

Millennium science centres and life sciences education

Leigh Fish

Where can the public go to be educated about biological science? Leigh Fish describes the current Science Centre Scene.

The next generation of science centres is opening across the UK offering exciting learning opportunities in microbiology, biotechnology and genetics. These new centres aim to enthuse and motivate visitors about science and technology through exhibitions, science shows, information technology (IT) facilities, Imax cinemas and more traditional practicals and workshops. The unique combination of learning formats and trained science communicators in these inspiring environments is already proving popular with a wide range of audiences.

The National Lottery's Millennium Commission, the Wellcome Trust and public and private sector funding partnerships bequeathed the network of new science centres. These have built on best practice from established centres like the Exploratory (now replaced by At-Bristol), Techniquet in Cardiff and the Science Museum's Launch Pad (London). They are acting as hub organizations and forging links with universities, industry, learned societies and research funders and are working towards some of the targets expressed in the Science and Society House of Lords Select Committee report. Science centres target members of the public and community groups, pre-school children, schools and colleges, further and higher education establishments offering post-16 vocational and non-vocational courses, and life-long learners. They offer carefully

designed programmes using exhibitions, laboratories, classrooms and discovery environments and it is in these venues that both formal and informal learning are flourishing.

There are currently 51 science centres listed by the British Interactive Group, so it should not be hard to find a science centre near you – many are also offering outreach activities and in-service education training (INSET) for teachers. Each centre is different, with distinct foci on the areas of science covered, although these often include the life sciences. The Wellcome Trust has played a major role in funding seven of the new centres and it is these facilities that feature most biotechnology, microbiology and genetics. Of the centres not already open, most will be complete in early summer (Birmingham Thinktank follows in late September), with pilot programmes already offered by many to educational groups and the public.

Of the many and varied programmes on offer, micro-organisms are specifically explored by At-Bristol and Life Interactive World, with Glasgow Science Centre planning to offer real time gold-coating and scanning electron microscopy of samples when they open fully in the summer. Techniquet in Cardiff, one of the long established science centres, excels at providing microbiology workshops in partnership with the local Public Health Laboratory Service where visitors aim to find the source of food poisoning at a wedding.

Biotechnology is also represented with a plant power game show (audience participation obligatory!) and Science and Plants for Schools (SAPS) protocols.

Genetics workshops on offer not only explore chromosomes, nature/nurture and evolution, but also feature practical activities, often using protocols from the National Centre for Biotechnology Education (NCBE) at Reading. These include solving a crime using a 'suspect's' DNA and restriction enzymes, simulated 'pre-natal screening of embryos' using the same techniques, or extracting DNA from plant tissues. Life Interactive World is closely linked with the research genetics centre of the

Table 1. Selected science centres (referred to in this article)

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| ■ At-Bristol Harbourside, Bristol BS1 5DB | Tel. 0117 915 5000; Fax 0117 915 7200 email information@at-bristol.org.uk www.at-bristol.org.uk |
| ■ Glasgow Science Centre 50 Pacific Quay, Glasgow G51 1EA | Tel. 0141 420 5010; Fax 0141 420 5011 email admin@gsc.org.uk www.gsc.org.uk |
| ■ Life Interactive World Times Square, Newcastle upon Tyne NE1 4EP | Tel. 0191 243 8223; Fax 0191 243 8201 email general@centreforlife.co.uk www.lifeinteractiveworld.co.uk |
| ■ Thinktank (Birmingham's Museum of Science and Discovery) 144 Newhall Street, Birmingham B3 1RZ (correspondence only) | Tel. 0121 303 2983; Fax 0121 303 1315 email enquiries@discovery.org.uk www.discoverycentre.org.uk |
| ■ Manchester Museum of Science and Industry University of Manchester, Oxford Road, Manchester M13 9PL | Tel. 0161 275 2634; Fax 0161 275 2676 email anna.j.davey@man.ac.uk www.museum.man.ac.uk |
| ■ Science Museum Exhibition Road, London SW7 2DD | Tel. 0870 870 4771; Fax 0207 942 4302 email sciencemuseum@nmsi.ac.uk www.sciencemuseum.org.uk |
| ■ Sensation Greenmarket, Dundee DD1 4QB | Tel. 01382 228 800; Fax 01382 868 602 email alice.hague@sensation.org.uk www.sensation.org.uk |
| ■ Techniquet Stuart Street, Cardiff CF1 6BW | Tel. 029 20 475 475; Fax 029 20 482 517 email gen@techniquet.org www.techniquet.org |



