

part of the Wessex Basin alone could yield up to 30 billion cubic feet (BCF) of shale gas. The very ancient Cambrian-age shale under the Midlands might yield another 300 BCF. Even the hard slates of parts of Wales and south west England might have gas in them.

But commercialisation of shale gas may not be so easy in

Britain and Europe. Fracking has recently had a bad press in the United States and there is no denying that drilling for shale gas is an energy-hungry business. Water for fracking is needed in large quantities and there is also the problem of disposing of water that flows back to the well and the drilling rig after the fracking is finished. This water

will be very dirty and need special treatment in tanks before it can be released into rivers or the sea.

At present the price of gas means that shale gas is only economic in the US. But for political reasons countries like Poland have their eye on shale gas as a possible secure source

allowing them some independence from Russian gas, and a way of generating electricity in a slightly cleaner way than burning coal. Britain has cheap gas from Qatar and Norway, but if Britain's shale gas resource is as big as the BGS thinks, it will be hard to ignore.

¹ <https://www.og.decc.gov.uk/upstream/licensing/shalegas.pdf>

THE MUSICAL BRAIN: IMPLICATIONS FOR EDUCATION AND BEYOND



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The APPG on Scientific Research in Learning and Education explores issues at the interface between scientific research and education and few issues fit this remit more so than music, which has been the focus of a recent government review. As such the effects of music were considered by the APPG at a meeting chaired by Baroness Morris and Prof Coen of King's College London, a musician and neuroscientist. The meeting first heard from Prof Philip Sheppard of the Royal Academy of Music. Prof Sheppard outlined the extent of the impact music has on our

lives, acknowledging its role in culture and bonding. He cites the example of nursery rhymes, which exist in all cultures, and carry a message about attempting something, failing and trying again – a primal message that is important to communicate to children. He also suggests that certain features of music such as inflection and gesture are critical to higher order communication. He explained how music can be beneficial to learning, citing the example of singing being used to assist learning lengthy material such as the Quran or periodic table. He suggested that there is a level of deep learning that occurs when individuals create music that is not present when you merely repeat what others have created. This creation also helps develop a sense of self and ownership and has strong implications for how we teach music.

Following Prof Sheppard, Dr Lauren Scott, a neuroscientist at Goldsmiths, University of London, outlined the impact music has on the brain. She

explained that the brain changes throughout life in response to experiences and learning and that music can be considered a super skill. Unpicking this super skill she stated that music involves a number of different elements including the ability to plan and execute complex movement sequences as well as integrating information across the senses as one reads visual symbols and uses them to create a movement. She provided evidence detailing how the brains of musicians differ, showing enlargements of areas responsible for movement and touch processing as well as alterations to the regions involved in hearing. She states that one area often underestimated is expertise as listeners and how individuals can be educated to hear certain types of music as the brain learns what to listen to and effectively ensures that information is then heard. She outlined current research looking into musicality and what facets are associated with it. Although the research is ongoing, she

suspects that not all facets will require formal musical training. From Dr Scott's presentation then, one could conclude that musicality in some form can be found in a large proportion of individuals, including those who have not received music training and that as well as education providing an opportunity to create music; it should consider teaching how to listen to music.

Finally Prof Susan Hallam from the Institute of Education spoke about the wider impact of music. She began with a note of caution that music is so much a part of our lives and so accessible that it is at risk of being taken for granted. She provided evidence of music improving social and personal development as well as language and therefore literacy, physical and intellectual development and attainment. For example, she cited music improving fine movements and therefore improving writing. She reported findings from the "In Harmony" project which demonstrated that music training can result in increased



performance on English and Maths SATs, even when the children have had less time studying these core subjects due to increased time spent on music education. She suggests that music can improve mood, wellbeing and measures such as attention and concentration and that these benefits occur across the whole lifespan.

All speakers were emphatic that music education is critical and that the benefits transfer across the entire curriculum and beyond education. The discussion that followed included debate on the best type of music to start with, accessibility of music to those of lower socioeconomic status and whether group or individual

lessons were optimal. Although a number of factors were considered, the general consensus was that beginning with the voice through singing was a sensible choice and that group training was useful, although individual lessons may be necessary as well to achieve particular levels of proficiency. It was clear that music should not

be taken for granted and that as education changes, losing sight of music would be a mistake that impacts on development beyond the curriculum.

TIME FOR ACTION ON E-WASTE



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In August 2008 the New York Times described e-waste as “the world’s fastest growing and potentially most dangerous waste problem”. Yet despite continued criticism over its poor record on tackling the problem the UK Government has been slow to respond to the urgent need to stem the illegal exports of waste electronic equipment to the developing world.

The UK is currently responsible for illegally exporting around 23,000 tonnes of computers alone to Africa each year, the problem has yet to rise far enough up the political agenda to merit serious attention. This means that the UK remains in violation of the Basel Convention, and it is now in violation of a 2009 amendment to the European Waste Shipment Regulation, which effectively brought the Basle Convention into law.

A high profile investigation by the Independent, Sky News and Greenpeace in 2009, highlighted how the public sector remains a source of e-waste that evades customs by being labelled for 're-use' by tagging a TV disposed of at a municipal waste facility in Hampshire and tracking it to Africa. Whilst several recent prosecutions by the Environment Agency have begun to raise the profile of the issue, these merely represent the tip of the iceberg. Both the EA and its Scottish equivalent SEPA provide registers of approved recyclers and exporters but, as is the case with the stretched resources of environmental lobby groups, the sheer scale of the problem and its lack of visibility demonstrate the need for a dedicated

organisation. Furthermore, as cowboy operations can undercut the costs of responsible recyclers this lack of support is also hindering the growth of the UK’s e-waste recycling industry. Yet given the current economic climate the case for making the relatively small investment that would be needed to provide a significant boost to a mature and profitable industry can be made on economic grounds alone.

In the US, the Basel Action Network administers the e-Stewards initiative (see www.e-stewards.org) and is now expanding it overseas. E-Stewards is a third-party audited accreditation programme that provides certification for responsible recyclers that ensure that no e-waste is dumped in landfills or incinerators, exported to developing countries or sent to prison labour operations, and ensure no release of private data from waste devices. E-Stewards was so popular with industry that it was over-subscribed even in its pilot year. BAN has been able to make this progress due to the backing of leading recyclers in North America, and because it is able to focus solely on tackling the problem.

In response to these needs in Sept 2009 the Photonics and Plastic Electronics and Resource Efficiency Network Knowledge Transfer Networks backed and published my call for a new independent, industry-led organisation to provide the following:

- Easily accessible and informed advice on e-waste
- Awareness-raising through targeted advice to the public and private sectors, and to consumers
- A platform for lobbying to end the UK’s illegal exports of e-waste
- An independent, industry-backed registration system for responsible recyclers, based on e-Stewards

Since then little has changed and the call remains a live document. However, given the continued economic downturn and the significant potential for growth in the UK’s e-waste recycling industry, let alone the environmental benefits this would bring, there are now more reasons than ever for the UK Government to support this call.