

5 STRIPPING DOWN SCIENCE TO THE BARE ESSENTIALS: THE BARE-FACED CHEEK OF HOW MEDICINE TURNED INTO MEDIA

New technologies have created new opportunities for public engagement. **Chris Smith**, for example, has used radio and, more recently, podcasting technologies to reach large numbers of people – and not just those who would normally be targeted by science communication activities. His work is good evidence that there is a significant appetite for science – if it is presented in ways that appeal to consumers.

Take an onion, chop it finely, add water, half a pint of washing-up liquid (lemon-scented variety optional) and a handful of salt, and simmer at 60°C for 10–20 minutes. Pour the attractive-smelling mixture through a coffee filter and collect the juice. Cool, add fresh pineapple juice, and incubate at body temperature for ten minutes. Meanwhile, chill some aftershave in the freezer, and then gently pour twice the volume of ice-cold aftershave over a sample of the onion/pineapple ‘jus’. Before your eyes a squidgy substance, not dissimilar in appearance to snot, begins to appear.

This is the recipe for extracting large amounts of DNA from an onion using simple ingredients you can find at home. It’s also the recipe that spawned *The Naked Scientists Radio Show*, which has subsequently become one of the world’s most downloaded science podcasts.

I’ve always been very keen on science, and particularly talking to people about it, so back in 1999, when someone emailed me asking if I would be willing to help out at the Cambridge Science Festival by giving a talk or demonstrating something, I jumped at the chance.

I set up the onion-DNA demonstration a bit like a cooking programme and invited members of the audience to ‘come on down’ and help with the procedure. While volunteers vigorously sliced and diced, blinking red-eyed through the onion vapour, I gave a short talk on the nuts and bolts of life’s recipe

book. The result was a spectacular handful of onion DNA, a rapt audience, and a phone call from a local commercial radio station inviting me for an interview.

I took along a colleague to the radio station for moral support. Between us we managed to turn what was supposed to have been a five-minute interview about DNA into two hours of light-hearted scientific banter, punctuated by regular music breaks. The radio station was sufficiently impressed to ask us back a week later, and from there the concept of the Naked Scientists was born.

As luck would have it, at around the same time the Biotechnology and Biological Sciences Research Council (BBSRC) launched a new scheme to promote public understanding of science. I negotiated to buy a year’s airtime from the radio station at a (very) reduced rate, and we wrote a grant application to the BBSRC to pay for it. And in January 2000, the BBSRC agreed to fund our project, and the show, which we christened *ScienceWorld*, was on the road.

I’m certain we sounded terrible to begin with. The transition from guest to show host is a difficult one. You suddenly have to worry about playing ads and jingles at the correct times, getting the levels right, answering the phone, and all the time you’re trying to talk intelligently about complicated subjects and keep the conversation going.

The website was taking a quarter of a million hits a week, admittedly many of them for the word ‘naked’.

Although the learning curve was steep, we improved rapidly and before long it was really starting to hang together. We turned the show into a light-hearted look at what was happening each week in the world of science, technology and medicine, interspersed with popular chart music. We succeeded in dishing out ‘Radio 4’-type material to a ‘Radio 1’-type audience who would not normally be exposed to educational science radio programming. We also included a few funny stories each week, such as the one about a Reliant Robin seen parked all over York with an industrial-sized sack of potatoes in the passenger seat. It turned out that the driver weighed over 35 stone and, without the counterbalancing effect of the potatoes, the three-wheeled car was prone to rolling over on bends. Naturally we used this story to highlight the importance of eating a balanced diet...

We saw the number of people tuned to the station jumping by 50–100 per cent when we came on air. More and more people were phoning in to enter the competition and to ask us questions. By the end of the series the radio station had been taken over by a new company, but since our ratings spoke for themselves we were offered the chance to make another series. As we all had deadlines looming, including a thesis to complete and clinical finals, we took six months off to get everything finished.



CAFÉ CULTURE

Café Scientifique is not a location, it is an idea, “a place where, for the price of a cup of coffee or a glass of wine, people meet to discuss the latest ideas of science and technology which are changing our lives”. This idea, the brainchild of Duncan Dallas (inspired by the French Cafés Philosophiques), is proving an international success.

Like many great ideas, its success owes much to its simplicity. Show up at the organiser’s chosen venue – a café, bar or some other welcoming locale – grab a glass of your favourite tippie and take a chair. For around 20 minutes, an expert speaker (scientist or science writer) waxes lyrical about their chosen subject →

CAFÉ SCIENTIFIQUE

Funding

£175 000 (2001, Impact Award) – Café Scientifique Development Project

£9550 (2004, People Award) – Café Scientifique National Conference

£178 150 (2005, Society Award) – Establishing a network of ‘Junior Cafés’ in UK schools

Project lead

Duncan Dallas

More details

www.cafescientifique.org.uk

Left: Dr Simon Archer talks about body clocks at a Café Scientifique in Manchester. *D Kampfner*

Meanwhile, we got support from the BBSRC for a further series, and to develop a companion website (www.thenakedscientists.com). The idea was to maximise the reach and educational potential of the material by archiving it in text and audio formats on the web. The text transcripts would then provide ‘search-engine fodder’, helping visitors to locate items of interest, while the accompanying downloadable audio meant that they could listen to items being discussed. The renamed *Naked Scientists Radio Show* then hit the airwaves for the first time in the autumn of 2001.

