

## **Cambridge and the UK: maintaining excellence in unstable times**

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The topic of this presentation is immediately current, even as I write this short summary. We sit at the beginning of April in the UK without any resolution to the long-running national debate that surrounds Brexit. This single example of instability has been a saga that has dominated the internal debate and in the UK and is an example of the type of uncertain external environment that the Higher Education sector faces yet is limited in its capacity to influence outcome. Such uncertainties face Universities in other countries but for the purposes of this presentation I will concentrate on how these influence the environment in which this vital sector for the UK national interest has to operate. However, as we may see through the lens of Cambridge University such turmoil is nothing new to Institutions with a long history!

### **The role of a University**

Cambridge is a long-established University, formed as a result of scholars leaving Oxford in 1209. The continuous genealogy of universities, although often attributed to ancient times of Greece and Rome, realistically begins in medieval Europe, and with the Church. In Bologna, Paris, Cambridge and Oxford, the duty of the medieval university was to prepare leaders for the Church and for public life. However, the advent of scientific studies began to bring out a new function which was not just education of undergraduates destined for administration, law and the religious life but it engendered the spirit of discovery and ultimately translating those new ideas and discoveries into benefit of society. This begs the question of what constitutes 'society'. Clearly, in the early days, society was restricted to privileged groups – the state and church in particular. However, this quickly became the community in the local vicinity of the University, gradually expanding to the nation. And some today remain locked into this concept, yet most academics in Universities world-wide view today's world as a single society and therefore the ultimate beneficiary of discovery and new ideas.

These concepts were developed by thinkers and philosophers in a 19th century that was busy for Higher Education, as for so much else. Wilhelm von Humboldt in Germany and Cardinal John Henry Newman in England and Ireland set out competing and overlapping Ideas of what universities should be for, building on, rather than demolishing, the medieval idea. By a quirk of fate and global politics, Britain rejected the development of new Universities formed as institutions with religious affiliation and consequently the European 'Free University' (i.e. secular University) movement did not penetrate widely in the UK. Equally the 'Bismarkian' approach of separating teaching and research never took hold. By historical association the UK model transplanted to University systems throughout the then

British Empire as well as the USA, which explains the closeness of the US and UK University and differences between UK and continental European systems of Higher Education. In the 20<sup>th</sup> century, the unification of teaching and research in universities, following Humboldt, became the common paradigm in the UK and USA rather than development of specific teaching and Research Institutes. Furthermore, universities began operating on a global stage in keeping with the paradigm of global society. My point is simply that in every historical and geographical incarnation of a university, 'making a difference in the world' has been a recognizable aim.

But there are common principles that are espoused by Universities, wherever they are found. Central to these is 'Academic Freedom' – the freedom of individual academics and students to thought and investigation in order to enable them to develop new concepts and discoveries. However, academics do not withdraw into universities to think deep thoughts - they deepen those thoughts by constant engagement with others, hence the deep held conviction of the freedom to collaborate freely. Universities, though sprung from monastic roots, are not monasteries - they are functionally the opposite.

This concept is well enshrined in the mission statement of Cambridge University only one sentence long:

'The mission of Cambridge University is to serve society by teaching, research and learning at the highest international level.'

Therefore, there is an implicit contract between society and Universities: society endows Universities with privileges, such as 'Academic Freedom' and 'Institutional Autonomy' because there is **trust** that their use of these freedoms will generate societal benefit.

However, society, especially national society, has placed far greater demands on the purpose of a University than originally intended and this is given greater prominence because Universities are often supported by public funds. Universities are tasked by society through governments and countries that support them with multiple objectives: to educate the population of the host nation to an advanced level; to promote social mobility in that nation by providing a level playing field for access to that education, regardless of social background; to make new discoveries through research and thereby push back the boundaries of human knowledge; to act as custodians of knowledge and of culture; and of course to generate income for the country, by attracting overseas students, and by making useful and patentable inventions which in turn result in wealth and job creation.

In some ways the miracle is that most Universities deliver on all these goals, sometimes with more emphasis at an individual institution on one or more of these, but as a sector it delivers on most maintaining the delicate concept of public trust.

How does Cambridge deliver on these goals?