Science Centre features a multimedia theatre and virtual science theatre powered by a powerful Silicon Graphics computer which allows data from microscopy and medical imaging technologies like magnetic resonance imaging, ultrasound and the 'visible human' project to be explored in real time interactively. The running of educational programmes specifically designed for these new media (Glasgow houses the only other theatre outside Japan) allows in-depth exploration and coverage specifically

LEFT:
Visitors photocopy their DNA using PCR at the Manchester Museum, University of Manchester.
COURTESY SUSAN BULLEID AND THE MANCHESTER MUSEUM, UNIVERSITY OF MANCHESTER

nearby University of Newcastle and its programmes strongly feature genetics, including DNA subspecies identification and 'genetic engineering for beginners' with transformation of cells. The polymerase chain reaction (PCR) is used at Techniquest, At-Bristol, Glasgow Science Centre, Life Interactive World and the Manchester Museum of Science and Industry to amplify mitochondrial DNA from cheek cells and show the power of this technique in detection and diagnosis.

In addition to the basic skills learned by participants in these programmes (developing observation, considering evidence and drawing conclusions) the activities are extended to use real scientific techniques and are often linked to the ethics involved in applying that science. In considering the use of PCR to detect genetically modified crops, hepatitis C contaminated blood or foot-and-mouth disease, visitors achieve a greater understanding of the type of work scientists do and are more able to examine and understand some of the ethical implications. Debates at Glasgow Science Centre, At-Bristol and Birmingham Thinktank encourage visitors to draw their own conclusions and to be more confident in interpreting newspaper articles and TV programmes.

At many of the new centres, the exhibitions feature current hot topics in science and canvass the opinions and views of visitors. The education programmes are closely tied in with the exhibitions, each reinforcing messages and content in the other. Although most of the centres have laboratories and classrooms, several of the larger institutions have brought together diverse tools to assist with their communication aims and have linked these to the education programmes. Increasingly, planetaria are being used as 360 degree projection spaces and feature journeys through the body as well as star fields. Glasgow

tailored to the needs of each educational group.

Many of the new centres are equipped with IT facilities which allow visitor-focussed research and learning, in addition to offering training in computing skills and acting as a showcase for software. IT will increasingly be used for video conferencing and debating, to allow visitor opinions and views to be shared nationwide and for combined multimedia presentations across the centres – visits by real scientists will be shared by science centres, giving more effective use of scientists' time and a bigger audience.

Science centres have the potential to bring science closer to its public and these are truly interesting times.

● *Dr Leigh Fish worked as content manager on the Get Connected! Gallery for At-Bristol before moving on to Glasgow Science Centre where he is currently a staff scientist involved in the ongoing operations of laboratories and IT suites. He can be contacted at Glasgow Science Centre, 50 Pacific Quay, Glasgow. G51 1EA. Tel. 0141 420 5010; Fax 0141 420 5011 email leigh.fish@gsc.org.uk*

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Further reading

British Interactive Group
list of UK science centres:
<http://www.big.uk.com/centres/index.htm>

House of Lords Select Committee
3rd Report full text:
<http://www.parliament.the-stationery-office.co.uk/pa/ld199900/ldselect/ldscstech/38/3801.htm>

Also available from HMSO:
House of Lords Select Committee
3rd Report HL38 (14 March 2000); ISBN 0 10 403800 4.