

A vision for Science and Society

Response to Government

by Ecsite-uk,

Representing the UK's Science and Discovery Centres

October 17 2008

Forward

In considering our response to this consultation, Ecsite-uk has worked closely during the consultation period with a broad group of partners from the UK science engagement community. We share many common views on both the nature of our vision and on the development of Government strategy. We are committed to working together beyond the consultation period, in collaboration with Government, to more effectively achieve our common goals. Ecsite-uk welcomes this Government consultation and the strategic discussions it has initiated and in particular this area is being given the profile it deserves.

The UK's Science and Discovery Centres

The Science and Discovery centres represented by Ecsite-uk offer the only UK-wide network with a year-round publically accessible infrastructure dedicated to inspiring and engaging people of all ages and all backgrounds with science. Indeed, the vast majority of UK Science & Discovery centres have been created with this as their explicit mission and primary purpose.

All the UK's Science & Discovery centres work in close partnership with Universities, Industry, Schools, and the General Public. Uniquely, they act as hubs where year-round people from all these four sectors come together to share experiences and gain a deeper understanding of the role each plays in wider society.

As one of the few networks with publically accessible spaces, the UK Science & Discovery centres work in strong partnership with the vast majority of the nation's other science engagement organisations (for the purposes of this document we will use the word science to mean all STEM subjects). For example, four of the six Beacons have Science & Discovery centres as a major partner, bringing expertise as well as the venue where researchers, schools and the public come together. A number of the Science & Discovery centres have been awarded three-year STEMPOINT contracts by STEMNET, almost every centre runs events with their audiences as part of The BA National Science and Engineering Week and many centres are central to their own city science festivals. In addition many work in partnership with the research councils to train scientists in engagement and to showcase their scientists' work in specific areas (for example STFC's Science Centre Scheme makes small funds available for inspirational projects which promote STFC science and technology to Science & Discovery centres audiences).

Our 50 member centres attract 19.5 million visitors each year and are based in all parts of the UK, rural and urban. Since these publicly accessible spaces are already trusted by, and embedded within, their local communities, they provide a major opportunity for inspiring, engaging and exciting people across the UK with Science.

56% of our visitors are female. Two-third of our visitors learn and explore with their families making the Science & Discovery centres leading providers of experiential family learning in the field of science. Our centres also of course run tens of thousands of individual schools learning events, programmes and workshops each year targeted at specific Key Stages or sectors of the community, many of which are traditionally hard-to-reach audiences.

Our vision: A shared ownership of science

Relationships develop over time, through a shared knowledge and understanding of one another and a gradual development of trust in each partner. With openness and integrity on both sides, the trust deepens and the relationship is allowed to strengthen. The relationship of science with society is no different from this.

Fifteen years ago the received wisdom was to assume a lack of scientific knowledge in the public that needed to be filled. We have of course made great advances from this position, and 'Public Understanding of Science' gave way to 'public communication' and thence to 'public engagement', with dialogue and experiential learning at its core.

We should now aim higher and look towards a 'Shared Ownership of Science'.

By this we mean a society that is happy to discuss science, empowered to share opinions on it, has the self-confidence and mechanisms to challenge elements they are uneasy of and is confident that their voice will be listened to; a society that contributes to, and thus shares ownership of, the difficult ethical decisions that will increasingly arise as a consequence of scientific advances and global changes; a society that has faith in both scientists and their governance, and trusts that when decisions are made, they are open to scrutiny, transparent, and endeavour to be in the best interests of our broader society.

In our vision for a shared ownership of science we give support to The Secretary of State John Denham in his progressive views articulated last year:

"Our ambition should be to go further than scientific literacy – to a more mature relationship between the public, the media, and scientists, where everyone understands each other. In particular, it means the public and the media maintaining the same healthy scepticism that they do towards other information they consume. Not taking the scientists' conclusions for granted, but questioning what the real implications of the evidence should be."

Achieving this vision ultimately depends on bringing the public of all ages and backgrounds into regular open and honest conversation with scientists, policy makers and industrial experts in a host of different ways, through events, family activities, media, dialogue opportunities, schools workshops, exhibitions, projects and festivals.

We thoroughly welcome the vision and central goals contained within the Government consultation document. However, whilst we absolutely agree that we want a society excited by science, this is not enough. We would also like to strive for a society with a deeper, more mature relationship with science – A society with a sense of ownership of the science they fund and the decisions that must be made.

