

DINNER/DISCUSSION SUMMARY

The Hauser Review of the UK Science and Innovation System

Held at The Royal Society on 18th May, 2010

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

Speakers: **Dr Hermann Hauser CBE FREng**
Member, The Prime Minister's Council for Science and Technology
and Co-Founder of Amadeus Capital Partners
Professor David Delpy FRS FREng FMedSci
Chief Executive, Engineering and Physical Sciences Research Council
The Lord Broers FRS HonFMedSci FREng
Chair, Diamond Light Source, Former Vice-Chancellor, University of Cambridge and former Chair, The House of Lords Select Committee on Science and Technology

DR. HAUSER used the term "Clerk Maxwell Centre" to brand the Technological Innovation Centres (TICs) which his report recommended as transactional centres between academia and industry - intermediate institutions for technology research levels three to eight. While inspired by the German Fraunhofer-Gesellschaft and institutes in Korea, Holland and Taiwan, his proposals were specifically modelled for UK conditions. As there were no longer the major industrial research laboratories to support lengthy development of original research, government needed to endorse and support institutions to develop transforming technologies over a long period until they became commercial. It was only thus that we would compete successfully with other countries. Such centres must work within a national strategy; be focussed on specific areas and be of sufficient scale to make an impact. Criteria for deciding what sectors needed TICs, were: the existence of large potential markets; a demonstrable UK technological lead; a technical platform which would benefit the sector and not only an individual company; an ability to retain in the UK a valuable part of the supply chain but still able to attract global companies. We must act now to catch up with competitor countries, with existing TICs. TICs needed stable long term funding - say £50 to £100m over 10 years per sector with both industry and government support. In addition Government procurement should support product development. Technology should match the market, respond to customer demand, and use customer rather than equity funding. Illustrative areas for TICs were regenerative medicine, renewable energy, and internet technology. The Technology Strategy Board (TSB) should be involved in developing the TIC focus and strategy.

PROFESSOR DELPY spoke both for the Research Councils (RCUK) and the TSB in welcoming Dr. Hauser's report. Both bodies provided support for research and technical development in areas which would benefit the national economy, including creative and financial industries as well as more traditional areas. TICs themselves would fall more naturally under the ambit of the TSB rather than RCUK, but it was the seamless flow from academia through development to commercialisation that it was important to enhance. RCUK already supported many research based innovation and knowledge centres, which sought to meld academia and business. He strongly agreed with the report's emphasis on maximizing innovation potential, identifying areas on which to focus investment and encouraging best practice across sectors. All this linked in with RCUK's impact strategy. The most important contribution RCUK could make to the development of

TICs was their knowledge of the research base and where excellence lay in institutions. The TICs must build on excellence; the RCUK knew which were the top 30 Higher Education institutions (HEIs), and in which areas within those institutions excellence resided. This distribution was not a regional distribution - and to attempt regional equality would be a mistake; excellence was concentrated in certain areas. It was important that TIC funding was new money, and did not come from RCUK or TSB existing budgets, otherwise academics would see TICs as competitors for their funds. It was possible that some existing bodies could become TICs or be melded into them; this would be a major opportunity for the TSB to consider reforming or pruning existing organizations. The TICs should also be looking at how skills - at all levels - could be enhanced to promote both development and customer abilities.

LORD BROERS warned of the danger in assuming that the establishment of TICs would be painless. It would not; because there would be little, if any new money available, and resources must come from existing funding streams. In short, if we were to proceed successfully along the lines of the report we would need to rearrange what we were doing, with inevitable tensions between different funding bodies. But it was our inability to face up to such decisions that had led to the UK's failure to capitalize on technologies coming from our research base. His own experience in IBM and elsewhere led him to some of the same conclusions as the report; such as the power of multi-disciplinary teams. Such teams were expensive and even large companies found it beyond their capabilities, so they saw the need to collaborate and pool resources into national centres such as SEMATECH in Texas and the ATDF (Advanced Technology Development Facility), which had worked with smaller companies such as one with which he was associated. The lessons are that for the development of fundamental technologies scientists and engineers with a broad range of skills with common goals and sustained funding are essential - there can, therefore, only be a few TICs. Moreover they should be open to wide access; it was not only the quality of the research that mattered, it was how it could be accessed by outside companies. TICs will not function properly unless industrial partners engaged with them are clear that the work is needed for their own operations and of interest to the company. They must, therefore, be prepared to assign key staff to a TIC, which should develop means of pursuing projects on a confidential basis. But, it is not only assignment of key staff, and bringing together a wide range of disciplines that is needed - there is also a need to concentrate resources so that people are

constrained to work in a focussed way on bringing scientific advances to the market place.

