



Takeaway Science

Women in Science Today, a Latter-Day Heroine and Forensic Science

Mike Bullivant

Welcome to takeaway science, one of a series of short podcasts produced by BLAST! The Open University's Science Faculty's Outreach Group. This particular podcast comprises three short audio sequences. Later in the podcast we chew the scientific fat with Kathy Sykes, Collier Professor for Public Engagement in Science and Engineering at the University of Bristol. Now this is followed by an interview with Doctor Christine Heading, OU Associate Lecturer in Science and winner of the Royal Pharmaceutical Society of Great Britain's 2008 Silver Charter Medal. But first BLAST! Project manager Emily Unell caught up with Professor Alan Bassindale from the Department of Chemistry and Analytical Sciences at the Open University to talk about the OU's new short course "Elements of Forensic Science". This first sequence runs for just over five minutes. Here's Emily Unell.

Emily Unell

Alan, thank you very much for taking time to talk to us. Why has the Open University developed a course on forensics?

Alan Bassindale

Well in the science faculty we are always looking for courses that have got a wide general appeal and also high scientific content. Forensic science is the type of subject that mixes both of those. It's got huge appeal through popular media and everybody loves "whodunits" and it's also got a very high scientific content.

Emily Unell

Is there a particular demand for courses in forensic science?

Alan Bassindale

There's a huge demand for courses in forensic science at all levels. A lot of universities do forensic science as a First Degree. There is also Masters Degrees in forensic science. A lot of people do Ph.D.'s. We are filling a different end of the market. We are looking at people who don't know very much science yet but who want to learn about it and this is a great vehicle for introducing science as well as introducing the fantastic subject of forensic science.

Emily Unell

There are lots of television dramas such as CSI in the US and "Waking the Dead" in the UK and they show a heavy use of forensics to solve cases. Is it really like that in real life?

Alan Bassindale

Well yes and no. No in the sense that what you've got in "CSI" or something like that is a half hour to an hour programme in which crime is committed, solved, person ends up in court and of course that could take months or years in real life. And similarly with the scientific analysis it can take weeks, it can take months to do analyses. Yet you have to show them very quickly in the TV. In fact programmes like CSI have introduced a new concept into court called the "CSI" effect and this is that juries now know much more about forensic science than they ever did but also they have very high and often unrealistic expectations as to what forensic science can do. So it's a good and it's a bad thing the way that these programmes work. But they've certainly brought forensic science into the public eye.

Emily Unell

Is there something about scientific evidence in particular that makes it more reliable perhaps than other types of evidence?

Alan Bassindale

No. I don't think it's necessarily more reliable. There is the old thing that science can't lie.; you make a measurement and you've got a particular output or an outcome from that measurement. That's true to a certain extent but it's not necessarily foolproof. I mean we've shown in lots of cases recently that things like the new technique of low copy number DNA has got its upsides and its downsides. It's not the science. It's the interpretation. Every time you have a measurement you've got a person at the other end of it making a decision. So it's not necessarily more reliable but when used properly forensic science can give you very, very clear answers to questions through things like fingerprints and DNA.

Emily Unell

Do you think that there's a danger in being too reliant on forensic evidence?

Alan Bassindale

There would be if cases depended wholly on forensic science but fortunately most jurisdictions including the UK don't allow you just to use forensic evidence in court. The way that the process works is that somebody has to take a decision on what needs to be measured, weighed, analysed. You don't go into a crime scene and examine everything that's there. You couldn't possibly do that so the detective work is in deciding what to analyse, how to analyse it. You can't rely wholly on forensic evidence. You can only add that to the detective work, to the foot slogging, to the statements of witnesses and all that. So again it's part of a whole process. But it can lead you in the right direction, finding a fingerprint and matching it with the fingerprint database; matching DNA with the DNA database. That can often help you in the process of determining who to question and who was at the crime scene.

Emily Unell

And again, going back to the new OU course, do you see courses like this as an introduction to often difficult or abstract concepts?

Alan Bassindale

Short courses can introduce a lot of new - of new concepts but this is not a vehicle just for teaching science in a covert way. This is a course about forensic science. It's for those who are interested in forensic science. But it also opens up the opportunity for them to learn about the science behind it. So it does introduce difficult concepts but it is - it is a course about forensic science. I should just add that it is also quite a limited course. It's only a ten-point Open University course and forensic science is a massive subject. So what we've done is we've concentrated on certain aspects of forensic science, things like fingerprints, DNA, body fluids. The course is first and foremost for those who really want to know about forensic science. And I would recommend it to anybody who has got an interest in reading newspaper articles, watching TV, because quite often they give you part of a story. If you read this course you will learn a bit more about what's underneath a DNA profile. What does it mean when they say, "there's a match" or a "partial match"? What does it mean when they say it's a "billion to one chance" that somebody was at the crime scene?