Specific recommendations

'What contribution can Science Centres make to the Science and Society Agenda?' Qu 4.13

The consultation document asks specifically how Science and Discovery centres can contribute to the Government Science & Society strategy (Qu 4.13). We believe the UK's Science and Discovery centres represent an enormous opportunity for the future of science in the UK. As such our centres are keen to play a fundamental role in the delivery of the UK Government's ambitious Science and Society aspirations.

1. Independent and Trusted

One of the unique factors of Science & Discovery centres across the UK is that they are trusted within their communities to be independent in their outlook and the stories they tell. They are perceived as educational providers who, whilst celebrating science and providing inspirational and motivational opportunities, are entirely independent of the voice of Government and un-swayed by the interests of industry. It is key that this independence, and in particular editorial control, is retained by the Science & Discovery centres to preserve this trusted status.

Science & Discovery centres work hard to protect their intellectual independence and never more so when funded by an industry that may be involved in what could be considered as controversial activities (eg the alcohol, pharmaceutical or nuclear industries). In these instances, centres would be likely to shape a project around dialogue and debate of the most contentious issues and would not consider simply putting forward the funder's viewpoint. Science & Discovery centres are keen to partner with Government, raising debate and encouraging people from all backgrounds to contribute. However, we should be clear at this point that our strength lies in our independence and the ability for us to share the science with visitors so that they might make up their own minds.

2. A UK network of publicly accessible spaces: Hubs for public engagement

As mentioned in the introduction to this response, the Science & Discovery centres represent the only UK-wide network of publicly accessible spaces whose primary goal is to inspire, engage and excite people from all backgrounds with the wonders and implications of science. We bring together schools, teachers, families and adults with university scientists and scientific entrepreneurs and engineers, pharmaceutical and other industrial partners. We are thus one of the few venues where bringing these sectors together in an impartial setting is a fundamental part of our mission.

This offers a huge, unique and comparatively untapped opportunity in terms of creating a national strategy for Science & Society, with Government supporting Science & Discovery centres to act as **hubs**, offering our own events and activities as well as venues for partnerships with our colleagues working towards the Science & Society agenda.

Having a UK-wide network of publically accessible spaces, neutral in their affiliations, welcoming and non-threatening to people from all educational levels clearly represents a huge opportunity. However there is a cost. The overheads involved in running these inspirational learning spaces, exhibitions and laboratories that encourage people to learn and engage with science in new, fun ways are clearly

more costly than an operation that has no public spaces and shares ours when they need. By Government supporting the Science & Discovery centres as hubs for Public Engagement working in close partnerships with the other many great science engagement organisations and initiatives we could reach a level of UK-wide coherence. Equally using these centres as outreach hubs for harder-to-reach audiences, could ensure these astonishing and inspirational activities could be accessed by those in rural and remote areas as well as those in metropolitan areas.

3. Thousands of professional staff in place, dedicated to engaging the public with science

Within the Ecsite-uk membership, there are over 50 Science & Discovery Centres (and 20 affiliated members eg the Royal Society, the Royal Institution, the Institute of Physics). The 50 centres have between them an army of thousands of staff, expert in engaging the public with science and in providing innovative motivational and inspirational science learning experiences for children, adults and families. The centres are trusted by their communities, with established links to local schools, other STEM providers and regional Universities and industry. The restriction on the number of people who take part in their public engagement activities and family science learning opportunities is largely a matter of funding.

4. Already used by thousands of teachers and millions of students

Thousands of teachers choose to bring millions of students to Science & Discovery centres each year because they are confident that the high quality science learning offered by an out of school setting extends and complements what students can learn in class. They are also clear about the opportunities such visits offer in terms of affective changes within their students. Given the current difficulties they face bringing students out of the classroom (in terms of additional work, Health and Safety and funding for all out-of-school visits) we offer this as a measure of the high value they place on the experiences offered by Science & Discovery centres.

5. Reaching out ...

Finally there is a major role for Science & Discovery centres and others within the science engagement community in outreach - enabling schools and community groups to experience often pivotal, high quality inspirational and motivational science activities where they are. Many of our centres run outreach programmes providing informal inspirational science activities in remote parts of the UK. These are highly valued by teachers and pupils alike (as evidenced by the recent DIUS – DCSF Science Centre Enrichment Activity Grants), although generally these schemes must be funded by specific grants. Should funding be available, the network would be pleased to deliver.