- 1. Education.** This is first and foremost the function of a University – to build up the next generation who in turn will build the future. New ideas stem from ‘standing on the shoulders of giants’, a phrase used by many academics to describe how they attained their achievements. But the education provided is distinctive and different at each University albeit with a common goal. I believe this variability is a fundamental strength of higher education rather than a weakness. It allows for choice by the student of the course of study that suits their own goals best. Yet this approach is expensive. Cambridge has a unique (alongside Oxford) method which is based around the University and its constituent Colleges. Undergraduates apply to the University by choosing a course of study e.g. history, at a specific College. On entry the student receives instruction at the University in terms of formal teaching (i.e. lectures or laboratory studies) and is examined receiving their degree from the University while the College provides small group teaching (often 1:1) to supplement and enhance the formal education. This is a hugely intensive and thus expensive undertaking – the average cost of a year’s instruction to the University and College is £19,000, yet the government will only provide the student (UK and EU) with a loan of £9,000, which is also the maximum the University can charge. The difference of approximate £80 million each year has to be made up from other sources – mostly our endowment. Financial management can just manage this but it causes conflict if government would seek to interfere with the admission process or course content/duration – after all it doesn’t pay for it in the UK system!
- 2. Postgraduate/postdoctoral studies.** Nearly all Universities recognise that higher education will not end at undergraduate level but requires further study – taught Masters and research-led PhDs. There is growing demand for more of these qualifications – while Cambridge has 11,000 undergraduate students, there are an additional 6,000 postgraduate (4,000 PhDs and 2,000 taught Masters) and nearly 4,000 independently funded postdoctoral researchers. Responsibility for these communities is vital for their development as experts in their fields but also because of the national need for their skills.
- 3. Social mobility.** The demand for places at a University such as Cambridge results in intense competition at undergraduate and postgraduate level; only 20% of applicant are successful in their application at Undergraduate level. Many of the unsuccessful students will achieve the academic standards through examination yet will not have entry. So how to create opportunity for those from disadvantaged backgrounds is a key question – recently the University announced a call to raise special funding to support such individuals.
- 4. Discoveries and New Knowledge.** Most of the world-leading institutions are recognised as such not through their excellence in teaching (which most academics will see as their primary function) but through research output. Therefore, great care must be exercised in interpreting so-called league tables as these are

dominated by what is easily measurable rather than the full mission of a university. Research output is easier to evaluate – in fact there is not a single credible internationally validated measure of teaching excellence! It is also the major source of funding to such Universities and largely what attracts the best international staff. Of the total annual turnover of the University of £1.5 billion per annum, nearly £450 million is through competitive grant awards by government and charitable foundations. This is also a source of great pride to the University – in 2018 we celebrated our 97<sup>th</sup> Nobel prize to Greg Winter for phage display and humanisation of monoclonal antibodies for human utilisation. However, it places emphasis on research as the major criterion when academic staff are appointed, but all these staff from the youngest Lecturer to the Nobel prize winner are expected to teach and supervise! Yet the pursuance of ‘new knowledge’ be it in philosophy through Wittgenstein or new drugs through Winter not only fulfils the Humboldtian vision of a shared responsibility of student and academic to seek new knowledge but delivers the unwritten contract of benefit to society – not just economic but also social.

5. **Generation of Intellectual Property and economic wealth.** Cambridge University through its creation of and engagement with the Cambridge Phenomenon has developed Europe’s largest industrial cluster. There are currently over 4,000 companies within a 20-mile radius that build on the know-how of the University. 15 of these now are valued at over £1 billion and ~4 at >£10 billion. Cambridge is small with a population of ~120,000 and a surrounding population of 600,000, yet 17% of all high-tech start-ups in the UK happen here, and between them they have created 60,000 jobs. They attract multinational research companies such as Microsoft and AstraZeneca and contribute £13billion per annum to the UK economy. This is considered a huge national success, but it does not happen overnight. This is based on 50 years of development, investment and belief in the importance of fundamental studies that eventually translate and a *laissez-faire* approach that does not pre-define disciplines or domains but allows the opportunity to all. There is a widespread view that external imposition of structure would destroy rather than enhance the Phenomenon. Maybe a success of chaos over order?
6. **Repositories of Infrastructure, Knowledge and Culture.** To maintain this approach to education, learning and research requires a considerable investment in maintaining an expensive infrastructure. This consists of libraries, some dating from the middle ages as repositories of knowledge, as well as University museums (11 in total, the largest being the Fitzwilliam Museum) which all function to support the three principles of the University mission. For some of the Colleges this also includes UNESCO treasures such as Kings College Chapel. But the biggest expenditure is provision of laboratories, equipment and accommodation within a short distance from the core buildings/laboratories of the University – the largest such development was to build a new site which adds 15% to the total size of the City at a cost to the University of £1billion. This highlights the need to invest at scale

and risk – possibly the true price of institutional autonomy. Universities have to be sustainable, make appropriate investment decisions recognising that under the current structures within the UK there is no ‘safety net’. So, autonomy also comes at a price.