Mike Bullivant

Emily Unell talking there with Open University Chemistry Professor Alan Bassindale, about the OU's new ten point course, "Elements of Forensic Science". As Alan explained, this new Level One Course is aimed at those interested in forensic science and the basic scientific principles involved. If you want to learn more about this course or any other OU course for that matter log on to [www3](http://www3.open.ac.uk/study), that's the numeral 3, www3.open.ac.uk/study and just follow the links. The second sequence in this take-away science podcast features a brief chat with Professor Kathy Sykes, holder of the Collier Chair for Public Engagement in Science and Engineering at the University of Bristol. Kathy has just been awarded an Open University Honorary Degree and BLAST!'s David Smith caught up with her on a windy day at this year's Cheltenham Science Festival, of which she is co-director. This second sequence runs for just under four minutes

David Smith

I am here today with Kathy Sykes, a Professor for the Public Engagement in Science and Engineering at the University of Bristol, a physicist and a well-known science television presenter. Kathy, who is your hero or heroine of science?

Kathy Sykes

Well I have quite an unlikely heroine of science. She's a Victorian woman. She's called Angus Marshall and she wasn't a scientist at all but she was an amazing cook and kind of entrepreneur and she was interested in science. So she just did some astonishing – she created amazing, amazing recipes but she attended the Royal Institution's Lectures, for instance and she saw scientists doing rather exciting things with these liquefied gases: liquid nitrogen and things like that. And it was her who came up with some of the ideas for – she asked 'oh perhaps I could use these?' And she spoke to the scientists at the time and actually did things like tipping liquid nitrogen into ice cream mixtures and freezing them instantly. And you know it was kind of her idea, she befriended scientists, she tried this out. And she even – she learned about refrigeration and she devised and designed her own small refrigerator unit so that Victorian women who were cooking, because it was mostly women who were in charge of the household's cooking at the time and they had much more access to sort of easy to use not only refrigeration units but also ice cream making machines. So she was a human being, interested in food, interested in empowering women, learning about science, befriending the scientists and then coming up with these amazing devices that made life oh easier and more exciting for other women who were like her. So I think she's - she's an absolute heroine. Not only that she was incredibly lively and loved dancing and I always like that in a human being.

David Smith

How would you encourage other people to participate in science?

Kathy Sykes

I would suggest to parents that the more you can do to encourage your child's curiosity the better. I think it's really easy for parents and indeed scientists to give answers that make it sound as though we know everything about the world. You know say that 'oh there are three states of matter' when actually you know there are four or five or twenty or loads more. Or to say 'this is certain'. And actually the better we are at saying 'mm - I don't know', or 'some people think it's like this', the more open ended that we make things and the less certain we sound, the more space we give for kids to be creative. And there's some educational research that supports that the better we get at saying 'here's a possible answer but there are other answers and actually you could come up with an answer yourself,' the better we get at doing that the better we encourage kids to be creative. Because the thing is about the world and the thing about science is that we don't usually know stuff definitely. We think we know and we think we have ideas but very often you get better ideas and find out that we were wrong. So helping kids understand that this world is uncertain and their curiosity can help them to find out more about it. I think that's key.

David

Thank you ever so much for your time.

Kathy

That's okay.

Mike Bullivant

David Smith there talking with Kathy Sykes, co-director of the Cheltenham Science Festival. If you want to develop your interest in science why not consider taking the Open University's Level One Course "Exploring Science". For further details of this introductory Science Foundation Course or any other Open University course log on to [www3](http://www3.open.ac.uk/study), again that's the numeral 3, www3.open.ac.uk/study. Well, the third and final sequence in this take-away science podcast features an interview with Doctor Christine Heading, an Open University Associate Lecturer who teaches both undergraduate and post graduate science courses. Christine was awarded the Royal Pharmaceutical Society of Great Britain's 2008 Silver Charter Medal for her work in promoting women in pharmaceutical careers.

This final sequence runs for just six and a half minutes. Here's Emily Unell again.