For the new series we focused the show not just on science news stories but on an interview with a guest scientist too. We signed up Richard Dawkins, Sir Alec Jeffreys, Susan Greenfield, Steve Jones and even James Watson. The audience loved it, and so did the competition, as it turned out.

Between us we managed to turn what was supposed to have been a five-minute interview about DNA into two hours of light-hearted scientific banter, punctuated by regular music breaks.

The BBC had been listening to us for a while and in 2002 offered to move the next series of the show to BBC Radio Cambridgeshire. This would see us grow from talking to a few thousand people around the city and outlying villages to talking to an entire county. More importantly, through the use of local radio, we would be able to continue to reach a subset of the population who would not normally be exposed to educational science radio programming.

By this time it was obvious that we were on to something. The website was taking a quarter of a million hits a week, admittedly many of them for the word ‘naked’, but at least we couldn’t be accused of preaching to the converted, and emails were coming in from people all around the world who were enjoying listening to our shows. It was clear that what we were doing had the potential to be much bigger. This was confirmed when a contact with BBC Essex led to an invitation to make some special two-hour bank holiday programmes for them.

Two hours seemed an awfully long time but my initial fears evaporated when those shows were broadcast live at peak time in May and August 2003. They drew an enormous audience response; people of all ages from nine to 90 phoned in with questions like “How many pieces of toast can you make with the energy in a lightning bolt?”, “Why does my car do 8 miles to the gallon more with an air-filter full of mothballs?”, and “How many organs can I donate and remain alive?”. They were certainly one of the most enjoyable experiences I’ve had with this project mainly because I suddenly realised what it could achieve. Another major benefit of our success on BBC Essex was that the managing editor, a wonderful lady

called Margaret Hyde, was sufficiently impressed by what we were doing that she persuaded all of the other BBC radio stations in the region, with a potential audience of 6 million, to take the new series from September 2003.

When this series launched, funded by a COPUS grant from the Royal Society, we switched to a purely talk-based format to increase the time available for content. We opened each week with a digest of topical science news stories, answered general science questions live from listeners and interviewed guest scientists who joined us in the studio to discuss their work. Quickly our brand of ‘serious science with a sense of humour’ caught on, and we picked up regular listeners all over the world, including people in Australia, Canada, California and even Japan – one young lady in Tokyo phoned in to ask why crying makes your eyes go red. She defiantly told our telephone operator: “You’d better put me on the show because I’ve stayed up until 4 a.m. to call you!”

In early 2004 we paused for six months while I took up a Winston Churchill Fellowship and joined doyen of radio science journalists Robyn Williams at the ABC in Sydney for six months. While there, in addition to making programmes about landmine-detecting GM cress plants and the origins of HIV, I began contributing live science commentaries to the *Radio National Breakfast Program* each Monday morning, as I have continued to do since I came back to the UK.

A new series of the *Naked Scientists* for the BBC Eastern region followed, which was broadcast between October 2004 and April 2005, along with launch of a series of live weekly science reports, which are currently broadcast nationally each Monday morning, on BBC Radio Five Live.

One young lady in Tokyo defiantly told our telephone operator: “You’d better put me on the show because I’ve stayed up until 4 a.m. to call you!”

The COPUS grant ended in April 2005. It was clear by this time that there was an unmet need for science radio programming of the type that we were delivering. But to fill that need would require significant effort, so in early 2005 I applied to the Wellcome Trust for funding to support a full-time producer. In June 2005 I was awarded a £200 000 Society Award, and the BBC agreed to return the show to the air from October.

In the interim I began to experiment with turning our back catalogue of archived shows into formal podcasts, with the aim of growing a podcast audience prior to the launch of the new series. For the uninitiated, a podcast is simply a digital audio file that is available on the internet and to which you can ‘subscribe’. It’s very similar to a magazine subscription in that whenever the podcast producer

→ before a break, allowing glasses to be recharged. Then the questions start and the fun begins...

Members of the public have direct access to an expert, on a relaxed verbal battleground in which thoughtful, probing and frequently difficult questions are dealt with in everyday language.

The British Council’s adoption of the format helped to spread the cafés globally and, as testimony to their success, they’re springing up everywhere. From the first cafés held in Leeds in 1998, there are now well over 150 of them globally, including in Brazil, Japan, Russia, Denmark, Costa Rica and the USA.