If Universities are the mainstay of the UK research effort and have the right to autonomy, they have to be able also to manage risk and uncertainty as well as delivering the academic agenda. This leaves them exposed to uncertainties and at present these abound in the UK and elsewhere.

### **Uncertainties**

There are inherent uncertainties that Universities face with respect to finances, investments, infrastructure, income but most higher education institutions are well versed in managing these. The major issue is that the external uncertainties are gathering on the horizon and the scope to mitigate their potential impact is limited. Broadly these can be identified as:

1. **Finances.** The previous issue of societal trust may not be sustainable as there are some suggestions that many view the Universities as rich in a time of relative austerity and increasing public pressure on equality and diversity and non-selectivity. This has led in the last general election to a drive to reduce or abandon student fees, but without guarantees that the resource would be replaced. Most Universities would need to consider where cuts would be made and student numbers may be one or expanding courses, with a reduction in student satisfaction. Alternatively, new models of approaching higher education through on-line or two year courses (46 week study/year) or even complete independence will be being considered. This will be debated in June when a report is issued to Parliament (Auger Review) and its recommendations will be closely followed. But as we do not know its content it makes planning very difficult.
2. **Pensions.** Universities as independent entities are required to provide a pension scheme for all employees and the scheme (Universities Superannuation Scheme – USS) is in significant deficit, which will require a considerable increase in employer’s contributions and add many millions to the salary bill. How will this be accommodated – potentially job losses or failure to take on new staff may happen.
3. **Staff recruitment and retention.** Being independent and competitive Universities compete globally to attract the best academics. However, this leads to considerable and spiralling salary inflation as the competition at the highest level is with well-endowed US Institutions. Will this result in a narrowing base of institutions able to compete and reduce their number and therefore the opportunity for staff to be fully engaged at research-led HE providers?
4. **Higher Education Act 2016.** A series of reforms of higher education were passed in 2016, which enshrined in law – institutional autonomy but split the funding of

research and education between two government ministries. The delivery of the education agenda is now under a government regulator who will register Universities and ensure that they deliver 'value for money' for the 'consumer' (i.e. student) and 'open the market to new providers'. The very commercially orientated language of this provision causes alarm in academic circles! Similarly government research funding (a total of £8 billion per annum) has been placed under a body (United Kingdom Research & Innovation Board – UKRI), which must deliver not only funding for fundamental research but also applied and commercially relevant research. Again, this has caused alarm in academia, although in practice little has changed. As the government is committed to moving to 2.4% of GDP into R&D there is an optimistic position that in reality available resources will grow considerably.

5. **BREXIT.** I thought this might have been resolved but it remains in limbo. Quite separately from the political dimension the consequences will be far reaching especially with respect to R&D. UK receives the largest share of ERC and a very large share of all EU funding in R&D and UK institutions have enjoyed consequent collaboration with so many European centres. Most telling is the observation that other EU countries now form the largest group of collaborators (rather than the USA) by publication. The possible financial loss will probably be partly recoverable but the academic loss to the UK would be huge. To date the politicians are committed to the 'closest possible' links with the EU, supported by so many academics in the EU, but with the current turmoil who knows?
6. **Immigration.** This cannot be disassociated from BREXIT. However, limiting immigration is a particular problem especially when so many of our best investigator are truly international in origin. Any severe restriction would impact negatively on the ability of UK institutions to compete globally.

There are many other risks in the longer term that could be added and this presentation could become very negative. However, wherever there are challenges there are also considerable opportunities and the determination of the academic and University sector will be to stay true to its principles, seek the widest possible international engagement and look to develop new ideas and discoveries for the benefit of society. The situation may be different but long-lived Universities such as Cambridge have lived through worse – the Reformation, Counter-Reformation, Counter-Counter-Reformation, civil war, global conflicts and still remain world-leading institutions. I believe that this will be the case in the future.