In the following discussion, there was a general acceptance that the UK needed to organize itself more effectively to be able to take advantage of research breakthroughs which could lead after extended technological development to transformational industrial change. But major concerns were voiced both about the funding practicalities: the ability to focus TICs on selected sectors; the relationship of TICs with the existing academia/business relationships, where universities were already spending much effort on technological development and commercialisation; and the number and regional spread of TICs.

While industrial partners would need to provide much of the funding for TICs, there would inevitably be a need for government funding. Both areas raised concerns. How many large companies were there, such as Rolls-Royce, who would be able and willing to support TICs? Much had been said about access and support for Small and Medium Enterprises (SMEs), but in present conditions there was no way they could be expected to contribute finance. Yet TICs could only work effectively if these companies were involved and fed their customers' needs into the development of technologies. New money from government was an unrealistic expectation, it could only come from mining existing streams. This, in effect, meant looking at existing structures and removing or modifying them. Institutional resistance would be strong, and Ministers would need to demonstrate political gain if progress were to be made. The TSB seemed to suggest that strong Ministerial support was necessary for the Report to start to be implemented, but there was a danger of waiting for this to be forthcoming, and meanwhile losing impetus. What was needed was a proactive strategy from the TSB and RCUK which looked at existing structures and proposed ways of amending them so that there were sufficient funds to enable TICs to be set up. The TSB should also be pressing strongly for government procurement to be used in the way proposed in the report. In present circumstances government departments would inevitably seek the cheapest option for procurement; but, if they did, a major opportunity to develop technology through customer participation would be lost. The Singapore scheme of encouraging multinationals to incentivise local firms should also be considered.

Dr Hauser's illustrative examples of sectors in which TICs might function and Professor Delpy's map of research excellence lay behind concerns about the practicality of TICs. It was clear that much of the research excellence was in the South East, and the illustrative examples also pointed to sectors in which the Southeast was prominent. Was it politically feasible for Ministers to endorse a strategy which removed funding from existing dispersed institutions to strengthen the Southeast? Participants spoke sadly of the fate of the Alvey Report into Advanced Information Technology, which resulted in substantial government funding which was then dispersed through too many institutions and companies, as a result of which there was not enough focused research and development and the UK lost the market to others. Again, why did we now have 24 Nanotechnology centres, when perhaps we should have only two or three? It was because government was not always willing to face up to the consequences of concentration and specialization.

While, as Lord Broer's acknowledged, some scientists might be concerned that their ability to follow their own research priorities, there should be no insoluble problems about academia pursuing existing liaison with business as well as supporting TICs. TICs, it had been agreed, must focus on selected sectors where transformational technology would be taking place, and be driven by industrial companies who saw the work to their advantage. There was wide scope for university start-ups and commercialisation of research outside these areas, as well as participating in the TICs themselves. The problem, it was suggested, was that scientists or institutions might see their

status eroded and funding cut if they were not linked to a TIC or in the sectors chosen for TICs, .

Participants also raised issues about people and skills - ranging from worries about the few new members of Parliament with an understanding of science (which meant more reliance on the scientific expertise in the Lords) to concerns about the number of MBAs who considered themselves managers but had no scientific or engineering background. TICs must be involved in training and developing workforce skills, building on existing structures to improve scientists' understanding of industry and finance, and encouraging them to work more widely outside their own speciality. We need to break down the barrier between those scientists who stay in academia and those who go into industry. The management of TICs should be in the hands of industrialists who would ensure that work was focussed on areas that would deliver benefit to their firms.

In summary participants felt strongly that decisions to implement (or not) the recommendations needed to be made now and that TSB should formulate proactively a strategy without waiting for Ministers to engage. The strategy should aim at delivering adequate funding by a radical restructuring of existing bodies, and be focussed on a few TICs based on areas of excellence, and be industry led and managed. The strategy should be flexible; one size would not fit all needs. The CEO's of major UK industrial companies should be one of the key drivers of the agenda.

Sir Geoffrey Chipperfield KCB

Alvey Report
www.chilton-computing.org.uk/inf/literature/reports/alvey_report/p002.htm

The Council for Science and Technology
www.cst.gov.uk

Engineering and Physical Sciences Research Council
www.epsrc.ac.uk

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

The Hauser Review
www.bis.gov.uk/assets/biscore/innovation/docs/10-843-role-of-technology-innovation-centres-hauser-review

Institute of Physics
www.iop.org

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www.rcuk.ac.uk

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