



The  
**Royal Society  
of Edinburgh**

The RSE's Young People's programme of events aims to promote science, society and culture.

Visions for the Future is a project of the British Association for the Advancement of Science.

If you would like more information about the project or further copies of this or other reports, contact:  
Caroline Chipperfield,  
Visions for the Future,  
The BA, 23 Savile Row, London W1S 2EZ  
Tel 020 7973 3071  
Fax 020 7973 3051  
E-mail [caroline.chipperfield@the-ba.net](mailto:caroline.chipperfield@the-ba.net)

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*Sir William opens the conference*

**O**n 18<sup>th</sup> June a group of forty-six 5<sup>th</sup> and 6<sup>th</sup>-year pupils from West of Scotland schools met at the University of Glasgow to debate medical, technical, sociological and ethical aspects of mobile phone usage. They heard a panel of Scottish experts and then, after working in small groups, presented the experts, their teachers, invited guests and journalists their own views on the control and development of mobile phones and masts. Organised as a joint BA Visions Conference and RSE (Royal Society of Edinburgh) Young People's Discussion Forum, the event took place under the able and knowledgeable chairmanship of Sir William Stewart. Sir William chaired the UK Government's Independent Expert Group on Mobile Phones (The Stewart Committee) and is currently President of both the BA and the RSE.

Before the event, all the participants had been sent background reading for preparation. This included the summary of *Mobile Phones & Health* (the report of the Stewart Committee), a number of recent press cuttings about various aspects of mobile phones and some potentially useful website addresses.

On arrival, they were given a short questionnaire about mobile phone use, safety and associated technology. These were returned at the end of the morning and the results analysed for presentation in the final discussion session.

Before the conference, Sir William had said:

*"Young people are among the main users of mobile phones, and it is essential that they have as much information as possible to decide how they want the technology to be developed and managed in the future."*

At its close, he told one of the journalists present:

*"I thought they were brilliant and they are the future, so it's very important we listen to what they have to say. It was a very constructive meeting and they were a credit to their schools."*

By coincidence, there were developments in the month following the conference. First was the announcement by the major phone companies that they will, in future, provide information about the levels of radiation emitted by their phones in the literature accompanying each new handset – but not on the phones themselves. Then came the Scottish Executive's introduction of new regulations requiring planning applications to be made for the siting of all ground-based mobile phone masts in Scotland. This will not apply retrospectively, but has been introduced to standardise practice across the whole country.

*Fiona Selkirk  
the BA Regional Officer,  
Central & South Scotland*

## From the Experts – the Facts and some of the Issues

The first session on how mobile phones work was led by Dr James Irvine of Strathclyde University. After outlining the physics behind the basic operation of the Global Satellite Monitoring mobile phone system, covering radio channels, multiplexing, and coding, he reminded everyone that, in the USA and many other countries, 'mobile' phones are called 'cellphones'. He then went on to discuss the 'cellular' principle, explaining about signal registration, scanning and hand-over. The final part of his presentation looked to the future and, in particular '3G', the search for capacity for new services, advances in transmission technologies and the effects these developments will have on the number and size of cells.

After the physics, there was a short refreshment break before tackling the biology – which was discussed by medical physicist Dr Dick Lerski from Dundee University's Medical School. He explained how the brain is affected by the radiofrequency radiation emitted by mobile phones in normal use and the two types of effects this radiation may have. While there is no doubt that the brain tissue can be heated by the radiation, it is possible that there may also be other more subtle, non-thermal, effects. For example, these might involve the radiofrequency wave resonating with delicate cell structures and thus damaging them. The technology is too new



for there to have been a lot of research carried out into the biological effects – and one result of the Stewart Report is that much more is now being done. Dr Lerski was, however, able to assure the audience that it seems very unlikely that the radiation emitted by mobile phones can cause the same type of direct damage to the DNA in the cells that can be caused by X-rays.

Ethics and sociology followed the physics and biology. John Fellows, who had been one of the Lay Members on the Stewart Committee, outlined and commented on some of the many

outstanding public concerns regarding mobile phone technology. In particular, he highlighted that large numbers of people are concerned about the planning regulations for base station transmitters and the positioning of these sites near to schools in particular. He also discussed concerns many have about the use of mobile phones by young people. He closed by looking at what has been done – by the industry, by Government, by pressure groups and by consumers – to address these concerns since last year's publication of the Stewart Report.