6. Instigating change & tackling major issues

Over the next decade, every one of us in the UK will need to make some fundamental changes in the way we live in order to reduce the carbon footprint of our society. Many Science & Discovery Centres already run projects and exhibitions promoting dialogue in this area. As a national network, the UK Science & Discovery Centres would be keen to work with Government to see how our 50 centres might help the public to explore the evidence and issues, to examine what is at stake and make up their own minds relating to instigating changes in their own businesses, lives and communities.

In a similar vein, as a nation we face some tough choices, for example a potential move towards nuclear energy. Society need to be part of these discussions from the outset, be fully informed, be able to participate in the debate and feel a partial ownership of the decisions made.

Most centres across the UK already run activities and exhibitions on the human body and are ideally placed to inspire people to explore the issues related to their own health, and how they might choose to live more healthily. As a national network, we would be keen to develop national programmes that have an impact related to personal choice, the human body, obesity, healthy living and healthy ageing.

Aspirations:

1. An 'Inspirational Science Experience' for every UK child

We believe it should be a Government aspiration to give every school child in the UK the opportunity to be part of a high quality, affective, out-of-the-classroom '**Inspirational Science Experience**' at least once each school year. We would urge Government to partner with Science & Discovery centres and other innovative science engagement colleagues to enable these motivational and potentially pivotal experiences to be accessible to all children, regardless of wealth.

2. The Opportunity for every Adult to engage with the issues

Further, we believe that it should be a Government aspiration that every adult in the UK is given the opportunity to engage with the major science-based issues of the day in a more affective in-depth manner, and that every adult has access (both physically and cognitively) to contribute to Government public consultations and other debates should they wish.

Learning Outside the Classroom

We strongly endorse the DCMS initiative 'Learning Outside the Classroom' and would like to see a greater inter-relationship between this excellent initiative and the DIUS strategy. Evidence shows that both children and teachers can be inspired and motivated in out-of-school learning settings, and that these experiences can be pivotal and subsequent attitudinal changes may persist for many years. In addition, the new informal setting away from school can often liberate less-engaged students to behave in a more considered manner and discover an interest in a subject they had previously ignored or actively dismissed.

Our goal is to inspire and involve students so they embrace science. We of course fully support all opportunities that have the potential to engender such affective change, including science festivals, nature parks, theatres and other programmes as well as all the opportunities within Science and Discovery centres.

Frequently the cost of coach travel to these new motivational science experiences are prohibitive (and often twice the cost of the entry fee for each student). The transport costs are likely to increase over coming years so we urge Government to

consider new options to enable UK students from all backgrounds and in rural as well as urban schools to have access to the variety of rich motivational experiences available to them outside the classroom.

We would urge Government within this Science & Society strategy to further support these activities by:

1. Taking advantage of this scheme to work with teachers giving them the confidence and skills necessary to embrace Out of School learning.
2. Exploring ways of supporting all schools to bring students into inspirational informal science learning environments (visits to Science & Discovery centres, science festivals, science theatre, science exhibitions etc), for example by setting up posts for school science visit coordinators in all primary and secondary schools (whether voluntary or paid).
3. Examining innovative ways in which students have the opportunity to take part in supplementary inspirational learning activities with their families thus engaging a broader range of society (for example a Government-backed scheme whereby students who visit a Science & Discovery Centre or science festival can return at the weekend with their families for free).
4. Looking for opportunities to ensure that travel to and from Out-of-school science learning opportunities is not only the preserve of the wealthier schools.

Science and the Arts

Science & Discovery centres work through a variety of media to inspire and engage our richly diverse population with science, technology, engineering and maths. Centres frequently work in partnership with theatre companies to create science-based theatre delving into the ethical issues. Science & Discovery centres, science festivals and some others also frequently host such theatre performances as well as art-based installations and exhibitions as a means to appeal to a wider audience. This approach should be encouraged in all forms (including within schools) and supported by Government through other departments if we are to bring science to a wider public and demonstrate how Science is truly embedded in every facet of Society.

Co-ordinating the UK's Science & Society Activity

The Consultation document specifically asks:

- What steps can we take to co-ordinate or better streamline Science and Society activity?
- How should we measure progress?
- How should we measure success?

The development of a 'Science & Society Programme'

We, along with our colleagues and partners in other Science & Society organisations, propose the development of a 'Science & Society Programme' analogous to the STEM Programme which has achieved great successes in working towards coherence within the science education sector.

