

DEBATE SUMMARY

Raising the bar - can learned societies and professional institutions particularly the engineering institutions do more to contribute to economic growth?

Held at the Royal Academy of Engineering on 24th September, 2013.

The Foundation is grateful to the Comino Foundation, the Institution of Civil Engineers, The Institution of Engineering and Technology, the Institution of Mechanical Engineers and The Michael John Trust for supporting this debate.

The hash tag for this debate is #fstinstitutions.

Chair: **The Earl of Selborne GBE FRS**
Chairman, The Foundation for Science and Technology

Speakers: **Professor Tim Broyd FEng FICE**
Vice-President, the Institution of Civil Engineers
Professor Jeremy Watson CBE FEng FIET
Vice-President and Trustee, The Institution of Engineering and Technology (The IET)
Patrick Kniveton FIMechE FIET
President, the Institution of Mechanical Engineers

Panellist: **Professor John Uff CBE QC FEng FICE**
Barrister, Keating Chambers

PROFESSOR TIM BROYD gave a brief history of the Institution of Civil Engineers and its role from its origins in the 18th Century through the grant of the Royal Charter in 1828 to the present day with its membership of 80,000 (of whom some 20,000 were living outside the UK). He saw five main areas in which the ICE contributed to economic growth. First, it acted as a qualifying body, setting and enforcing standards for various grades of membership as well as fostering continued professional development and upskilling. Secondly, as a Learned Society, it promoted the exchange of specialist knowledge through the work of Expert Panels, through conferences, debates and lectures and through peer reviewed publications, training materials and courses. Thirdly, it acted as conservator of knowledge with an archive of more than 130,000 volumes and detailed information on the design and construction of most major UK public works. Fourthly, it acted as an independent and impartial contributor to policy on a full range of issues (commercial and process as well as technical) – but it did not act as a trade association or lobby group. Fifthly, it provided resources (including a

Research and Development fund to catalyse the provision of funding from other sources) to promote innovation and excellence.

PROFESSOR JEREMY WATSON gave a very similar account of the role and work of the IET with its membership of 153,000 in 127 different countries. He gave particular emphasis to the IET's efforts to facilitate professional interactions between different engineering disciplines, between engineering and other disciplines (including social sciences) and between engineering, Government and academia. The IET attached importance to championing the role of engineering as a key contributor to innovation and, through innovation, to wealth creation and national prosperity. The IET sought to assist engineers to develop their skills throughout their professional life and to improve the quality of their decision making. The IET saw four major challenges for the 21st Century: energy security, future transport, connected health and cyber security. It believed that it could help meet these challenges by assisting the development of Government policy, by catalysing technical opportunities for

business and by publishing standards in emerging technology areas. He concluded by stressing that society needed engineering as a source of wealth creation and as a contributor to problem solving, that society needed the IET to provide standards, education, expert policy advice and trust and that engineering needed the IET as a source of support, professionalism and knowledge.

PATRICK KNIVETON said that the Institution of Mechanical Engineers, drawing upon the role statement of its founding President, George Stephenson in 1847, now had as its vision "improving the world through engineering". Key objectives for the Institution were increasing interaction among its members, publishing theme reports and policy statements, increasing public awareness of and engagement with engineering, inspiring young people to become engineers (encouragingly the number of students pursuing STEM subjects continued to rise) and enhancing the professionalism of those who work in industry. He stressed the importance of small and medium enterprises (SMEs) to the economy and the crucial need for actions and policies to enable SMEs to grow.

PROFESSOR JOHN UFF joined the panel of speakers at the start of the first discussion period. To stimulate discussion he raised four questions. First, were there too many institutions in the UK (there are 36 professional institution members of the Engineering Council)? Instead of reducing the number of institutions past efforts at consolidation had resulted in two bodies collectively representing the profession – the Engineering Council and the Royal Academy of Engineering¹. Secondly, why did so many of these institutions (about one half) spend good money on real estate in London with prestigious London addresses? Thirdly, drawing upon the lessons learned from the an inquiry into a building collapse in the Christchurch, New Zealand, earthquake, did engineering institutions have adequate procedures to ensure that Codes of Professional or Ethical conduct, so carefully drawn up and promoted, were actually implemented and enforced? Fourthly, why did the institutions still cling to narrow requirements for professional status. The requirements failed to reflect the fact that in

the modern world engineers now worked in areas which lay within the boundaries of other institutions or even other professions? As a result, universities willing and able to offer the cross-disciplinary courses required by modern commerce and industry were still forced also to offer courses leading to an engineering professional status which might be too narrow for their future careers.

In the discussion, contributions indicated a wide measure of support for the positive contribution which the engineering institutions could and were making to economic growth. Yet it was pointed out that no institution actually had economic growth in its mandate. One speaker did question how the institutions knew that they did contribute to economic growth and received the answer that growing membership numbers and the willingness of companies to pay membership fees provided clear positive evidence. In addition institutions did have a range of key performance indicators against which to judge their effectiveness. Another speaker questioned whether a funding mechanism primarily dependent on fee income was appropriate for activities designed to drive innovation and contribute to economic growth. Headquarters in London were seen by all three platform speakers as essential if the institutions were to contribute effectively to Government policy formation.

