

Written evidence submitted by Ros Herman (COM0128)

Down and out in Cambridge, London and Edinburgh

My name is Ros Herman. After studying mathematics and natural sciences at Cambridge University I chose to embark on a career in science writing. As a schoolgirl in London I read *New Scientist* every week from cover to cover. A decade later I was delighted to be working there as a writer and editor. While there I served as vice-chairman of the Association of British Science Writers and have twice submitted evidence to your committee. Later I helped to launch the UK's first MSc course in Science Communication at Imperial College London and ran it for three years.

I am telling you all this because I think it relevant to two aspects of your inquiry. First the attitudes science communicators have to contend with in doing their work, and secondly the career issues of women (and indeed men) in science, which have come to the fore recently in *l'affaire* Connie St Louis.

Shortly before the turn of the last century, a senior academic at Edinburgh University, asked me to set up a course in science communication for science undergraduates at Edinburgh University. He had been picking my brains for weeks on how to do this - *pro bono* of course except when I produced a draft outline, when he paid me a small fee. I was 'the only person we've got who knew anything about this'. Because when I applied for a research post at Edinburgh, my cv mentioned that, in collaboration with others, I had set up the UK's first masters' course in the subject at Imperial College, where I held the post of 'Head of Science Communication' occupying a permanent lectureship.

I said I would do it 'on the right terms'. He offered me a temporary part-time lectureship, which he was prepared to fund for one year.

He wanted me because nobody he already employed had the skills he needed. But apparently my achievements at *New Scientist* and Imperial counted for very little with this particular senior academic. But within his organisation all they qualified me for was the servants' quarters.

My response: 'I don't think I want to come back as a lecturer!' He was outraged, nearly shouting at me, 'But you haven't done anything!'

On seeing the look on my face, he half apologised: 'The only thing we value is research.'

He actually appeared quite hurt when I turned him down, not being inspired by the idea of continuing my steady progression down the academic food chain. He said, 'We'll figure something out.'

I never heard from him again, but a few weeks later he was quoted in the (THES) Times Higher Education Supplement as saying, 'If we want to teach transferable skills, we will have to promote people for excellence in teaching'.

Couldn't agree more.

While not exactly a case of 'grooming' *à la* Rotherham (and, oh yes, Oxford!), this was a really bad experience for me as you can imagine (not nearly as unpleasant and costly in both money and misery as what happened to me at Imperial, by the way, see below), but it well illustrates the issues raised within the scientific community by the concept of 'science communication'.

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Civil society cannot function without strong channels of communication. In most spheres of activity it is now well accepted that to be effective, communication has to be a two-way street, involving a constructive mixture of plaudit and reproof. The research community, in my view, has not caught up to modern standards in this regard. At least we have moved on from the 'deficit' model of public understanding of science, where the goal is merely to add to the knowledge stock of people who lack scientific training.

I am more concerned in this submission to look at what might be called the 'body language' of science, another aspect of communication now highlighted as being crucial to how people respond to the ethos and leadership style of institutions within civil society.

Most people rightly admire those whose insights and diligence enable us to understand and control the world we live in. Even scientists are coming to terms with accepting constraints on their activities imposed by civil society with regard to using animals in experiments and nuclear safety.

What I don't think they have yet quite taken on board is in their approach to how they deal with those who aspire to join their community. Public discourse aims to maximise entry to science courses, and of course the associated funding helps to support the high costs of such training. More students – more fees, and economies of scale. But what happens to them all afterwards? Is it really true that studying a scientific subject will result in a successful career? If the numbers don't add up, student recruitment strategies should alter accordingly.

Looking at it another way, we can ask the question of whether universities are research institutes that take on youngsters in order to prepare them for graduate level research? The 'natural selection' process here can indeed be 'red in tooth and claw'.

My view is that there is 'doublespeak' going on here. If they are just looking to secure the future of the research community, they should not be entrusted with shaping the lives of as many youngsters as they are currently taking on. If, on the other hand they have a wider remit, they need to consider how to guide those who do not have a solid future as researchers towards other paths.

There has been some recognition of this requirement, for example in the recommendations of the Dearing enquiry into the future of universities recognised this requirement. One of its suggestions was that institutions should provide training in 'transferable' skills. I suppose the Edinburgh academic mentioned above was doing his best to implement this recommendation when he asked me to set up such a course. You can already see the flaw in the plan. No recognition for succeeding in delivering the goal for the people entrusted with the job.