The goal of this new Science & Society Programme would be to bring together (and map) the UK-wide activities that fall under the Science & Society banner, ensuring the sharing of ideas, knowledge and best practice so that we might work towards our common goals in a co-ordinated and coherent manner. Whilst this is something we would want to partner with Government on, we feel that drawing together a National Science & Society Programme is best achieved through Government support of a collaborative group from within the Science & Society community.

Other recommendations

Initial discussions with colleagues in the Science & Society community (organisations are listed at the end of this document) have revealed five areas we feel should be explored further between us, potentially as workstreams supported by DIUS. These are elaborated on below.

1. Raising Quality through professional training

This workstream would look strategically at the CPD needs of the Science & Society sector, in particular CPD of dialogue and science engagement professionals at all levels and in all institutions. It would also examine a process and framework by which CPD and the sharing of best practice (including the work by volunteers) would be supported and accredited across the whole sector for the future.

A second element of this workstream would be to explore the provision of science engagement and dialogue training available to scientists of all levels and all subject specialisms across the UK. Ecsite-uk and our members already provide some scientist training programmes funded by Research Councils (and others) opening up opportunities for scientists to work with the public. However, we would welcome a broader UK-wide strategic vision for this training. We are hugely supportive of the role of the Beacons and would be delighted to see Universities being urged by DIUS to include a module around the subject area of 'Scientific research: Ethics and responsibilities to the wider public', as a natural part of all UK science courses.

2. Measuring Impact, Progress and Success

Across the Science & Society sector both within the UK and abroad, measuring impact and finding accurate, comparable indicators of quality and success is a major challenge. Ecsite-uk has some experience in this area having consulted stakeholders

worldwide for the publication of the DIUS-DCSF-backed *'Inspiration, Engagement & Learning: The value of the Science & Discovery Centres in the UK'* and the *'Impact of Science & Discovery centres worldwide'* published in April 2008.

Following this research, Ecsite-uk now encourages the use of the MLA 'Inspiring Learning for All' framework with the 19.5 million visitors to the UK's 50 Science & Discovery centres. Whilst this measures the affective as well as cognitive impact of science engagement programmes, events and exhibitions, we would be keen to work collaboratively to improve on this, creating a robust, meaningful and pragmatic framework we can all embrace.

The USA has recently examined a similar system to the ILA framework from which we might learn and there is untapped expertise within University education departments, social science departments, museum studies groups and science learning establishments in the UK and across Europe. In addition, clearly the impact goes wider than the individual and we would like to combine this evaluation with a robust measure of societal and economic impact, both short-term and long-term. There will also be lessons to learn from the Tavistock report and the new methodology employed by consultants undertaking the Government's independent research into the impact of Science & Discovery Centres, due to report in early 2009.

3. Dialogue Activities and Public Consultations

Dialogue activities are a staple of Science & Discovery centres, particularly offered to schools as part of the science or citizenship courses to encourage the exploration of contentious science-based issues. We are keen to work with others supported by Government to explore how to develop our activities further with a wider range of age groups and a wider range of social science and arts (eg drama) expertise. Frequently our dialogue activities focus on developments in bioscience and are funded by The Wellcome Trust who are recognised leaders in this field and majors supporters of work in this area.

Emanating from this we would like to explore how the Science & Society partners, in collaboration with the 50 Science & Discovery centres, might be used to explore and capture public opinion in formal Government consultations. It is clear that people wish to be consulted (RCUK/DIUS Public Attitudes report, 2008) but not clear how this might happen on a National Scale. Our work shows that if true consultation is what is required, the public of all ages are keen to help and we should use this as a huge opportunity for engagement and building trust between Science & Society.

This 'Dialogue' workstream would aim to explore a National independent mechanism, run by the Science & Society partners and supported by Government to enable public consultations around contentious issues on a national scale.

4. Science as a Creative and Cultural Pursuit

Culture is barely mentioned in this document, yet science is clearly a fundamental part of UK culture. Not only are our communities and cities in the UK quite literally built through science, but the methods by which we choose to communicate, to travel, to live and to eat are entirely dependant on scientific innovation. However to suggest that science is simply a utilitarian pursuit with no affective qualities is to vastly underestimate its beauty and artfulness. It entirely misses the creativity,

courage, sharing of ideas and thoughts, curiosity and delight that science encompasses.