The theme of rationalisation of the number of institutions surfaced from time to time in the discussion but did not receive support from the three platform speakers; they argued that the institutions responded to the needs their members which were not common to all institutions. They did, however, accept the desirability for the institutions to work more closely together. While accepting the need for engineers to acquire knowledge and skills outside their own specialities and outside the discipline of engineering, they stressed the importance of a solid grounding in the basics of engineering. But it was also argued by some other speakers that increasingly cross-disciplinary issues (for example between engineering and biology) were arising and these would not receive proper attention unless there was an institutional "owner" for them.

Questions were asked about the extent to which the institutions saw their interests and horizons extending beyond the UK. The three platform speakers drew attention to the extent of their institutions' overseas

¹ EngineeringUK works to promote the importance of engineering and engineering as a career – see www.engineeringuk.com .

membership and also to the high regard in which their institutions' qualifications were held overseas. Inevitably some of their policy work focussed on issues of purely UK interest.

Although there was a general welcome for greater awareness by Government and the public of the importance of engineering, many speakers felt that more could be done, especially in encouraging women to enter the profession; there were still far too few female chartered engineers. It might help if the institutions actively welcomed teachers into their membership and actively encouraged engineers to enter teaching – good physics teachers were much needed.

One speaker lamented the negative balance of payments in manufacturing and the disappearance of many big UK engineering companies. However, another speaker felt more optimistic about the future. He saw evidence that high value manufacturing was returning to the UK. He had noted Chinese recognition that the UK had comparative advantage in innovation skills. He was encouraged by the way in which SMEs (which

could grow into the big companies of the future) had been a solid source of employment during the recent economic downturn. Another speaker, referring to US government procurement policies which ensured that valuable contracts were awarded to companies whose innovations had received Government assistance, regretted that EU public purchasing rules (public procurement above a threshold requires a competitive bidding process) precluded the adoption of such desirable policies in the UK.

The Chairman, summing up the discussion, concluded that the answer to the question under debate was an emphatic "yes" although there was clearly more which could be done, possibly through greater collaboration between institutions. However, other bodies able to contribute to long term planning and innovation, especially Government, had an important role to play if economic growth was to be achieved and sustained.

Sir John Caines KCB

TED^x Talk:

Engineers without borders

David Damberger: What happens when an NGO admits failure

www.ted.com/talks/david_damberger_what_happens_when_an_ngo_admits_failure.html

Useful Links:

Engineering Council

www.engc.org.uk

The 36 Institutions licensed by the Engineering Council are:

British Computer Society, BCS

www.bcs.org

British Institute of Non-Destructive Testing

www.bindt.org

Chartered Institution of Building Services Engineers

www.cibse.org

Chartered Institution of Highways & Transportation

www.ciht.org.uk

Chartered Institute of Plumbing and Heating Engineering

www.ciphe.org.uk

Chartered Institution of Water and Environmental Management

www.ciwem.org.uk

Energy Institute

www.energyinst.org.uk

Institution of Agricultural Engineers
www.iagre.org

Institution of Civil Engineers
www.ice.org.uk

Institution of Chemical Engineers
www.icheme.org

Institute of Cast Metals Engineers
www.icme.org.uk

Institution of Diesel and Gas Turbine Engineers
www.idgte.org

Institution of Engineering Designers
www.ied.org.uk

Institution of Engineering and Technology
www.theiet.org

Institution of Fire Engineers
www.ife.org.uk

Institution of Gas Engineers and Managers
www.igem.org.uk

Institute of Highway Engineers
www.theihe.org

Institute of Healthcare Engineering & Estate Management
www.iheem.org.uk

Institution of Lighting Professionals
www.theilp.org.uk

Institute of Marine Engineering, Science and Technology
www.imarest.org

Institution of Mechanical Engineers
www.imeche.org

Institute of Measurement and Control
www.instmc.org.uk

Institution of Royal Engineers
www.instre.org

Institute of Acoustics
www.ioa.org.uk

Institute of Materials, Minerals and Mining
www.iom3.org

Institute of Physics
www.iop.org

Institute of Physics & Engineering in Medicine
www.ipem.ac.uk

Institution of Railway Signal Engineers
www.irse.org

Institution of Structural Engineers
www.istructe.org

Institute of Water
www.instituteofwater.org.uk

Nuclear Institute
www.nuclearinst.com

Royal Aeronautical Society
www.aerosociety.com

Royal Institution of Naval Architects
www.rina.org.uk

Society of Environmental Engineers
www.environmental.org.uk

Society of Operations Engineers
www.soe.org.uk

The Welding Institute
www.twiprofessional.com

Other Useful Links:

Big Bang Fair
www.thebigbangfair.co.uk

Comino Foundation
www.cominofoundation.org.uk

EngineeringUK
www.engineeringuk.com

The Foundation for Science and Technology
www.foundation.org.uk

Royal Academy of Engineering
www.raeng.org.uk

The Royal Society
www.royalsoc.org

Royal Society of Chemistry
www.rsc.org

Science Council
www.sciencecouncil.org

Professor John Uff CBE QC FEng FICE, Lloyd's Register Educational Trust Lecture, May, 2002
Engineering Ethics: Do engineers owe duties to the public?
www.raeng.org.uk/news/publications/list/lectures/Engineering_Ethics_Lecture.pdf

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