



Annual report

Selwyn College Cambridge, 2009 – 2010

Master's reflections

Last year was a year for frightening the horses, and to judge from the many responses we received it was very effective. Many of you wrote to express a combination of shock and of appreciation that I had been blunt about the situation that faced the College.



One does not want to do this kind of thing too often, of course, because the effect would be dulled; but I am glad that I chose to do so.

This year I feel that I can be a little more upbeat despite the fact that the future of tuition fees is still very

much up in the air; as is the question of what proportion of these fees, if any, the College might see. Discontent is in the air and both students and school children across the country have woken up after decades of slumber to find themselves in the midst of a very different kind of reality. Who knows where this may lead us? Like many, I am sure, I am personally conflicted between the need to secure the financial future of the College on the one hand and sympathy for the next generation on the other.

As you will see from the Bursar's Report, Selwyn continues to make inroads into the yearly deficit and to work hard to strengthen its financial position. After a hiatus of some six months, January will see the arrival of a new Development Director who will, I am sure, inject yet more professionalism into the task of persuading you, with a mixture of guile and true commitment, that the College that looked after you in the past continues to need your support now and into the future.

Help need not necessarily come in the form of cash, of course. Two alumni, for example, from very different age groups but working for the same firm, are in the process of producing detailed architectural drawings for a redesign of the southwest corner of the College, including the kitchens and the 'New' SCR. This is a gift in kind and none the less welcome for that. The funds for such a project do not yet exist but when plans are drawn up in advance it makes it that much easier

to look for support later on. It shows everyone that we continue to look forward rather than bemoaning the present.

The first thing on the agenda, however, remains the refurbishment of Cripps. There have in the past been a number of benefactors from outside the immediate community and none more generous than the Cripps Foundation, who well over forty years ago were persuaded by Owen Chadwick to provide a major boost to Selwyn's accommodation. The buildings are now due for refurbishment and it is heartening indeed to be able to report that the Foundation has not abandoned us. Indeed quite the opposite. We recently heard the welcome news that they have agreed to donate a substantial sum of money to ensure that we can start this crucial task. To obtain such funding for a refurbishment rather than a brand-new building is quite an achievement and shows the degree of confidence the Foundation has in our present and our future.

Those of you who have been back recently may have also noticed a new addition to the north wall of Old Court, a sundial etched on Welsh slate in magnificent gold lettering, a gift to the College by an alumnus who has been extremely generous in a number of other ways. We were fortunate in that the north wall runs almost exactly east-west, giving the sundial itself the greatest possible exposure to the rays of the sun. Those of you who have not yet seen it have a treat in store. Do not, however, come and gaze at it in the hope of something as banal as telling the time; for that you should turn around and check with the clock on the tower above the Hall. As befits a College Court, this sundial is designed for other, more subtle calculations.

Richard Bowring

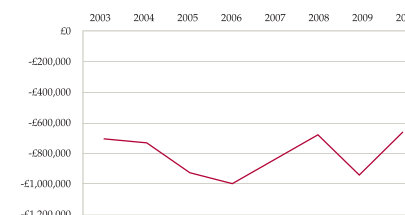
Richard Bowring | Master

Financial report

In response to continuing deficits and an increasingly hostile external environment, the College has undertaken a comprehensive review of its activities and outlook. Addressing the deficit requires a long-term strategy and a series of recommendations were agreed by the Governing Body. These included cost-cutting and careful budgeting in all areas of operation. In addition, work is beginning on a major campaign to raise £20 million to strengthen the endowment and secure the future. This will be launched in the near future, following the appointment of the new Development Director. Cost-cutting alone, though a necessary and ongoing process, will not provide the ultimate solution. It will however buy the time to put the endowment campaign in place and recent efforts have therefore focussed on cash generation and conservation.

Effective decisions and action over the past year, along with much hard work, have led to a resilient set of results. The conference business has held up well, as has the investment income following the generous decision of the Ann D Foundation to bring forward a £2.5 million donation and student numbers remain high, with a resultant positive impact on fees, rents and catering. A pay freeze has also saved a considerable sum. The College remains in deficit, but at a reduced level. In terms of the bottom line, we "only" lost £659,405, a 30% improvement on last year's loss of £938,144. Progress indeed, but still a large and unsustainable deficit.

