

HAVE SOMETHING TO SAY?
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LETTERS

RESPONSES TO 'RESEARCH WITH IMPACT'

The Research Councils are indebted to Peter Warry for his work in identifying how we can increase the economic impact of our investments and expressing it so succinctly. Warry rightly points out ('Research with Impact,' *Ingenia* 29) that Councils are starting from a position of strength with many of the necessary strategies, policies and resources already in place. We accept, however, that more needs to be done and we will be devoting extra resources to deliver a new programme of activities (see www.rcuk.ac.uk/innovation). As a starting point, my fellow chief executives invited me to lead the agenda for knowledge transfer and economic impact across all the Councils and to chair a cross-Council group to take forward the recommendations.

We will use the influence referred to by Peter Warry, to extend our links with users of research from both private and public sectors and bring them together, through a new high-

level strategic forum. The forum will involve universities and other national research institutions, intermediary and knowledge brokering organisations (such as the Regional Development Agencies and the Devolved Administrations) and public funders of research and training (including the Funding Councils and the Technology Strategy Board).

We recognise that our world-class researchers are the most valuable resource we have. Our activities will ensure that they have the skills and environment they need to exploit their research and we will promote research collaborations and exchanges between users and research organisations. Researchers are well placed to identify the potential outcomes of research and we have consulted with higher education institutions on how the peer review system could be deployed to this end and are currently analysing the responses.

We agree that we need to demonstrate the success of our activities. There are two sides to this. The first is to ensure that we are telling the stories. We have a public duty to explain how our funding delivers benefit. We do this already, but know there is more we can do. The second is that we have the data that gives us (and central government) the confidence to know that what we are doing is working. This is a challenge that faces research funders the world over. We will be commissioning a major new study to ensure that we use the best available metrics and publish a report demonstrating the wide-reaching economic impact of each Council.

We accept that we can derive greater value from our activities if the Research Councils work more closely together. To this end, we will be commissioning a study to see how we can harmonise our schemes while remaining as responsive as possible to our diverse user communities.

Peter Warry's recommendations are well reasoned and he can be assured that no thought was given to dismissing them and no-one was horrified. *Research Fortnight* was wrong in suggesting that the recommendations were not robust. The real issue is about ensuring that they are implemented appropriately – and we shall be ensuring that this happens.

Professor Philip Esler
 Chief Executive, Arts and Humanities Research Council

Peter Warry is quoted as saying "Academics and peer reviewers are the people closest to the research and therefore the ones most able to identify potential spin offs...they should then be asked to consider if it could have an economic impact."

I suggest, that the best people to identify spin offs and economic benefits are more likely to be engineers, practising in what Peter Warry coyly refers to as 'industry' (as if his reference to 'industry' had to be apologised for!).

In the research association with which I am closely involved, The British Coal Utilisation Research Association (BCURA), most of the research is carried out in universities as PhD projects, but the practice has always been to involve industry in the appraisal of projects, from the proposal stage through to the monitoring of work in progress and final report. Peer review has its place, but to get the maximum benefit from the work (even that which might be

regarded as blue sky or fundamental in nature) we have always found that the close contact with industry has been the most fruitful way to ensure that the full implications of the research can be followed up expeditiously.

The emphasis given by some Research Councils to peer review does not always result in the effective exploitation of the research. The involvement of engineers working in industry, not

just as token representatives, in the selection and monitoring of projects generally, would help to overcome one of the long-standing concerns of British science – namely that we excel at discovery, but fail at development and economic exploitation.

Professor James S Harrison
FREng
 Chairman, BCURA

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EXPLORING HMS SCYLLA ... VIRTUALLY

Michael Leece's account of the sinking of *HMS Scylla* that created Europe's first artificial reef in 2004 ('Sinking a Frigate', *Ingenia* 29), concluded with a statement on how the project is helping to secure funding for future innovations in marine science and technology. *Ingenia's* readership may be interested to learn of a parallel activity involving the *Scylla*, that has evolved from one of The Royal Academy of Engineering's Visiting Professors in Integrated Systems Design (ISD) Schemes, coordinated by the University of Plymouth.

The Plymouth-hosted scheme focuses on engineering, energy and the environment – an early concept discussed by the Professorial Team* was how to use the *Scylla* artificial reef as a case study for the ISD students. The practicability of conducting

research trips for large student groups to the wreck site, not to mention obtaining regular colonisation data from divers and remotely operated vehicles (ROVs), presented the team with a logistical nightmare. Consequently, a decision was taken to 'go virtual'!

The Academy funding for the Professorial Team enabled them to commission the construction of a physical scale model of the *Scylla*, before she was sent to the bottom of Whitsand Bay. This model proved to be of great assistance in the construction of a 3D graphical version of the ship by Eugene Ch'ng, a Birmingham University PhD student. Once this was finished, another Birmingham PhD student – Rob Guest – imported the virtual wreck and a virtual reconstruction of Whitsand Bay into a software 3D visualisation tool called the

CryEngine (the power behind the real-time 3D images in the popular first-person game *FarCry*).

Educational institutions can now exploit these powerful software resources for R&D, as many are made freely available on the internet by games companies, just a few weeks after their blockbuster action titles have been launched. The *CryEngine* version of the 3D *Scylla* supports 'exploration' of the wreck, by controlling a virtual ROV using a typical videogame hand controller.

Building upon Ch'ng's mainstream PhD research, the *Virtual Scylla* project seeks to bring the wreck alive, courtesy of developments in 'artificial life', or alife. Alife is the scientific study of the behaviour of biological organisms and systems in order to model how they interact with, and exploit, their natural

environments to survive, reproduce, colonise and evolve. The Virtual *Scylla* modelling, simulating the colonisation of the virtual wreck will ultimately help to raise awareness about the effects on marine ecosystems of such events as climate change and pollution.

It is hoped that the research stimulated using Academy resources will support future activities in fields as diverse as marine environmental monitoring and prediction. This research may eventually help maintenance planning for offshore energy assets – marine turbines, wind farms, oil and gas platforms and maritime archaeology, as well as providing scientific support for future (and responsible) at-sea disposal of large merchant and military marine vessels and other forms of artificial reefs.

Further details about the *Virtual Scylla* project, including images and videos can be found at www.virtualscylla.org.

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* Plymouth's Professorial Team consisted of Bob Stone, Geoff Skates and John Gittus FREng, with support from Dr Paul Robinson of the University's Faculty of Technology.

Virtual *Scylla* Model with 3D Diver and ROV © HIT Team, University of Birmingham

