



An Era OF EXPANSION

Construction at Cambridge University
1996–2006

DAVID M. ADAMSON

ROUTLEDGE

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This book is dedicated to Oscar, Kaspar and Ryan:
may you do well whatever ups and downs you go through.

Foreword

The medieval Cambridge Colleges cluster around the centre of Cambridge as if they were placed by some master planner, but of course there was no master planner. It was merely that there was little else in medieval Cambridge so the colleges were built comfortably side by side and this continued for hundreds of years. In the nineteenth century an increasing number of University buildings appeared where scholars of a given discipline from all of the colleges gathered together to pursue their interests. This began with the scientists because their laboratories were too expensive for a single college. Subsequently all disciplines gained their own buildings although this took until the end of the twentieth century when new buildings for law, divinity and English were built. This was a time when a large number of modern research facilities were also being built for medicine, engineering and the sciences, resulting in the most rapid expansion the University had ever seen. The administration of the University was stretched to the limit of its capacity in realising this expansion and was at last persuaded that it was necessary to develop a long-range plan.

David Adamson tells the story of the buildings of Cambridge University from the very beginning when the scholars came to Cambridge in 1209 to escape the town riots in Oxford. The early history is fascinating but is not the main purpose of this book. The major purpose is to record how the University successfully provided the facilities and buildings it needed to maintain its position as a world-leading university towards the end of the twentieth century. This was a period of intense international competition as US universities with their greater resources raced ahead of most of the world's universities, but Cambridge maintained, even enhanced, its position, which was already close to the top of the international ranking tables. This could not have been done without the unprecedented expansion of the University estate. An expansion which was made more difficult because many of the new buildings had to house highly sophisticated scientific equipment and all had to meet increasingly severe environmental and climate change standards. To succeed it was necessary to find new ways for architects, engineers and contractors to work together. It was also necessary to reform the University's decision-making processes and to raise immense additional funds. Lastly, and of equal importance, the University's Estate Management Department had to develop the

skills to find the way through the UK's tiresome planning regulations, a task made more difficult by the continual revision of these regulations.

It had become clear much earlier in the twentieth century that more space was needed and colleges and university departments had already built to the north, west and south of the expanding city centre. This unstructured expansion continued, especially for the sciences, medicine and engineering, but without a sufficiently comprehensive long-term plan. There was in the early 1960s an unsuccessful plan to expand in the centre of Cambridge. Three large tower blocks were to be built near the old Cavendish laboratory but this project failed to gain planning permission, fortunately, because these towers would have dwarfed and obscured the precious and well-proportioned medieval buildings, much as the concrete buildings built in the same era obscured St Paul's Cathedral.

The first attempts to look further ahead were in the 1970s. For example, Peter Swinnerton Dyer who was Vice-Chancellor from 1979 to 1981 identified an ellipse that enclosed a large area of land to the west of the city and proposed that the University should expand to the west. In 1971 the Cavendish Laboratory began to move to the closest end of what was to be called the West Cambridge site, a 66-hectare rectangle that lies along the southern side of the Madingley Road just north of the ellipse. The University had progressively acquired this land starting in 1923 and departments had moved there in the 1970s but it was not until 1996 that a public inquiry finally gave approval for a major expansion of the University on this site and a master plan was commissioned. The plan described in broad terms how the site would be developed. It was to be mainly for science and engineering but some housing and limited catering facilities were included. A large proportion of this expansion has now been completed.

Soon after this, in 2002, the University made the case to the county and city planners that it should be able to expand into the triangle of land bounded by Huntington Road, Madingley Road and the M11, known as the North West Cambridge site. This land was within the green belt but the University's case prevailed and permission was given to go ahead on the basis that the University said that it would include housing, retail shopping and a school, in addition to the development of the University and its colleges. Gaining this planning permission was a major achievement for the University as it ensures space to fulfil its ambitions for many decades into the future. There are few universities in the world that have this much space available adjacent to their existing facilities.