Underlying deficit 2003-10

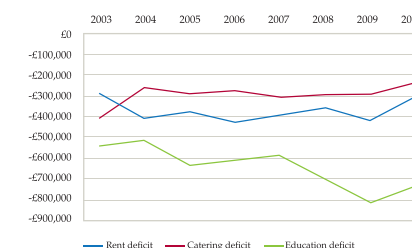


Income rose by 5.6% to £6,472,210, helped by a 9% rise in fees and a 12% rise in income from residences, catering and conferences. The corresponding increase in expenditure to £6,496,839 was restricted to 2%. Income from accommodation of College members rose by 15% to £1,567,911 as a result of strong room management and higher student numbers. The rise in related expenditure was restricted to 5%. This resulted in a 26% decrease in the deficit on the accommodation account to £305,328 from £413,623 the previous year. Income from catering for College members rose by 11% to £673,534, whilst the related expenditure remained

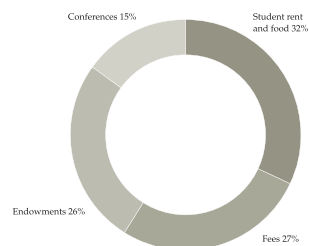
essentially unchanged. This led to a 23% reduction in the deficit on the catering account to £217,139. During the year, the College undertook an extensive review of its catering operations in order to address the deficit. A number of detailed measures relating to pricing and waste reduction are being implemented. The gap between the cost of educating our students and the associated fee income narrowed somewhat from £855,865 to £731,596, or £1,288 per capita, but remains unsustainably wide.

The College thus continues to lose money in its core businesses of educating, feeding and housing young people. Good progress was made on all fronts, but these deficits are structural and result primarily from the cost of maintaining our historic buildings. Staff costs also remain high in what remains a labour intensive operation.

Operating deficit 2003-10

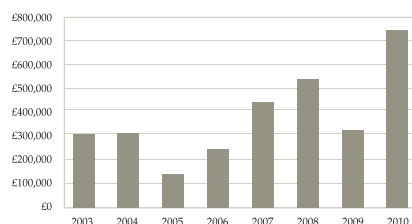


We are income constrained on three fronts: by government in respect of fees, by welfare considerations in relation to rent and food pricing, and by competition in relation to our conference business. It is thus difficult to offset the inexorable rise in costs by increasing revenues. Fees for education are now only slightly more than one-quarter of our revenues.



The College must therefore look to increase its endowment and deploy the resultant investment income towards offsetting these structural losses. On a more positive note, cost controls and a good catering and conference contribution meant that the College's cash flow has rebounded strongly to over £750,000, up from £318,000 last year.

Cash generation 2003-10



The recovery in cash flow is welcome but should not give rise to complacency. The hard work and effort spent in recent years have allowed the College to navigate several years of recession and remain with a positive cash flow. On the downside, however, the College is still not generating enough cash from its operating activities to make meaningful additions to the endowment from internal resources. Maintaining positive cash flow over the long term is a critical objective. When cash generation turns negative, the College will have to sell assets or borrow money to fund its day-to-day operations. This would certainly be imprudent.

Investments

The College's investment portfolio amounted to £25,133,328 at 30th June 2010. In performance terms, the portfolio rose by 10.5%. This, with an income return of 4.7% for the year, produced a total return of 15.2%. The College's defensive investment stance has served it well throughout the downturn and relatively high levels of

equity weighting at 71% have benefited from market recovery at a time when returns on cash are minimal.

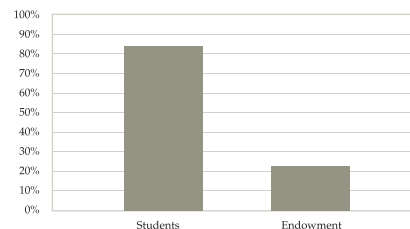
Donations

This year the College received £225,024 in unrestricted donations, which form part of Endowment Income; last year it received £263,552. In addition, the College received £3,551,968 in donations for capital purposes; last year it received £1,041,376. The response of the alumni in supporting the College is indeed very much appreciated.