Dallas himself has no idea precisely how many there are; but then the viral

explosion of cafés fits in perfectly with the ‘bottom-up’ ethos of the original idea. Anyone can start one – anywhere they want – with zero funding (speaker expenses are provided by a collection from the attendees). All necessary coordination is achieved via a website.

Underpinning the success is the public’s genuine curiosity, a real hunger to find out more about the increasing number of scientific issues touching on their health, technology and planet. More than that, the format of the gathering is appealing: when people engage in science, they prefer situations that are relaxed, social, interactive and not intimidating in the way that more formal ‘learning environments’ can be. →

Right: Duncan Dallas (far right), originator of the Café Scientifique concept. D Kampfner



publishes a new edition of their programme, a copy is automatically delivered to your computer without you having to go and retrieve it manually. You can then listen at your desk, or transfer the material to a personal player, such as an iPod, for portable consumption.

As soon as the *Naked Scientists Podcast* came online, the shows from our previous series went to the top of the Apple iTunes charts. We became a 'featured podcast' and reached the dizzy heights of the top 30 in most countries.

There has been a downside though, which is that the quarter of a million monthly downloads of our programmes amount to a massive 4 terabytes of data, which is nearly crippling our web server.

Podcasting has been a great leveller. It's brought down the barriers that have constrained traditional broadcasters and empowered listeners.

On the basis of this success, in mid-2005, I approached the journal *Nature* with the idea of producing a free weekly podcast to supplement the contents of the journal. This would comprise interviews with the publishing scientists about their work, together with coverage of the week's most significant science news stories. The *Nature Podcast*, which this became, launched in October 2005 and was the world's first example of an international science journal producing an audio podcast to supplement their published content. It too has since reached the iTunes top 30 and is moving over 40 000 copies of the show per week.

Podcasting has been a great leveller. It's brought down the barriers that have constrained traditional broadcasters and empowered listeners. Now you can hear what you want, when you want, worldwide. It's also revitalised people's awareness of and interest in the power of radio as a broadcast medium, and it's reshaping the media landscape. The download data generated by people subscribing to podcasts are providing some of the first genuinely objective measures of radio listening, and it's also allowing the popularity of certain programmes, which would never normally compete with each other, to be compared. For instance the *Naked Scientists*, which would previously have been confined to regional radio in a small corner of the UK, now stands in the charts alongside national radio giants such as Australia's *The Science Show* and Radio 4's *In Our Time*.

Significantly, the *Naked Scientists Podcast* has invigorated the radio show. It provides a valuable source of content because listeners worldwide now submit questions and suggestions for programmes, submit their own short science podcasts for broadcast within our show, and volunteer to appear as interview guests.

The impact of radio and audiovisual programmes is about to explode because now a show will have a lifetime that exceeds the time it is on air.

But is this a flash in the pan? The answer is definitely 'no'. The internet will grow to embrace this technology. Brace yourselves for the arrival of 'enhanced' podcasts – audio shows with images attached, and also video podcasts. What this means for science communication is that the impact of radio and audiovisual programmes is about to explode because now a show will have a lifetime that exceeds the time it is on air. Through the convenience of on-demand viewing and listening, more people will be able to access more quality science programming than ever. Which means that, while sitting in that traffic jam or on the train, there's now going to be an alternative – day or night, you can switch on the *Naked Scientists* instead...

Chris Smith is Clinical Lecturer in Virology at the Department of Pathology, Cambridge University.

Acknowledgements

With grateful thanks to: Margaret Hyde and Tim Gillett at BBC Essex; Jason Horton and Graham Hughes at BBC Radio Cambridgeshire; Robyn Williams, Lynne Malcolm, Polly Rickard, David Fisher and Jacque Harvey at the ABC; the Royal Society, the BBSRC and the Wellcome Trust for funding my project at various times along the way; and my wife, Sarah, for sharing her life with a naked scientist...

→ Dallas also alludes to another aspect of the cafés' success: that science may have reached a point where it is shifting cultural perceptions of what it means to be human. These are profound issues, provoking many to reflect on life's 'big questions'. The informal forum of a café allows people to talk with experts and, importantly, among themselves, about their concerns and hopes for our future.

The unprecedented growth of Café Scientifique continues apace. It is also flexible, adapting to suit different cultures. Events are being organised for ethnic minorities, groups that tend to have little contact with traditional science communication. The massive scale, reach and impact clearly illustrate that, with the right format, the audience will come running.

Society Awards

Upwards of £50 000, Society Awards come in two forms: activities and research. **Activity awards** support large-scale activities, such as conferences, art projects, workshops or educational resources. The hope is that the activity will make a sizeable, nationwide impact on public engagement with biomedical science.

Research awards are of the same financial scale but are intended to support academic research that advances knowledge of public engagement in the biomedical sciences.

www.wellcome.ac.uk/engagingscience

Right: The audience has full access to speakers at Cafés Scientifiques. *D Kampfer*

