon*, 1993). We must ensure our wards are realistically staffed and the associated workload is manageable for the training level of those staff, to allow workers to deliver the optimum level of care.

In my opinion, the answer is very simple. As shadow health secretary Andy Burnham states: 'We will never get the right culture on our wards if they are understaffed and overstretched' (Triggle, 2013). Let us hope our officials have a lazy Sunday soon. **BJHM**

This article in no way represents the views of the BBC, Horizon filmmakers, or the family or associates of Richard Feynman.

Conflict of interest: none.

Feynman RP (1986) Appendix F - Personal observations on the reliability of the Shuttle. <http://science.ksc.nasa.gov/shuttle/missions/51-1/docs/rogers-commission/Appendix-F.txt> (accessed 20 May 2013)

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