

REMARKABLE WORK ...

Mike Payne 60th Birthday Symposium

Pembroke College

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WHAT DO UNIVERSITIES DO?

Create

Curate

Preserve

Disseminate

Knowledge

DISSEMINATION

- Training and educating students
- Open publishing of research results in journals, books, working papers, talks and lectures, seminars, www, social media etc
- Commercialisation through consultancy, licensing of software, research materials, patents and spin off companies

IMPACT

- Universities recognised as having a key role in knowledge based economic growth
- In the UK, assessed on research performance and increasingly on their economic and social IMPACT
- Research Assessment Exercise (RAE) became Research Excellence Framework (REF i.e. RAE + Economic Impact) became Knowledge Exchange Framework (KEF i.e. REF+ Economic and Societal Impact)
- Commercialisation no longer optional

TECHNOLOGY TRANSFER (Part of KEF)

- Consultancy
- Sales and licensing of research materials (tangible research products)
- Licensing of copyright (especially software)
- Protection and licensing of IP - largely patents: designs and trademarks uncommon
 - Licences to both established companies and spin offs
- Spinning out and seed fund investment in spin offs

WHY DO WE DO THIS?

- Economic and societal benefit
- Part of universities' responsibility and mission
- Benefits inventors, their departments and the university
- Important to manage expectations as financial returns to university itself are modest but induced investment externally is very large

RESEARCH AND DEVELOPMENT TOOLS

CAMBRIDGE MATERIALS SELECTOR and GRANTA DESIGN - academic research with ultimate global impact - sold to ANSYS Inc.

CASTEP (CAmbridge Serial Total Energy Package) - density functional theory - ab initio electronic properties of materials

The DTI Audit

1992 DTI (Department of Trade and Industry) sponsored Technology Audit

“to help higher education institutions (HEIs) identify opportunities for income generation arising from research activities”

“...initial survey of the skills, knowledge, facilities and technologies potentially available from selected departments and centres”

1993 the bid, in conjunction with The Technology Partnership (TTP) ,was successful, 2 additional temporary staff recruited and some 170 opportunities assessed following interviews with 151 staff carried out across the STEM departments.

Phase 1 First Encounter ... 7 January 1993

A certain Dr M C Payne was interviewed and he described some software for Total Energy Pseudo Potential Calculations, the summary report on the opportunity included :

“... OF ACADEMIC INTEREST WHEN CAPABLE OF WORKING WITH 100 ATOMS. THERE IS INDUSTRIAL INTEREST NOW THAT 1,000 ATOMS CAN BE MODELLED... BIGGER COMPUTERS WILL SOON CALCULATE 3,000 TO 4.000 ATOMS ... **REMARKABLE WORK BUT DIFFICULT TO ESTIMATE THE MARKET.** SEVERAL COMPANIES ARE INTERESTED. FURTHER FUNDING IS URGENTLY NEEDED.”

Phase 2 Assessment by TTP ... 27th April 1993

12 Opportunities (only) were selected for more detailed review by the consultancy partner

Biosym recognised as a possible competitor, several large pharmaceutical and material companies approached and some interest shown including from Oxford Molecular Design.

However, they noted that Molecular Simulations (purchaser of Cambridge Molecular Design)

“HAVE SHOWN A CLEAR INTEREST IN WORKING WITH DR PAYNE AND DISCUSSIONS HAVE PROCEEDED TO A DRAFT DEAL AND TERMS OF BUSINESS”

“...DR PAYNE MAY WELL WISH TO DISCUSS THE DETAILS OF LICENSING ARRANGEMENT WITH THE WCIU.”

(Wolfson Cambridge industrial Unit (WCIU) was Cambridge Enterprise's precursor and inter alia carried out technology transfer for the University using Lynxvale Ltd as its commercial vehicle)

Phase 3 (post Audit) - commercial exploitation

A follow up report from WCIU in June 1995 stated

“ THE ORIGINAL SOFTWARE HAS BEEN SUCCESSFULLY LICENSED TO MOLECULAR SIMULATIONS, A US COMPANY THAT BOUGHT A LOCAL COMPANY, CAMBRIDGE MOLECULAR DESIGNS LTD. SOME YEARS AGO.”

MSI became ACCELRYYS and then DASSAULT/BIOVIA and a Cambridge Enterprise publication of 2019 reported that

“COMMERCIALY , CASTEP HIT A CUMULATIVE TOTAL OF **\$40 MILLION** IN SALES IN 2017”

An Outstandingly Imaginative Example of Knowledge Transfer

Fundamental academic research turned into a product used widely in the material and chemical industries to simulate energetic, structural and spectroscopic properties of materials.

Potential use in pharmaceutical sector e.g. early collaboration with GSK on p450 (drug metabolising liver enzymes)

Continual software development by the CASTEP Development Group

Free licences for academic use leading to thousands of publications

Research results and commercial income cycled back into the Development Group and the University

Mutual benefits “impact” very clear

...and all thanks to

Professor Mike Payne FRS, a uniquely talented and endlessly stimulating researcher with whom it was my privilege and pleasure to work with for over 2 decades