We would urge DIUS to work with DCMS to ensure that inspirational, motivational and experiential science activities are part of the 5-hours of culture offered to every child. Further, we welcome the decision by DCMS to appoint a Chief Scientific Advisor following the 2007 report by Dr Michael Dixon. We are optimistic that she will champion science and ensure that science is not forgotten again within the cultural agenda, as has been the case with the Cultural Olympiad. Finally, we would refer here to the findings of Sir Brian McMaster in his review on the funding of cultural institutions and hope that some lessons might be learned to influence our own field.

5. Building on existing networks

The UK has an international reputation in science engagement and there is a real willingness within the UK science engagement community to work together. We are also of course keen to learn from those in associated UK fields and our colleagues overseas (we, and others, are part of Pan-European and worldwide networks).

Ecsite-uk and the 50 Science & Discovery centres we represent welcome the opportunity to work more closely with other National networks, exploiting the strengths we can bring to one another, particularly in the uncertain economic times ahead. Whilst our members already partner with many of the members of other national networks we would like to see an ever-growing strategic relationship with the Beacons, STEMNET, National Science and Engineering Week, Science Festivals and Science Learning Centres amongst others.

We would urge DIUS to continue their critical support for the relatively small umbrella organisations who coordinate large numbers of institutions across the UK. Ecsite-uk is one such organisation which encourages excellence and innovation in informal science learning by serving and linking its member centres and advancing their common goals. The National Co-ordinating Centre for the Beacons, National Science and Engineering week and the National Science Learning centres are of course others.

Other Recommendations:

Cross-departmental work

Science & Discovery centres work in a variety of areas that cross Government departments. For example we are a major provider of learning for children, schools and families (DCSF), a number of our members are museums (DCMS), many centres offer health and body-related exhibitions and programmes (DH) and the Science & Discovery centres deliver to many of the strategic goals of DIUS and are of course within the DIUS portfolio.

We would urge Government to continue to consider Science & Society from a cross-departmental standpoint, taking the best knowledge, ideas and views from each department.

Informal to formal learning: Sharing the expertise

The Science and Discovery centres of the UK are already delivering pivotal, inspirational science learning experiences to people of all ages, and all backgrounds, in all parts of the country, through both in-reach and outreach, and often through the use of interactives and specialist equipment. The learning they provide is largely experiential and within the affective as well as cognitive domains, giving people the opportunity to experiment, test, explore and discover the delights of science for themselves.

We would like to see a mechanism whereby the experience and knowledge practiced daily in the UK's Science & Discovery centres is exploited and utilised by schools ensuring that millions of children have access to these types of hands-on interactive experiences. We would further like to see a mechanism by which the learning within the wider informal science engagement sector is channelled into the formal learning environment as a matter of good practice. There are a variety of ways of making this possible given the support of Government.

Encouraging Change within Universities

If Government considers it important that scientists engage with the public, they must give a clear, unambiguous message to Universities via the funding and assessment mechanisms. Currently this is lacking.

We welcome the creation of the Beacons for Public Engagement and champion the work they embark upon to change the culture within the UK's Universities. However, if Government would really like to see change in this area we urge them to:

1. Ensure that public engagement is recognised and rewarded as part of the RAE/Research Excellence Framework.
2. Ensure that a proportion of funding is formally ring-fenced for Public engagement activities.
3. Ensure that University Scientists and researchers know where to find expertise in public engagement within their University and in the wider Science & Society community.

Clearly the way these changes are implemented would be fundamental to their success particularly because not every researcher chooses, nor indeed is suited, to engaging the public with their research. However there are number of opportunities through collaborative engagement activities within and between University departments, and through partnerships with Science & Discovery centres, local media, STEMNET and many other Science & Society providers that would help researchers embrace and (even) enjoy these changes.

If it is the belief of Government that scientists and Universities have a responsibility to share their work with wider society, then this message should come clearly from Government within this Science & Society Strategy. Ecsite-uk and 50 Science & Discovery Centres would fully support this message.

Appendix

Collaborating with our Peers

We are committed to working collaboratively across the sector and with DIUS to help deliver our common goals, and welcome discussions following the consultation period. In preparation of our response, Ecsite-uk met with the following organisations, at the invitation of the BA, to share views and to seek to generate a shared way forward:

Beacons for Public Engagement
British Association for the Advancement of Science
Ecsite-uk
Research Councils UK
Royal Academy of Engineering
Royal Institution
Royal Society
Science Museum
STEMNET
Wellcome Trust