Emily Unell

I am here with Christine Heading. She is an Open University Associate Lecturer and a pharmacist. Christine has just been given a prestigious award by the Royal Pharmaceutical Society. It's the Silver Charter Medal for her work in both pharmacy and also promoting women in pharmacy. Christine, can you tell me a little bit about the award?

Christine Heading

Well the award has been available since the early 1960's and is one of two awards made annually by the Pharmaceutical Society. There is a Gold medal for contributions nationally and a Silver medal, which I have been lucky enough to receive, which is given for contributions to specific area of pharmacy. In my case it is particularly for work with women pharmacists.

Emily Unell

I gather that's the National Association for Women Pharmacists?

Christine Heading

It's a National Association for Women Pharmacists although men pharmacists are welcome to join.

Emily Unell

What sort of work does it do the National Association?

Christine Heading

Well it's been around for a hundred and three years now and basically it devotes itself to the issues that are of interest to women pharmacists and these tend to be in two strands. One strand is an interest in gender medicine and the other is focusing on career issues for women pharmacists.

Emily Unell

Why do you think it's important to have a specific representative organisation for women?

Christine Heading

Well I think, in theory, it should not be necessary but we have had Equal Opportunities for a long time and pharmacy has been very good at promoting equal opportunities but they haven't focused on equality of outcome. And that is where we think there's a great necessity to have a women's organisation that can draw attention to the fact that women aren't thriving as well as they should.

Emily Unell

And what sorts of things, do you think, stop women thriving?

Christine Heading

I think the main problem is that so much regulation and planning is done on the basis of male career models.

Emily Unell

Right

Christine Heading

And organisation as well is done on male career patterns and therefore women don't thrive in those patterns

Emily Unell

What changes would you like to see to make that more open and make women more able to compete in that environment?

Christine Heading

Well basically you need gender awareness at all levels of decision making and policy making so that consideration is given as to whether there are any gender issues. This should be part of a broader and diversity awareness I should add but you certainly need it for women so that every decision – policy decision taken can be assessed in terms of its impact on men and women

Emily Unell

Do you think there is a particular issue about women returning to a career in science?

Christine Heading

Oh there is definitely an issue and getting back into pharmacy as such is not too difficult to get back in but on the other hand if you want to get back into pharmacy as a scientist, perhaps within the pharmaceutical industry, it is rather tricky. Certain avenues are available such as going into regulation and writing and that aspect of applied science but if you want to get into laboratory sciences it's very, very hard.

Emily Unell

Do you have any advice for women who might be returning to work in a pharmaceutical industry?

Christine Heading

Yes. Basically it is possible because there is a shortage of good scientists. So I think you have to network. You have to do a lot of research and find out where the opportunities are and it's certainly possible to get into the applied areas such as I said in terms of writing, regulation, pharmaco vigilance, these sorts of things. Companies are quite happy – reasonably happy – about employing people on a part time flexible basis, particularly if you go for not the main, big names but those that work as consultancies and agencies. They are particularly welcoming of part-timers

Emily Unell

And how did you get into working for the Open University?

Christine Heading

Well I've been working previously with the University of de Montfort and some of their distance learning programmes and that came to an actual end as their course ceased and I was looking around and was aware of the Open University and I saw options there. But I should say I have a background in teaching in what is now the University of East London, where we had a great focus on part time students.

Emily Unell

It sounds like you teach on a lot of courses so I am guessing that you enjoy working with the OU. What is it that you like about the Open University?

Christine Heading

I like a lot of things. I like its flexibility in terms of its attitudes and the opportunities it offers. I like the quality of students because they are all dedicated. I greatly enjoy the mix of staff that I meet and associate lecturers represent a huge diversity of people in terms of stages in their career, their expertise. Well they all have expertise but some have much more experience than others. And so it's the general ambience that I enjoy and connecting with the students as well.

Emily Unell

Thank you very much

Mike Bullivant

Emily Unell talking there with Christine Heading, OU Associate Lecturer in Science and winner of the Royal Pharmaceutical Society of Great Britain's 2008 Silver Charter Medal.

Well that's the end of this particular podcast brought to you by BLAST! – The Open University's Science Faculty's Outreach Group. For other podcasts in this take-away science series re-visit the Open University Science Faculty Website at www.open.ac.uk/science. If you want to find out more about the science outreach work carried out by the OU visit the BLAST! Web pages at blast.open.ac.uk. Well, that's all for now so from me, Mike Bullivant, adios!