Outlook

The College continues to punch above its weight. Compared to the average Cambridge college it has 90% of the numbers and barely 25% of the endowment.

Selwyn vs College average 2009



The College must now address two fundamental challenges: on the home front, the refurbishment of Cripps Court can be put off no longer and we will begin design work early in 2011. We must also react to the far-reaching changes in the funding of higher education. It is clear that the burden of funding is being transferred from the State to the individual, and this with unseemly haste. At the time of writing, the details are unclear. A likely tripling of fees from the current level will barely be enough to offset the proposed 80% cut in the HEFCE teaching grant.

Despite this fundamental disadvantage, the College is highly successful academically and remains a strikingly vibrant community. It now wishes to protect and develop these qualities and is embarking on a new and critical phase of its history, as it seeks to grow its endowment and secure its financial and academic future.

Nick Downer | Bursar

Current Research at Selwyn

In the following articles, two of Selwyn's fellows, Professor John Morrill and Professor Stewart Cant, tell us about their current research interests.



John Morrill is Professor of British and Irish History. He has been a fellow of Selwyn College since 1975 and during this time he has been a Tutor, Director of Studies, Admissions Tutor, Senior Tutor, Vice-Master and Acting Master. In this article he talks about his current research projects relating to Seventeenth-Century Britain.

Can it really be 35 years since I arrived at Selwyn and almost 25 years since I began my stint as Senior Tutor? Where have the years gone! Twice I have nearly been lured away, but happily I decided to deal with such 'push' factors as there were by changing my job description here and reinventing myself! In the most recent part of my career, I have become more and more a Research Professor, with ten to twelve graduate students at a time (at present I supervise eight PhDs and three MPhil students) and have played a leading part in designing and teaching the research-training elements of the MPhil in Early Modern History that is now the biggest such programme in the world.

And I have increasingly been drawn into commitments outside Cambridge, especially with the Arts and Humanities Research Council and in the British Academy, and as an advisor and consultant in the Higher Education world in Ireland (North and South). I am now an Honorary Member of the Royal Irish Academy. I am an unrepentant champion of collaborative research and for what might be called infrastructural projects. I was the Consultant Editor for Oxford University Press's *Dictionary of National Biography*, having overall responsibility for the 6,000 lives (six million words) of those whose 40th birthday fell (or would have fallen!) between 1600 and 1699. I was the General Editor of the Royal Historical Society Bibliography of British and Irish History and of the British Overseas (1990-9) which collated



Oliver Cromwell, painted by Samuel Cooper

and contents-indexed 249,000 titles of books, essays and articles published before 1996. This appeared on CD-ROM in 1999 and under the leadership of others contains well over 400,000 titles and is now available online. More recently I was one of four scholars (two in Dublin and one in Aberdeen making up the team) who have edited the sworn depositions of 8,000 survivors of the

series of massacres in Ireland in 1641-2, a unique and disturbing source now available (free to all) in transcription and in digitised images of the originals at www.1641.tcd.ie. I have chaired the editorial board that is producing a definitive edition of the minutes of the Westminster Assembly of 1643-52 (to many evangelicals, a body that produced documents second in importance only to the tablets of stone that Moses brought down from Sinai), and have been on the advisory boards of other major projects that are making the most important documents in British and Irish History available online. My latest project is to head up a team of eight (including Selwyn's own David Smith) to produce a five volume edition of every word Oliver Cromwell wrote or is recorded as having uttered. This edition will in due course appear in OUP's Oxford Scholarly Editions Online (on the advisory board of which I serve). All this effort has slowed down the production of monographs (if not of essays/articles: I have just reached one hundred of those!) But I am unapologetic. British history is a world leader in creating high quality and highly-searchable research tools for all scholars. I am proud to be in the forefront of this revolution.