## From the Young People – the Views and Opinions

Following brief question and answer sessions at the end of each presentation, the young participants moved into five Workshop Groups. Although each group had a specific topic to discuss and had been given a number of questions or issues to consider, they were free to consider wider aspects if they wished. The outcome of their discussions – which became quite lively and heated in some groups – was summarised in short presentations in the plenary session at the end of the day. The workshop discussions were facilitated by young science communicators and the speakers all spent brief periods sitting in on them, listening and discussing with the young people.

### *Mobiles & Young People*

Issues for consideration by this group included: Whether we should be especially concerned about health risks? Where we need to control use of mobiles by young people – in schools, in the home, or in public places. Whether peer pressure is a problem and whether the mobile phone providers exploit the young?

In making its presentation, this group reported that it had identified a number of concerns. These included the health risks to and attitudes of the population as a whole; the need for Government action in providing both short- and long-term funding for independent research; the need for better access to information, and attention being drawn to safety information leaflets; and awareness raising within schools.

They believed that mobiles represented no immediate danger to young people, but that

awareness of the potential hazards should be raised. They expressed concerns about the potential risk of reducing the development of social skills in young people by excessive use of text messaging – given that this is the communication method predominantly used by this age group.

**"I bought a mobile phone because everyone else had one even though I knew I didn't need it."**

Among other issues discussed, they had spent some time on what they saw as exploitation of young people through the peer pressure which results from heavy marketing of phone covers, competitive branding among the phone



companies, personalising ring tones and of advertising through text messages.

They recognised that many regard mobile phones as a public nuisance and believe there should be further restrictions on their use in cars.

## Health Risks

How concerned should we be about radiation effects on health? Can we assess the risk? How sure do we have to be? Are there 'passive' risks to non-users? Do we need to protect the consumer (and if so, how?) – or are we in danger of hindering progress?

Issues of concern to this group were what they saw as the possible risk of cancer and DNA mutations, of memory loss and potential long-term, as yet unidentified or unknown, detrimental effects on health. They considered which sectors of society should be trusted in providing information about the real health risks and also discussed what should be done.

**“The health issue has never bothered me and I won't change that view until I see hard evidence to show me that they are dangerous.”**

With regard to trusting information sources, they were clear: Scientists – whom they regard as independent and “always telling the truth” – come out clear leaders, with the phone companies as definitely not to be trusted. They were equivocal about the trustworthiness of both the Government and the media.

In considering what should happen in the future, they suggested that text-only phones should be introduced for young people and that the costs of text messaging should be reduced still further, compared with voice messages. They believe that ‘cancer shields’ should be fitted to all phones and that the packaging should display clear information about the risks. They also advocate a minimum age of 14 years for use of mobile phones and that there should be more Government-funded research by independent scientists.

**“The most important thing for me is making more information available and I believe we should be teaching primary school children about mobile phones because many of them, even at that age, have one of their own.”**

In the meantime, this group's message on mobile phones is clear: **USE AT OWN RISK!**

## Phone Masts

This group tried to answer a number of questions: Is there a health implication from proximity to masts and, if so, can we assess the risk? Should there be more controls on mast siting in the future and what should be done about masts already in place? Finally, they were asked to consider whether the mobile phone companies are being irresponsible in their siting of the masts, or are they acting in the best interests of the technology?

On health, the group reported that they believe there are only minimal risks from the RF radiation itself, but that the stress from living in close proximity to masts – many of which have



“sprung up in back gardens overnight” – poses a considerable health risk. It is their view that more research should be done on the possible dangers from the masts and not just from the phones. It is the sometimes surprise nature of the arrival of a mast which engendered the strongest views. The group believes that there are not sufficient regulations at present, that Government legislation is required to ensure stricter planning control and that this should be applied, retrospectively, to the sites of existing masts.

The future, therefore, lies in research and education. There should be more research, by independent (“with no vested interest”) scientists, funded jointly by the Government and the phone companies. There should also be a campaign to educate the public, including young people, about the risks. This way, current perceptions might change for the better.

## Personal Safety

Lifeline or threat to life? – mobile phones are often marketed on the grounds that they can increase personal safety, but their use in some situations, hospitals for example, might endanger the life of others. This group considered these points and whether there should be more controls and, if so, how they could be enforced.

First they summarised the benefits they believe mobile phones can bring to personal safety. They give young people more independence, they make it easier to phone for lifts or taxis and also to get directions and avoid getting lost. In remote situations, the fact that the position of a mobile phone can be pinpointed to within 100m is seen as a positive advantage. They identified a number of places and situations in which they would feel safer with a mobile, including out hillwalking, walking at night, or in unfamiliar areas, and whether alone or in large crowds.