Adamson describes in detail how these strategic advances were made, and how at the same time £750M of new buildings were completed. He came to Cambridge from Bristol University with extensive experience in university estate management and this enabled him to stay ahead of what became, as we entered the twenty-first century, an almost overwhelming onslaught of activities. He reformed the way buildings were planned and constructed, turning away from the concept of having an iconic architect dominate the

whole process, to one where the users of the building, the engineers and the contractors were involved from relatively early in the process. He introduced the concept of the representative user, where a single point of contact for a department or faculty was identified to present a coherent interface to the designers and builders. He also insisted on optimising cost in discounted cash terms over a ten-year period to avoid what had happened in the past where maintenance costs had been hopelessly under-estimated. Finally he ensured that post-occupancy evaluations were carried out to see how well a building met the needs of its users. The net result of these changes was that buildings began to be built on time and to budget, unlike those built in the 1960–1970s where there was general overspend in the public and private sector and projects almost always ran behind schedule. It also meant that the buildings more closely met the needs of the users and were better suited to the activities they were to house. Not everything worked out as hoped but the new procedures produced feedback on what had gone wrong and allowed everyone to do better the next time around.

The ability to build high quality infrastructure economically is setting nations apart. We often hear that China completes projects in a fraction of the time we take in Europe. This book describes how we can close the gap thereby enabling us to take full advantage of our world-leading scholarship and research. Anyone who knows Cambridge will enjoy the book because it reveals what was going on behind the scenes during the rapid expansion of the city and the University. There is much to look back on and much to learn about what is going to happen in the future. For those in the University it throws light on why things happened the way they did and the reasoning behind the future planning. It also describes the governance changes within the University that improved its ability to plan its future. Anyone interested in construction, and particularly in building programmes for universities, will find this book a fascinating read and a valuable reference book full of ideas about how to improve performance, and especially how to provide buildings and facilities that meet their users' expectations. No university can compete in today's research environment without state-of-the-art facilities and this book provides a plethora of examples about how, and how not, to go about building them.

Professor Lord Broers FREng FRS

Preface

When Alec Broers stepped down as Vice-Chancellor of the University of Cambridge in 2003 he suggested that I write up the hitherto unprecedented expansion of the University. The building and property programmes had been moving too fast to record the back-stories: why and how new buildings and property deals came about. 1996–2006 was also a decade of substantial change as the University developed new policies for management and capital procurement while funding for projects came flooding in. It was interesting to observe how people in university management and people in estate management actually operated, and what was the outcome, and I hope that it will be of interest to a wider audience, now and in the future. A shrewd architect walking in the middle of Cambridge suddenly stopped and said ‘if only someone had written such an account of University building development 20 or 50 years ago’. Colleges and other universities have written records of their estate development as useful references, and for this decade of change and expansion it seemed a good time for the University to do that. I waited six years before starting this assessment so as to allow enough time for a mature view to emerge after the end of the decade, 2006. I couldn’t, though, wait too long as many of those involved were moving away or losing clarity of memory about that decade, and records were getting lost or becoming inaccessible during high turnover of staff, and changes in office systems. It also seemed timely to document how the path was prepared for the next surge of expansion, at North West Cambridge.

More generally, this is a good time to assess how national reforms of the construction industry in the mid/late 1990s have been working through in the development programme of a client which is in the public sector but has many of the characteristics of a private sector client. Individual projects often get written up, usually soon after the new building is handed over, but very rarely is there a review of a whole programme of work some years later.

There are thousands of facts and figures in this account, mostly taken from internal management control documents retained from the period. Where records are not available or there are gaps I have used the best information available. Definitions of costs and dates in assessments of capital programmes are not straightforward in the construction industry; costings quoted generally

exclude associated maintenance and minor works jobs except when subsumed into the main project; start dates are when preliminary works began if those were substantial, and completion dates as handover even if some fitting-out was still being done. However, I hope that the general picture is clear enough to be of some interest and value.

I have tried to colour and illustrate the factual narrative with personal observations from my former position as Director of Estates responsible for planning and managing the University estate at Cambridge. They are just personal views. I hope they are fair, and I apologise for any that are not.

DMA Nov 2014

Note

References to 'Reporter' are to Cambridge University Reporter.

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I would like firstly to thank Lord Alec Broers of Cambridge for suggesting to me that I should write an account of the physical expansion of the University over the decade of its biggest expansion to date, and for encouraging me during the drafting; I would also like to thank him for his inspiring leadership, and his confidence, sometimes justified, in the University's capital procurement programme.

It has been good working with Benedicte Foo who has developed case-studies of nine buildings; her shrewd architect's eye and her assessments have enhanced this account, and I thank her very much.

I would also like to thank Geoffrey Skelsey, Chef de Cabinet to successive VCs from 1977 to 2003, for his knowledge and advice from the start, Alison Wilson for her wise counsel and her experienced editing, and Alan Franklin for his comment and technical help.