My research interests centre around the great crisis in the islands of Britain and Ireland in the mid seventeenth century. I have made vain attempts to get away from this period, and indeed have published on every century from the sixteenth to the twentieth – most recently in work on the relations between the kingdoms and peoples of England, Ireland, Scotland and Wales in the period from 1502 to 1746 (inspired by a great New Zealand scholar trained in Cambridge who has taught for 50 years in the USA, who wrote that the peoples of these islands interacted so as to change the conditions of one another's existence); but the 1640s and 1650s have a huge magnetic pull, and I have been drawn back there time and again. I have finally written my short biography of Oliver Cromwell, and have a collection of essays about Cromwell coming out – some of them quite shocking, such as the one that interrogates what Cromwell meant when he wrote to the Speaker of the House of Commons after he has killed 3,500 soldiers and civilians in Drogheda that 'it is a righteous judgement of God upon these barbarous wretches who have imbrued their hands in so much innocent blood', or the one that looks at how and why he was sacked as Lord Lieutenant of Ireland in 1652, or quite how he read and used the Bible as a guide to public and private action (which is entitled



An image from *Tears in Ireland* (1642)

'How Oliver Cromwell Thought'). I am interested in a whole series of individuals who were driven to dramatic participation in the civil wars, like the Suffolk yeoman who went round removing all the 'monuments of idolatry and superstition' from 300 churches in Cambridgeshire and his home county and who kept a careful record of all that he did. Most recently, I have become more interested in the Catholic community of the later sixteenth and seventeenth centuries. With two very old friends, I have edited a 700-page anthology of Catholic spiritual writing in England from 1480 to the present (entitled *Firmly I Believe and Truly* and published next year by OUP as a companion to Rowan Williams' *Love's Redeeming Work*), my contribution being 150,000 words from the period down to 1700 – starting with a lovely prayer published by William Caxton in 1483, the very first religious work printed in the English language, and tracing English Catholic thought via St Thomas More and St John Fisher down through the penal times ('dungeon, fire and sword' as a great Catholic hymn has it). I am now planning more work on the experience of persecution and how the Protestant authorities faced a problem familiar to us. There were Catholic terrorists, the Pope had called on Catholics to assassinate Elizabeth I (as a heretic bastard), but most Catholics stayed loyal to the Queen. How could the authorities get at the terrorists without radicalising the moderates? Sound familiar? This, and the Cromwell edition will keep me busy into retirement in a couple of years time!



Stewart Cant is Professor of Computational Engineering. He became a fellow of Selwyn College in 1995 when he was appointed as a University Lecturer in Engineering, and he has been a Director of Studies in Engineering ever since. He was a Tutor for six years and is currently a member of College Council. His research group has its main interests in the area of computational fluid dynamics and combustion.

Energy is a topic that is never far from the public view. The global demand for energy is increasing rapidly in line with increasing global standards of living. There is growing concern about the security of energy supply, and about the local and global environmental consequences of traditional energy usage. There is lively debate about the expansion of renewable energy sources and about the renaissance of nuclear energy. Amid all the furore, it is often forgotten that about 90% of the energy used throughout the world for heating, transport and electricity generation is still produced from the combustion of fossil fuels.

Even with fairly modest improvements in the efficiency of present-day combustion systems, there is enormous potential for large-scale savings in the total quantity of fuel consumed. Since the carbon contained in the fuel is converted directly into carbon dioxide, there is equally enormous potential for large-scale reductions in greenhouse gas emissions. Combustion has been in daily use since before the dawn of civilisation, and the basic physics and chemistry of combustion is now quite well established. So what are the barriers to progress?

In practical devices such as furnaces and engines, the fuel is normally injected into a stream of air. If the fuel is not already in gaseous form, it is soon evaporated in the high temperature of the combustion chamber. The airflow is almost always turbulent, and indeed turbulence is often introduced deliberately in order to promote mixing of the fuel with the air. The actual combustion chemistry takes place mainly in the resulting gaseous fuel-air mixture. The object of the exercise is the conversion of chemical energy into large amounts of heat, which can then be used to warm a house, power an industrial process or drive an engine.