When a senior academic at Imperial College asked me to assist John Durant, a deputy director of the Science Museum, in providing a masters' course in Science Communication he may have this objective in mind, but in my opinion he was actually more concerned with the poor quality of reporting of the sciences in the media. His plan was that people with scientific training would do a better job of it. The idea was to give science graduates the skills to carry out this work. Once we shaped the course and presented the opportunities on offer we were deluged with applications. Not so much now, but throughout the 90s, the scientists trained too many students, on the coat-tails of the idea that in the new tech based world, there would be plenty of jobs. There weren't. Also, many students somehow did not get caught up with the idea of a life in research. Was it because their teachers picked favourites to nurture early on, and left the rest to fend for themselves? Not for me to say. My experience definitely put me off, but at least I got pointed towards a job in science communication, which I took up after I graduated.

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Life can be tough for students and staff at prestigious institutions such as Imperial. While employed there a slightly less senior academic at Imperial College shared with me his distress at news of a PhD student who jumped off the roof because his supervisor gave him a hard time. Another student suicide is at least marked by a memorial bench at Wolfson College Oxford. We are now beginning to hear about unexplained deaths at Deepcut and other military establishments. At the time they took place the institutions tried to bury these shaming incidents. There have also been much shameful behaviour at academic institutions (some relating to sexual harassment are just beginning to come out) but those relating to bad practice in employment at universities remain beneath the radar.

Shortly after I left Imperial a newspaper article* reported that Imperial College had been summoned to employment tribunals in the case of no less than eight women who had all been forced out by a tactic such as 'constructive dismissal' I knew of at least one more lady edged out in my department as well as myself. Neither of us took this course, so it is reasonable to assume that the eight were just the tip of the iceberg. And those were the ones who actually had jobs in the first place. Many others who were paid out of grants had no employment rights in the first place. [*Guardian, 'Equality commission to examine imperial policies' 31 July 2003; <https://www.theguardian.com/education/2003/jul/31/highereducation.educationsgendergap>]

It was after a successful career in print journalism, including nine years as a section editor and staff writer at *New Scientist*, which I left to train as a teacher after my first son was born, that I was recruited for this job. Later on I was told that I did 'a super job'. But the promotion that was promised offered after one year if the course was a success never materialised in the three and a half years I provided leadership and logistic support, hiring teachers, mentoring students, arranging and reviewing placements. I needed to have that pesky PhD of course. I embarked on one, though the supervisor I had lined up was not hired for the job because someone the physics department needed the money and I was assigned a professor of physics! Not surprisingly I never completed it. So despite my outstanding success in setting up and running the course, achieving high recruitment and good professional outcomes for its graduates, I was denied promotion.

Interesting statistic: only a quarter of students who register for PhDs complete them. I was one of the lucky ones I got rescued by a really nice academic, not at Imperial but connected with the course in the role of external examiner, who actually cared about me and encouraged me to pursue the matter with Imperial. When they would not or could not find a way of moving forward, he took me on himself and I did eventually get to write a thesis, entitled '*Lay Empowerment in Science*' and was awarded a PhD.

Before leaving London, I got another job on another science communication course. While in post at Imperial, I had helped Birkbeck College, where I had completed my MSc in crystallography, launch a postgraduate diploma course for people already in science communication jobs. Teaching took place at weekends and at a summer school. I was asked to become a staff member on this course. I was joint course director for four years while living in Edinburgh. This was possible because at that time courses run in this way qualified as University of London extension courses and could take on and fund the travel of lecturers from anywhere in the UK. Another job I took on I got was for a research funding body, producing a pamphlet of profiles of successful scientists. Very unusually I got called in by the director, Professor Richard Brook afterwards and praised for my work. It also resulted in another commission of a similar nature. More recently, I have been asked to review and edit work by academics for free, as if this was work of no financial value that I should somehow feel privileged to undertake.

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Meanwhile, the researchers continue to turn out super new ideas and technologies that regularly reshape our understanding of and power over the world we live in. Scientists were way ahead of the rest of us in terms of setting and globalising the rules by which new ideas, some seeming pretty silly at the time, could be evaluated and filtered. Modern society could not have emerged or regulate itself without their work. They deserve our respect. If they do not like it when journalists try to second guess the peer review process, I don't blame them. Dr Nick Russell, who was recruited to run the Imperial course after I left, has elegantly pointed out that the scientific community 'bridles at any suggestion of direct public influence over science' (Thomas Hardy, Richard Proctor and the dialogue of the deaf, www.lablit.com/article/82). My research showed that for the most part non-scientists had no wish to exert such influence. On the other hand, outsiders do like to have the opportunity to engage with science, whether as amateurs, such as by joining societies related to botany, or astronomy, or by engaging with consequential issues such the environment. At that time there was still confusion over issues such as the use of animals in research and the unthinking application of technologies ignoring environmental issues: they were still in the mix as 'science and society' issues. People thought they should have the right to be consulted on how this kind of issue should be regulated. Meanwhile there are other ethical questions as to when and how scientific results should be made public: the research on the effects climate change, poor environmental conditions (remember how long it took for the consequences of smoking to be taken up and dealt with?) and side-effects of drugs for example. Here scientists do have some control.