I am especially grateful to well over 50 academics and administrators in the University of Cambridge who through interviews and other discussions have given me their views and assessments, and have provided information directly and by access to documentation, and to the leaders of the local community and of the construction industry who also have given me their views and have allowed me to quote them. I am also grateful to Wayne Boucher and BDP who have kindly let me include several of their photos.

I want to thank especially the staff of the Estate Management and Building Services during the period 1998–2005: for their professionalism, their hard work and their cheerful willingness to commit to team-working. In the football phrase, they kept at it and they done good.

I am grateful to King's and to Murray Edwards Colleges for lots of things, and to the Universities of Bristol and Cambridge for the wonderful professional opportunities to look after the various aspects of their estates.

DMA Nov 2014.

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1 A history of the estate of the University of Cambridge

Hinc lucem et pocula sacra.

From this place, we gain enlightenment and precious knowledge.

University of Cambridge motto

History always matters; to understand how the University of Cambridge meets its current challenges, understanding its history is crucial. How the University managed its estate in response to the sudden burst of building opportunities and demands at the end of the twentieth century is rooted in the way the estate was then configured and how people thought about it. The locations and nature of University buildings were shaped by centuries of decisions by small groups of highly motivated and highly intelligent academics dedicated to developing their own subject interests; only rarely were these decisions made within any sort of overall University-level planning. Further, a higher priority was given to implementing current academic leaders' needs as current academic leaders saw them, than to anticipating the needs of those who would succeed them. So, while at the start of the decade documented in this book, some of the University estate was effective by current criteria, large chunks of it were far short of the top international standards of its researchers, teachers and students, and overall it was managed in a fragmented way serving laudable, and justifiable, but rather immediate aims. The estate challenge suddenly facing the University as it approached the Millennium was how to stitch together the best aspects of that fragmented past with the huge abilities of its current academics, and to meet the need to modernise and greatly expand its stock of buildings and infrastructure; and to fund and manage the tsunami of construction projects that swept through the University.

The early days

In the beginning there was Oxford and over to the east near the edge of the coastal swamps a market settlement around the bridge over the River Cam. As in other settlements in the Fens, diseases there were rife and strangers unwelcome, but when a small group of young men appeared saying that they'd come from Oxford fearing for their lives after a tavern brawl in which a young woman, maybe a bar-girl, was killed and a couple of the students involved were hanged by the townsfolk, they were allowed to settle. And settle they did, supported by the many religious foundations. And thus started the chain of events that led to the University of Cambridge.

That was in or around 1209. The Cambridge area had long been settled. Recent excavations in the grounds of Fitzwilliam College have unearthed flint tools and pottery from a farm that was flourishing around 3,500BC. The first known bridge over the Cam (or Granta as it was then called) was built by 875AD as a key link for the market town and, as the Domesday Book of 1086 noted, there were already prosperous residences and businesses, and many religious institutions with a lot of power and independence since the church had stood up to the King after the murder of Becket four decades earlier; it was into these institutions that the six scholars from Oxford settled.¹ One can only imagine what it must have been like for these young lads: tired and a bit frightened, rather confused, and probably rather unwelcome. But they set about continuing their studies, and increasingly teaching others: the logic of closely pairing research and teaching has long been one of the great strengths of the University, and has been stoutly defended through the ages.

The subjects that young students of those early days were studying were streamed: first a grounding course in grammar, logic and 'disputation', music, arithmetic, geometry and astronomy. Some students, on completing those studies, went on to study law, divinity and medicine at what we would now see as 'University level'. The 'scholars' (students) were 'clerks', training to be clergymen. The considerable breadth of studies reflected well the breadth of what was seen as the world's knowledge. (It is interesting to compare that breadth of education with the recent trend back towards inter-disciplinarity.)

There grew, certainly by 1226, an organised network of classes of scholars, the senior of whom acted as supervisors, or 'Masters'; their leader, from 1412, was called 'the Chancellor'. The scholar market soon became more regulated: King Henry III set out rules to protect scholars from the landlords who were ripping them off for rent, and to legislate that only scholars enrolled by recognised Masters could stay in town. Soon there was a body of Masters who, with the Chancellor, and later his deputy the Vice-Chancellor, were regulating examinations as well as classes, with different levels of scholars, then as now, differentiated by the length of their gowns and colour of their caps and hoods.