The sequence of events from injection through evaporation, mixing and chemical reaction is normally very rapid and can be made to take

place in a remarkably small space. This gives combustion systems their very high power density, and makes combustion engines essentially uncontested for transport applications. This is particularly true for aircraft propulsion, where no serious alternative to the gas turbine engine is even proposed. It is also true to a lesser extent for automotive propulsion, where the traditional reciprocating piston engine has proved tremendously robust and adaptable. These are areas where wind farms and nuclear reactors are of little value.

So the challenge is to improve the engineering of combustion systems. The difficulty lies mainly in the fluid dynamics and especially in how to manage the turbulence. The flow must carry the fuel to the right place, produce the right amount of mixing, and allow the flame to stabilise – all within the required constraints of size and weight, and preferably without melting the metal or over-stressing the structure. The real problem arises from the inconvenient truth that turbulence itself is not well understood, and its interaction with mixing and chemistry is even less so. Nevertheless the engineer cannot simply give up and choose an easier problem to solve. And this is where our work comes in.

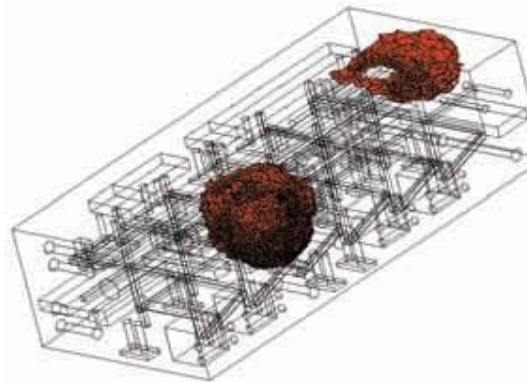
Experimental testing in combustion is done either at industrial scale with minimal instrumentation due to the hostile conditions, or at laboratory scale with state-of-the-art laser-based diagnostic equipment. Both approaches are invaluable but very expensive. Instead, we have chosen to return to the basic governing equations of turbulent reacting flow and to solve them numerically using the vast and increasing power of modern computers. Our principal approach, called Direct Numerical Simulation, requires very high accuracy in both space and time in order to achieve full resolution of all of the relevant physical and chemical phenomena. This is highly demanding in terms of computer resources, and we are major users of the largest



Direct Numerical Simulation of a flame kernel burning through a turbulent gaseous fuel-air mixture. Something very similar happens about 4000 times per minute in a typical petrol-fuelled car engine. Note the surface wrinkling which essentially determines how fast the flame can burn. With acknowledgements to Dr KW Jenkins, CUED 1996-2004.

national supercomputers as well as the University's own supercomputing facilities. One of our computer programs – called Senga - is used as a national benchmark for computational performance, and our group has held the world record for the largest-ever numerical simulation of a turbulent flame.

There is also a place for less detailed simulations in which some of the smaller-scale phenomena are not fully resolved and so must be represented using mathematical models. This approach is much less demanding in computational terms, and has become standard practice in industry where the emphasis is on fast turnaround in order to support the industrial design process. There is however a requirement for accurate modelling of the unresolved physics and chemistry. Here, we are able to assist by using data from our fully-resolved simulations to develop and calibrate new models for the effects of small-scale mixing and reaction or fuel droplet break-up and evaporation. At present, one of the most important application areas is gas turbine combustion for both aircraft propulsion and land-based power generation. Another important area is the safe production, processing and storage of fuels, in which we have worked closely with the petrochemical industry to build simulation tools for improved process



Industrial-scale simulation of an explosion developing from two ignition points in a single module of a petrochemical processing plant following an accidental release of natural gas. The actual module was 20 metres long, 12 metres wide and 8 metres high, and was repeatedly blown up on a test range in Cumbria. With acknowledgements to Dr D Baraldi (SE 1997) and CUED.

plant design in order to mitigate the consequences of accidental explosions.