Is it the legitimate right – indeed duty - of science communicators to leak such results? My answer would be probably not, at least until the peer review process is complete. In exchange, though, it would be good if scientists committed to a code requiring them to refuse to co-operate with conditions set by funders if these seem to conflict with the public interest. A 'Hippocratic' oath along with protection for whistle-blowers would seem like a good requirement.

What about the presentation of scientists in the public domain? Scientists do not in general rely on public popularity to further their careers. There are some who take on the task of portraying the nature of their work to the public. It is also now more usual for scientific institutions to put their work forward in various ways. In Oxford, the new physics complex under construction has a number of billboards with photos, including researchers at work, describing in general terms its nature and purpose, on the fences enclosing the site. The lab round the corner conducting animal experiments may be a little more reticent. But scientists are in general more forthcoming about what they do and mostly find ways of addressing difficult issues such as this in the public domain, as well as discussing new results in a friendly way, mostly displaying enthusiasm, sometimes childish and simplistic, but mostly endearing, for their work.

What then, is the role of science communication in the public domain? We need museums to inspire children. They employ interpreters as well as curators. We need science teachers. And then there's the thorny issue of public relations – organisations, often publicly funded, need to maintain a relationship with the public. Primarily to promote science and the message, much supported by governments ever since the Butler enquiry in the 1950s, that the country needs more people to study science and embark on scientific careers. I think we need to review this message, because lots of people, not only women, have done this and come to grief. They got so far, and then got booted out of the nest. Did they cry? Maybe, with some justice.

Scientific institutions employ communicators to do public relations work, and sometimes field questions from outsiders. There are science festivals where both children and adults can advance

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their interests, keep up with new developments and be inspired and intrigued. Some 'drop-in' activities and summer schools, and societies allow for those with a higher level of interest. These sometimes lead people to undertake serious study and even change career. The ultimate aim is never, in science, the 'show' – the effort, the adrenalin, is all in the thinking, the research plan, and carrying it out. At the time it is 'shown', the serious part is over.

That presents some challenges to science communicators. Scientists are generally willing to talk about their work if journalists ask them nicely, even debate with those who disagree. They are less keen to talk about results that have not been published. Sometimes they are constrained by other considerations, such as side-effects of drugs that companies try to hide, or environmental impacts that may also be commercially disadvantageous. In general they do not see a public duty to 'whistle-blow' in such situations. I think there should be such a public duty.

In general, the reluctance of scientists to individually accept public accountability makes life difficult for science journalists. For the most part they are actually engaging in public relations. They often have to explain complex ideas in simple terms, but for the most part they don't get leaks or moderate public debate. Sometimes public sentiment does become engaged, as with climate change and animal experiments, but these days few controversies within science make the headlines. Because of this, the science correspondents are for the most part held in low esteem both within their own profession and by the scientists. That said, scientists are part of civil society. When they demonstrate their disengagement with political correctness in their own profession, they can become legitimate targets for correspondents looking for a story. Connie St Louis, senior lecturer in journalism at City University, who specialises in science journalism, recently jumped on such an opportunity.

Can scientists ever be wrong? The truth is, they are almost always wrong. Everything they assert is a gamble with nature. I feel that what Tim Hunt said was exactly in that spirit. Their other characteristic is that they draw a strict boundary between assertion and proof. But they need to have the freedom to play. That's their habit of mind. Sometimes it spills over into the world of gossip. And then there's the age factor. Maybe the scientific world is indulgent to its veterans, of which Tim Hunt was definitely one. Should journalists take into account the history and cultural trajectory of their subjects - subjects or victims? Arrogant or naive. Or both?

Many of the things scientists said to me when I was starting out were equally crass, though they weren't directly sexist. There weren't any women in their labs, so a young woman showing an interest in their work was quite unusual - I hope not totally unpleasant - experience. I regarded it as an obligation not to take advantage of their frankness and naïveté. In a funny kind of way, there was a sense of trust and future co-operation. She had a good story, generating headlines. It was on a valid theme – men's attitudes to women in the lab, who 'cry' when things go wrong. He didn't say they shouldn't be there, just that it was more difficult to cope with than a - presumably more stoical - male in the same situation. Thus implying Tim Hunt might prefer that prospect and so discriminate against them. The scientific community, having failed to discredit the truth of the report, and unable to challenge the truth of such prejudice with either statistics or contradictory evidence, turned on Hunt himself, depriving him of posts of responsibility to which he had been appointed.