Extensive records of property, either privately owned or owned by the religious foundations, still exist. Over the centuries, property of both types were transferred to the nascent Colleges, from the thirteenth century onwards, and especially after the Dissolution of the Monasteries from 1536. An early significant property transfer, in 1284, by the Bishop of Ely (Hugh Balsham) was St Peter's House, set up as Peterhouse, the first College to survive to the present day. From then on, the Colleges continued to grow in number and size. At times, the growth was stimulated and achieved by royal patronage (especially of Lady Margaret Beaufort and Henry VIII), at times stimulated when monarchs and governments had particular suspicion of Oxford. It is suggested, for example, that Henry VI's worries about 'Oxford' influence in his court led him to the surprising decision to have King's College set up in Cambridge; and later, for a while during the Reformation, Oxford was seen as a 'hotbed of Lollardy', though to be fair, a lot of key reformers were also in Cambridge.

'The University' as an organisation is not be conflated with the Colleges *per se* which were and are legally separate entities, albeit closely and generally amicably entwined with the University; they hold their own estates quite separate from the University estate with which this book is concerned: matters of College estates are only mentioned in this record when they affect the University estate directly.

The first building to be erected specifically for teaching in the University was the (Old) Divinity School. The site, a slight mound of gravel, later used by King's College and the Old Schools, was bought in 1278 (so, the start of the University estate just before the foundation of the first College to survive), but it was not until about 1350 that the first building was started, to be completed around 1400 (the construction time hence being about five times as long as that of the 100-odd projects that were to expand the University by 33 per cent from 1996 to 2006). That first building, with its windows of irregular shape, was built for the purpose of teaching Divinity. There were further buildings on the site: in 1430–1460 for the teaching of canon law, and in 1457–1470 for teaching civil law and philosophy, with a library. The West Court of the Old Schools (including the Syndicate Room and offices for the Registry and others) includes the Council Room (finished in 1466). Its ante-room, known as the Dome (the VC's office, since 1975), was formerly part of King's College: it was above the porters' lodge of the original court of King's College.



Figure 1.1 The Old Schools

By courtesy of info@Cambridge 2000

It was during the mid fifteenth century that the University started to develop its estate. Land around the current Senate House was bought to put up buildings for teaching and ‘disputations’, a chapel and a library, and a ‘treasury’ for chests to hold the money paid by scholars. The University’s financial assets are still known as ‘The Chest’, and one such ‘chest’ lies in the office of the Registry (Registrar in other universities). As long as the University estate was just the buildings around the Old Schools, it was relatively easy for its management to be sensibly controlled by a small group of the Masters under their Chancellor. Later however, when teaching and research requirements increased, and the actual and perceived autonomy of emerging Faculties (departments) grew (in a manner that in some ways reflected the well-established autonomy of the Colleges), it became more and more difficult to develop and maintain an overall plan of what the University owned and have some idea of how that should best be developed and managed. Indeed, it was not until nearly 800 years after the start of the University that it developed and agreed a coherent schedule of its estate, by then worth £2.4bn, and began to analyse how it should be developed.

The University estate grew non-contiguously, and in a manner which could be called haphazard, but which equally and more constructively can be seen as a series of generally sensible decisions by clever men who usually discussed matters sensibly: sometimes at huge length and repeatedly, sometimes briefly, often in caucuses deliberately limited and shaped to suit the dominant players. The decision-makers were, as now, leaders in their departments and in their Colleges: all academics for much of the University’s history had to have College Fellowships. (In recent decades with rapid growth in academic numbers but little increase in the number of Colleges, the proportion of academics with College Fellowships has fallen considerably.) It was from the mid-sixteenth century that the Colleges as such started to play a central role in how the University itself developed, with their Heads of House taking key University roles.

Although there was little expansion beyond the area of what now is the Old Schools, maintenance of those buildings was documented. An account of a contract dated 25 June 1466 notes:²

A contract for Indenture of covenant for carpenter’s work on the old Schools [to] ... supply, carriage and workmanship of timber for the floors and roof of the new Schools before Lammas Day for payment of £23 6s 8d in addition to the £10 paid at the making of the agreement.

A church existed on the site of Great St Mary’s (properly, the church of St Mary the Great) by 1205; however there was a major fire in 1290, with re-construction, and then re-consecration in 1351. An attack during the Peasants’ Revolt in 1381 led to the Statutes and Charters being taken out and burnt in the Market Place (later Square). The church was also the administrative centre of the University until 1730 when Senate House became the