Currently, the research group in the Department of Engineering consists of five PhD students together with a postdoctoral Research Assistant, all working on various aspects of combustion simulation and modelling. We work closely with members of the Computational Fluid Dynamics Laboratory on numerical methods, the Cambridge Combustion Research Centre on applications to practical combustion systems and the Acoustics Laboratory on acoustically-coupled instabilities of flames. Funding for group members comes from a variety of sources, including Rolls-Royce and Mitsubishi as well as the US Air Force and the Malaysian Government, and we have a long-running international collaboration with Sandia National Laboratories in the USA.

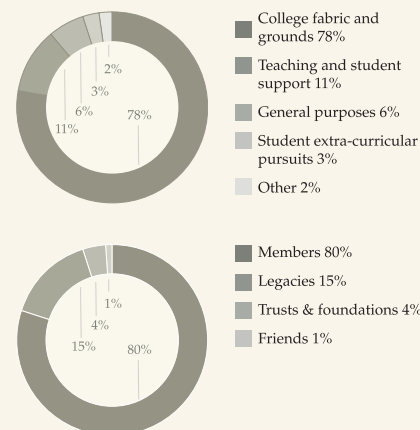
A great deal of research remains to be done, but there are excellent prospects for future progress. Available computer power is continuing to increase, albeit a little more slowly than in the recent past, and more of the complexity of combustion is being understood. Above all, there is no shortage of motivation to help find practical engineering solutions to some of the world's most pressing problems.

Development and alumni relations

The College's development and alumni relations programmes are designed to strengthen the College's relationship with members and friends through a range of communications and events, and to provide financial support for the educational aims of the College through fundraising activities. As in previous years, members have been generous in both their attendance at events and through their donations.

Gifts Received 1 July 2009 – 30 June 2010

A total of £3,776,992 was received during the financial year.



Value added giving

For many donors, there are a variety of ways to make a donation which enhance the basic value of a gift. Here are some which you may wish to consider to make your money go further.

The Government matched funding scheme for donations to English universities

Collegiate Cambridge has welcomed the UK Government's matched funding scheme, the principal aim of which is to encourage new donors to make philanthropic gifts to English universities. Oxford and Cambridge have agreed with the Government that they will use the scheme to encourage greater participation by alumni and other supporters. The Government has set a cap of £2.75 million on the funds for Cambridge in aggregate over the three years 2008/09 to 2010/11. In order to achieve this goal the colleges and the University will have to demonstrate that they have received in cash at least £8.25 million (including Gift Aid) from 'new' donors over the three year period be they individuals, companies, trusts or foundations in the UK or overseas (for the purposes of this scheme, a new donor is

somebody who has not made a gift to a college or the University since 2005).

It has been agreed that the funding will be divided between the colleges collectively and the University in the same ratio as the qualifying donations. For example, if the colleges collectively raise two-thirds of the qualifying donations the colleges collectively will receive two-thirds of the matched funding.

Payroll giving

This is a means of making a donation directly from your salary before income tax is calculated and deducted. If you are a basic rate taxpayer a monthly gift of £5.00 to Selwyn would cost you only £3.90. The UK Government wishes to encourage payroll giving and will top up your donation by 10%. This would mean that your donation would be worth £5.50 to the College.

Please contact your own payroll office to enquire whether they participate in payroll giving.

Matched giving

There are a large number of companies offering 'Matched Giving' schemes to their employees, which mean that when you give to a registered charity they may match in full, in part or even at more than 100% at no additional cost to the giver. Please check with your Human Resources Department to see if your company participates in a matched giving programme. Among the many companies which offer this option are the Bank of England, J P Morgan, Marks & Spencer, BAA, Ford Motor Company, BP, Vodafone, BT, Deloitte, KPMG, Ernst & Young and Shell.

Amazon.co.uk

Many of our members and friends are regular shoppers on the internet, and by accessing the Amazon.co.uk website through the icon link on the College's own website (sel.cam.ac.uk/alumni), 5% of the value of any purchase made is automatically given to the College. Since its launch, this scheme has now begun to provide a modest, regular monthly income to the College at no cost whatever to you.



Selwyn College Cambridge

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Selwyn College Cambridge | Tel: +44 (0)1223 767844
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