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Tim Hunt's mistake was not so much that, like many others, he attributed negative characteristics to the way women worked in science, but that his stereotyped thinking was so much to the fore that it came to his lips in the course of banter over lunch.

In this sense St Louis was on point to pick up on it. The reaction from the institutions where Professor Hunt, a Nobel laureate, was to relieve him of his responsibilities. My reading of this is that they were shocked, not so much that he thought that way, but rather that he forgot himself so far as to break the line of the politically correct position that there is no sexism in science. Opportunities to air and progress discussion of the issue in a useful way were completely missed.

Even more so because St Louis's behaviour in focusing on this particular quote was also roundly condemned. Because the Association of British Science Writers decided after extensive internal discussion and deliberation not to censure or expel her, its President, Professor Colin Blakemore, resigned from the post. Well, perhaps this represents a 'coming of age' for the organisation, which will probably now have to do without a benevolent uncle forming a link into the scientific community. Maybe this is in keeping with its current encouragement of 'investigative' reporting, but, on the other hand it's really ironic that such a tawdry story has precipitated this disruption in the way the system works.

I don't like the way St Louis exploited her opportunity, but I can't help admiring her spunk. It made me think of the at least equally tawdry treatment meted out to me for having the temerity of being an assertive woman in a male-dominated world, even though I enjoyed the apparently irrelevant status of an award-winning science writer and a qualified and experienced teacher tasked with training a new generation of science communicators.

I got an equally dismissive and derogatory kind of response when I published a book documenting my research at New Scientist entitled *The European Scientific Community*. What business is it of yours to examine us? was the general theme of the review written by the then head of the EPSRC.

The public has a stake in these issues and deserves to be engaged with in a serious way. The elephant in the room is not just women it's the whole level of wastage of enthusiastic young minds, like nuclear waste it's toxic, accounts need settling. I prepared a lot of refugees from science for jobs they now enjoy. I'm proud that I got out before I preparing even more of them for the frustrating task that obtaining satisfying and suitably rewarding work in this area can be.

By the way, I never cried. But now I have no tears left. Call it post-traumatic stress disorder if you like.

After a while, I did find other work – managing a suite of technical manuals in industry, creating and managing the databases I learned to use while working on my PhD.

I was lucky enough to find suitable courses to develop my skills. In particular, I had the privilege of taking part in a wonderful scheme called Women into Science and Engineering. Based on the observation that many of those trained in such subjects had apparently vanished from the workforce, their expensive training completely wasted, they established a network of trainers and mentors and a methodology for preparing as many as possible for re-entry into suitable jobs. An excellent module delivered through the Open University provided regular interaction with a course leader who was willing to deal with difficult issues, encourage and maintain a positive attitude, and help to formulate realistic goals. After a while, a staff member of the scheme informed me about a suitable vacancy at a local company, and I got the job. I worked there for three years.

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In my view, such support should really be available to graduates at all stages of their career, helping them to make transitions between sectors as appropriate. Maybe you could consider making a recommendation in this area. Through developing insight into employment patterns in science and engineering, such an agency could also develop dialogues about the workings of the system within government and in the public domain.

More broadly, I don't think you should try to meddle with journalism and the media. The Hutton inquiry was a travesty of justice, just capping the ridiculous condemnation of the BBC and Andrew Gilligan, who did a great job reporting the 'dodgy dossier'. When I heard him on the radio I immediately knew that his editor had made a bold decision to allow him to speak the way he did. The reaction by the government was ridiculous and dangerous – look what happened to David Kelly, for example, and the Hutton report a travesty of justice. And now the tissue of lies is coming apart – the Chilcot report - is still not published.

Maybe a ticking-off from you will redirect the way scientists deal with the media – I doubt it, and they have the right to run their affairs the way they see fit. I am much more concerned with the issue of careers in science: the recruitment, education and training, career advice and professional development within universities and research institutes. I want to put in a good word too for whistle-blowers who highlight deficiencies in the system, whether in regard to career or concealment issues. In a way I think we could assign Connie St Louis this accolade. The issue she raised was an important one, yet not addressed seriously in the public domain. Is this a cover-up on the part of the scientific community? It's certainly been 'pushed under the carpet', at the very least. I hope I have shown that it is a matter of public interest to cast light on the man- (and woman-) power issues of the world of science and engineering. Please could you launch an inquiry into this? It would indeed be a positive outcome from this inquiry. Thanks.