**“I thought at first I would only use it for emergencies but I ended up using it all the time. But it's a great way to keep in touch with friends and make arrangements for going out.”**

Then they looked at the disadvantages and possible dangers. They see an increased risk from muggers wanting to steal the phone and it was acknowledged that, although it can be used to summon help, a mobile cannot prevent an attack. They agreed that possession of a mobile can reduce risk awareness and increase recklessness about personal safety – in the city centre and on remote hillsides. They were also very aware of widespread misuse in making prank emergency and other calls and the dangers of use in hospitals, in cars and on aircraft.

They made some novel suggestions on controls. In hospitals, they suggested that there might be checkpoints where users are must be seen to switch off their phones, or even surrender them; or installing a special transmitter in the hospital which scrambles the phone's signal or switches it off. Airlines should have the power to remove the phone if it is not switched off, require cabin crew to collect the phones as passengers are boarding, or demand that it be placed in luggage in the hold.

They believe that public awareness of the hazards should be raised by including guidelines about inappropriate usage with the phone packaging, making the hazards more explicit in hospitals and on planes and running a widespread publicity campaign, funded by the phone companies. They suggested that the costs for implementing such measures could be raised by taxing the manufacturers – a rate of 10% of the cost to erect each mast – and by fines for improper use.



## Ethics & Sociological Issues

This group's discussions focused on rights and responsibilities, both of the individual and of society at large. The rights of users – in spite of in spite of potential health risks, and non-users – to privacy and freedom from possible 'passive' health effects. They also considered whether voluntary controls on usage are sufficient and how society's reliance on mobile phones is affecting behaviour.

The group discussed whether the Government had the right to impose restrictions on usage – for example, introducing time limits because of the health risks. They also discussed an individual's right to total control over what s/he does and, therefore, on how they use their phones. While recognising that restricting duration of phone use would reduce radiation exposure levels, they believed that new shields would have the same effect, as would increasing the use of hands-free kits.

For society at large, they believe that there should be stricter rules governing unsolicited advertising on mobile phones and stricter planning regulations, including community involvement, over the positioning of masts.



There should also be stricter guidelines on use in public places, on public transport and in schools – to reduce the public nuisance factor.

Use in schools should be banned, or reduced to emergencies only, not least to reduce the dangers of bullying. Individuals should have the right to say whether they want third parties to have access to their phone number, reducing unsolicited calls and messages.

It was recognised that many sectors of society can benefit from mobile phone technology – people can be reached at any time, the phone is handy for use in emergencies and business can be conducted from any location. On the other hand, the group decided that mobile phones can damage health, they can be annoying to other people and they are expensive to run.

## Attitudes & Knowledge

After the Working Group presentations, key findings from the analysis of the questionnaire were presented. Since the total cohort was only 46 senior secondary pupils from the West of Scotland and they were not selected to represent a particular segment of society, the results can hardly be described as definitive, but they do paint an interesting picture.

### Before:

- 91% use mobile phones (this compares with the 72% of their UK-wide peer group)
- 54% of them think phones are safe – but only one responded that s/he had 'no fears' about mobile phones
- cost was the overwhelming priority (67%) in phone selection – none reported having considered safety
- only 14% had read Government safety information
- 93% believe there should be tighter restrictions on siting of masts
- 86% would be worried if a mast were situated near their homes

### After:

The participants were asked to indicate, by show of hands, whether any of the views they expressed in completing the questionnaire earlier in the day would have changed as a result of what they had heard from the experts in the morning and learned during subsequent discussions.

- Roughly 10% said their views had changed
- 13% indicated that they would make greater use of text messaging



*"About 80% of the time I use it for text messages because calls are too expensive. But today's event was good because I learned many things, not least the danger posed by mobile phone masts."*

## Open to the floor

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Points stressed or made during the discussion included the sometimes frivolous use of mobile phones on Scotland's hills, the detrimental effects on the landscape of mobile phone masts and bullying by text message.

Another show of hands indicated that there is a high level of awareness of this last topic and also some experience of being on the receiving end of such activity.

**"There is a problem with text message bullying.... young people should be informed how to block unwanted messages."**

Discussion of how best to deal with it – since it is not confined to school hours – suggested that saving the messages (and originating numbers if available) as

'evidence' was valuable, as was barring calls from the originating number.

