

Do we need to bring Gym Shoes to a Physics Class?

My first encounter with science was a great disappointment. I must have been about 8 or 9 and it was deemed that I should have to wear spectacles. I consoled myself in the belief that I would, at least, be able to make fire. Every little boy is a pyromaniac at heart. Imagine my horror when I discovered that short sighted people have concave lenses and concave lenses do not focus the sun's rays. Years later I watch the film "Lord of the Flies" based on the novel by William Goldring. The novel tells of a group of schoolboys marooned on an uninhabited island. They form two rival gangs and fight over the possession of Piggy's specs. Because Piggy's specs make fire. The only problem is that Piggy, like me, was short sighted, thus making the story nonsensical. Goldring got a Nobel Prize in Literature for this and other works. I guess it is called poetic license.

I was in the second year at Grammar School in the North of England when I had my first Physics lesson. I was not from an academic family. I had never been encouraged to read a book; to sit reading a book epitomised idleness! Consequently, I did not have a clue as to what this lesson on the timetable, Physics, was about! I did know about Physical Education, so my question to my fellow student, was not totally unreasonable, "Do you think we should take gym shoes?"

The door opened and in we went. It was like stepping into Aladdin's Cave. There were lenses, coils of wire, shiny copper calorimeters and multiple other toys of which I had no ken. This was magic. At that moment I knew that THIS is what I had to do.

The only problem was that I was not very bright. I realised that I would have to work VERY hard. Our Physics teacher was a terrifying giant of a Welsh man, Gronwy Jones, who turned out to be an inspiration and

later a friend. I struggled to get enough 'O' levels to get to the sixth form and I scraped into the University of Salford; not even a University when I enrolled. But I loved my Physics and I did work hard. By the second year the pennies were beginning to drop, and I went on to get a First. On the strength of this, I went on to Cambridge to do a PhD in Physics at that 'Name-Droppers' Paradise', the Cavendish Laboratory.

One of friends at the time was Stephan Hawking.

Stephan got his debilitating motor neurone disease and I went blind. Stephan and I never worked together; he was a theoretician working on Cosmology and I was an experimentalist working on fracture and the strength of materials. However, we met frequently in the local ale houses where we consumed beer together! My myopia was progressive, and I was now wearing extremely thick spectacles. They did a lot for my IQ but nothing for my sex appeal! I decided that I must have a problem and consulted my GP. He referred me to the Eye Clinic at Addenbrooke's Hospital. They advised me that progressive myopia was not uncommon but that I also had glaucoma. Glaucoma or high pressure in the eye which, if left untreated, would lead to blindness. I was prescribed eye drops; pilocarpine. This turned out to be a bit of a mistake!!!

Withing three weeks I had had a detached retina. In fact, I spent most of the next year (1965-6) in Addenbrookes having operations for detached retinae in BOTH eyes. After seven failed operations and at the point at which the Addenbrooke's staff were about to give up, my surgeon received a telephone call from England's most renown retinal surgeon, Lorimer Fison – known in the eye world as God. I vividly recall my surgeon coming into the ward at breakfast time, putting his hand on my arm and saying, "I've just had a phone call from God." Had I been more 'with it' I might have thought of some snappy answer, however, all I could manage was, "What did he say?" God was offering to give a second opinion but there was a slight catch. God does not come to Cambridge; I would

have to go to Moorfield's Eye Hospital in London. Having been on 'complete bed-rest' for months that was not going to be easy! I was duly dispatched in a National Health Service Ambulance.

It turned out – and this I discovered later – that my professor, Philip Bowden, who was a good friend of C P Snow, the novelist and scientist, had been talking about me over dinner. Snow had said, "He should see Lorimer Fison, he sorted me out and the Duke of Windsor." My prof explained that I was simply a research student and could not possibly afford to see the country's top man., to which Snow said, "I'll fix that." It seems that Lord Snow then rang Lorimer Fison and spun him some yarn about a young Wizkid at the Cavendish Laboratory who had multiple detached retinae and, "You'll have a look at him won't you?"

I arrived in London and was wheeled on a trolley into the presence of the All Mighty. He looked carefully at my right eye and said that it was worth another try. Either I could go back to Cambridge with his recommendations or I could stay at Moorfields and have it done. My rather cheeky answer was, "If I thought that YOU were going to do it, I would stay here." As he walked to the foot of my trolley he said, "But you are a National Health patient, you cannot specify who your surgeon is going to be." At that he got hold of my big toe and gave it a substantial tweak. I managed a weak, "I'll stay." Most of the patients at Moorfields are operated on by the trainee doctors under supervision. I had the big man. It took him three and a half hours and I have seen ever since.

Some weeks after my Moorfields ordeal I was back in Cambridge, back at work and driving again. My car was an old banger in need of constant coaxing. While working on the the engine outside the house I shared with five other Physicists I happen to glance up and noticed a nurse on a bicycle heading my way. Only one eye but nevertheless an eye for a pretty girl I decided that if I timed it right I could get a look at her as she passed by. I

did and my goodness, she was pretty! I returned to the problems of my carburettor only to hear footsteps and the click click click of a wheeled bicycle. I looked up and there she was looking down at me. Her words were, "What the hell are you doing, you're blind?" I recognised the voice and managed, "Lynn, so that's what you look like." Lynn had been working on the Eye Ward at the time I was shunted off to Moorfields as a write-off. Lynn and I have been married for 52 years.

As a result of my close encounter with blindness I moved from Physics to the Blind Mobility Research Unit in the Department of Psychology at Nottingham University to work on electronic travel aids for the blind. While there, I was co-opted for a while to the Smith-Kettlewell Eye Research Institute in San Francisco. During my time in San Francisco I had a haemorrhage in my left, the blind, eye. In fact, I had been blowing up balloons and there was no problem – it just looked a mess. Since I was working in an Eye Hospital environment, I consulted one of my colleagues. He took a history and looked at both my eyes. He told me that pilocarpine was no longer used on high myopes as it had been found to cause spasms in the retina leading to detachments. He suggested that I should consider suing Addenbrooke's Hospital. I informed him that I was British, and we did not do that sort of thing! However, I did learn a new word; iatrogenic.

During the seventeen years spent at Nottingham, I achieved an understanding of the informational needs of the blind pedestrian and was able to embody much of this understanding in a series of novel electronic mobility guidance devices culminating in the invention of the Sonic Pathfinder - the first guidance device for the vision impaired to make use of the techniques of artificial intelligence. I also managed a string of other innovations: hearing aids for the deaf/blind, textured paving slabs, audible and tactile displays for pedestrian crossings, speech synthesised information displays (eg the Talking Bus Stop). In 1983 I patented the, now ubiquitous, Parking Sensor; a spin-off from the Sonic Pathfinder.

In 1987 I was invited to move to Australia and take up the newly created post of Manager, Research and Development with the Royal Guide Dogs Associations of Australia.

I was able to drive until I was 60 but then had to stop due to my limited field of view. Some five years ago I was deemed to be legally blind, but I still manage to use a computer and can read normal print if the light is really good. Because of my lack of peripheral vision, unless I am extremely careful, I inadvertently shoulder-charge people! Take care if you see me coming.

Oh! and yes. No, you don't need to bring gym shoes to Physics classes.

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