The young people believed the greatest danger to health comes from the masts, rather than from phone sets themselves. This was in spite of having earlier been told the contrary. They felt that more, but smaller (less powerful) base stations might be a socially acceptable way forward.

There was also discussion about the perceived independence of the academics who carry out some of the research into mobile phone safety and technology. It was pointed out that some of this research is funded by the phone companies and that had to call into question the 'independence' of the results.

In responding to some of the recommendations made by the young people, Sir William Stewart pointed out that the Report of the Expert Group's recommendation, that there be a safety leaflet distributed to every household in the UK, had been rejected on grounds of cost by the Government. A leaflet has been produced and distributed to all retailers and which is supposed to be issued with all purchases/exchanges/upgrades of mobile phones. Sir William recounted his own recent experience of the lack of efficacy of this system.

He also said a brief word in defence of the mobile phone companies when he told the audience that, while he appreciated the peer pressure they felt with regard to having the most up-to-date accessories for their phones, these accessories are usually not products of the phone companies themselves.

## The Future

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Almost all the young people present on the day owned, or had use of, a mobile phone. They were not reluctant to express their views – the strongest of which were about the siting of phone masts – perhaps *"in the back gardens of the phone company directors"*.

From these young people, the messages are clear. Information, Research and Legislation are needed.

- They want to know how the new phones will affect them.
- They want easier access to Government reports, research findings and safety information – through more readily available leaflets, awareness courses in schools and publicity campaigns.
- They believe the costs should be borne largely by the industry, but the health-related research must be 'independent'.
- They recognise that they are being exploited by the phone industry and want restrictions placed on how the companies target young people.
- They are also very concerned to control 'bullying by text message'.

# Contributors

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## Participants

*Bannerman High School, Glasgow*

Kirsty Lang  
Martin McGowan  
Fiona McQuade  
Pauline McLeman  
Susan Collins  
James Bell  
Lesley Burnside  
Leanne Logan  
Fiona Stewart

*Clydebank High School, West Dunbartonshire*

Chris Bankier  
Stuart Curran  
Michelle McIntosh  
David McVeigh  
Andrew Johnstone  
Nicholas Pistos

*Craigholme School, Glasgow*

Dawn Donaghy  
Jill McMaster  
Lauren McKnight  
Christa Leask  
Charlotte Mann  
Nicole Toppin  
Jennifer Anderson  
Jennifer Nicol  
Walvinder Aulak  
Ayesha Akhtar

*Jordanhill School, Glasgow*

Alistair Bell  
Thomas Downie  
Ellen Griffiths  
Matthew Inglis  
Jamie Jackson  
Scott MacLellan  
Matthew McNeill  
Ian Shields  
Patrick Sui

*Lenzie Academy, East Dunbartonshire*

Alanna Campbell  
Cara Darlington  
Dominic Martin  
Craig McNulty  
Andrew Rae  
Gary Miller  
Paul Meffin  
Angus MacDonald  
Alan Logan  
David Keellings  
Angus MacDonald

## Speakers

**Dr James Irvine**, Lecturer, Communications Division, Strathclyde University and academic coordinator for one of the work areas in the UK Mobile Virtual Centre for Excellence in Mobile & Personal Communications programme.

**Dr Richard Lerski**, Department of Medical Physics, Ninewells Hospital & Medical School and University of Dundee

**Mr John Fellows**, Glasgow Caledonian University and Lay Member of the Government's Independent Expert Group on Mobile Phones

## Chair

**Sir William Stewart, FRS, FRSE**

## Workshop group facilitators

Laura Gillies  
Neil Hadden  
John Rowell  
Fraser Scott  
Paul Welsh

## Conference Organisers

Liz Robertson, BA Regional Officer, North Scotland  
Fiona Selkirk, BA Regional Officer, Central & South Scotland  
Harinee Selvadurai, Education & Events Officer, Royal Society of Edinburgh

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University of Glasgow Media Services

The joint event formed part of the BA's programme of Visions Conferences, which seek the views of young people on how developments in science and technology should be applied in the future, and also of the RSE's programmes aiming to inspire and develop within our young people an interest in science, society and culture.

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The BA works throughout the UK to promote understanding and development of science, engineering and technology and to illuminate and enhance their contributions to cultural, economic and social life.

For membership information please contact the BA, FREEPOST, 22LON14913, London W1S 2EZ.  
Tel: 0870 241 0664 Fax: 0207 973 3066 E-mail: members@the-ba.net