



General Council Meeting of 11 February 2012: Annex to Billet

THE GENERAL COUNCIL OF THE UNIVERSITY OF EDINBURGH

Contents	Page
Papers for the General Council Meeting on 11 February 2012	
1 Formal communications from the University Court	2
2 Report of the Academic Standing Committee	2
3 Report of the Constitutional Standing Committee	4
4 Report of the Finance and Services Standing Committee	5
5 Report of the Public Affairs Standing Committee	7
6 Meetings of the Business Committee	7
7 Deaths of members of the General Council	8
Papers from the General Council Meeting on 12 June 2010	
A Presentation by Professor Steve McLaughlin, Dean of Research, College of Science & Engineering	15
B Presentation by Professor Simon Bates, Dean of Learning and Teaching, College of Science & Engineering	20
C Presentation of the Report of the Business Committee	28
D Questions and Answers	29

Papers for the General Council Meeting on 11 February 2012

1 Formal communications from the University Court

The following Draft Resolutions have been received:

47/2011	Foundation of a Chair of Astrobiology
48/2011	Foundation of a Chair of Islamic and Inter-Religious Studies
49/2011	Foundation of a Chair of International Banking Law and Financial Regulation
50/2011	Foundation of a Personal Chair of Cultural History
51/2011	Alteration of the title of the Chair of Veterinary Immunology
1/2012	Foundation of a Personal Chair of International Health and Molecular Medicine
2/2012	Foundation of a Personal Chair of Politics and International Relations

2 Report of the Academic Standing Committee

for the General Council Meeting on 11 February 2012

Convener of the Academic Standing Committee: Professor Ian Sutherland

The Academic Standing Committee has met twice since reporting to the last Half-Yearly Meeting of the General Council on 18 June 2011. The aim of the meetings with University Staff was to learn more about 'The Student Experience'.

On Thursday 12 May 2011, it welcomed Revd Dr Harriet Harris, University Chaplain, Dr MaryCatherine Burgess, Associate Chaplain, and Mr Ronnie Millar, Director of Student Counselling Services.

Dr Harris said that the Chaplaincy had a multi-faith and multi-belief team which provided support for students and staff. They could offer one to one and emergency support. Events were also an important part of their activities; this year they had concentrated on events bringing students together. The Centre also accommodated religious and humanist societies and an important part of their remit was participation in ceremonies and services. The Bristo Square site provided 'Drop-in Space' and meeting rooms, which could be booked by students. During the semesters, these were fully booked by student societies. A small chapel was used for services and as a contemplation room. During the day the Drop-in Space was well used in lunch-times. Exhibitions were sometimes held there and they were consulting with Edinburgh College of Art to see what they could exhibit. There was enough space to hold large events. The Chaplaincy Centre was very popular and 2,500 people passed through its doors each week. Figures for users of the other campuses were not available. The King's Buildings Chaplaincy Centre was well-used and they also had rooms at Moray House and the Veterinary School. It was a challenge to provide support across all the sites. They had two full-time Chaplains and administrative staff, together with a large team of Associate Chaplains of many different religions, however the time they were able to devote to the Centre was dependent on their other commitments.

Dr Burgess had worked at the University for seven years. She had enjoyed the multi-faith issue; students wanting to know about other people's religions. This year they had a multi-faith event co-hosted by people of various religions. There were a growing number of students who were interested in working together. One of the things they had done over the years was to invite members of the Counselling Services so that they could promote one another. It had been a helpful way of clarifying roles. Dr Burgess then reminded members that

some time previously a documentary film had been made by students and staff from the University of Edinburgh about developing a multi-faith Chaplaincy.

The Committee was impressed by the amount of work they achieved with such a small team and asked whether the University provided sufficient support for that work and whether there were adequate networks of support. Dr Harris said that sometimes it was difficult to know what was going on elsewhere. She was of course new to the University, but felt that communication was a challenge; public emails were not possible, posters were not effective. Mr Ronnie Millar said that they had a lot of contact with DoSs and other staff who approached them and had done as much as they could, and that contact was welcomed. Dr Burgess said that the question was how those who offered support could support each other and she felt that the understanding of the Chaplaincy had grown beyond traditional Christianity. Mr Miller said that he had had a lot of support from the University, but in order to meet some of the challenges that had been mentioned it would be necessary to cut through the system. He was not sure how well communications worked and they were not easy to maintain. He felt that more could be done. Concern was raised about the support available for postgraduate students and Dr Harris said that they were very aware of the problems of postgraduates and had developed networks and events. Through hosting religious societies they came into regular contact with many postgraduates. The contact with students of other faiths, and how they knew that this was a place that they could go to might have been a problem. Dr Burgess said students were aware that it was an alcohol-free space and she pointed out that two years previously EUSA had introduced a coffee bar to provide a non-alcoholic venue where students could meet and stay until late. It was asked whether the space and staff were sufficient to cope with the increasing numbers of students. Dr Harris responded that they had only a small staff, 3.65 full-time equivalent posts shared between five people. Everyone was very conscientious and there was a lot of goodwill to make it work, but a larger team would be able to integrate what goes on, the building was fully booked so there is no flexibility, there was a space issue.

Mr Ronnie Millar, Director of the Student Counselling Service said his team comprised professional counsellors and psychotherapists and an experienced frontline team. They would be moving to new premises in the Main Library and had rooms in Moray House and King's Buildings, and a pilot project at Easter Bush. They had eighteen counsellors amounting to about 5.5 full-time equivalent staff. Their service was British Association for Counselling and Psychotherapy (BACP) accredited, a bench mark of quality and professionalism, and was the only university service in Scotland with that. The Service was established in 1970; until 1980 counselling and welfare were combined. The Advice Place established by EUSA dealt with welfare, leaving them to focus on counselling offering a free, confidential service to students (including the Scottish Agricultural College). Recently they had had to assess what they did and how they could meet demands. They introduced short-term counselling of up to six sessions, but were unable to offer long-term counselling; anyone needing this had to seek it elsewhere. They also provided email counselling, Cognitive Behaviour Therapy (CBT), hypnotherapy and bibliotherapy (available in the Library and well-used). They also offered group therapy and workshops. Many students who approached them did not need counselling. They also offered staff consultations and staff training and frequently received phone calls from staff with concerns about students, but mostly they were able to tell them to continue with what they were doing. Their role was to enhance the student experience by helping them to maximise their effectiveness and to help them with mental health problems. Some were brought with them, others developed while they were students. Feedback suggested that students liked the atmosphere that they had created. Issues which students presented with included anxiety, depression, relationship problems, academic problems, loss, transition, abuse and eating disorders. Pressure on the service had increased over the years. Over ten years the number had doubled. Most students found their way to the service via the website; others came through their school or other student services, via the University Health Centre or through friends. They did not approach students who had been referred by a third party, as 90% of the time such students would not turn up for a meeting. Once a student contacted them they would complete a registration form and questionnaire asking them what they were experiencing, and they would then be offered an initial appointment to determine whether short-term counselling was appropriate or if their problem would be better dealt with elsewhere. Most did receive short-term counselling. Students were referred to other organisations, or to the Disability Office, Chaplaincy or Medical Centre if appropriate. The Service also offered workshops to help students cope with such problems as procrastination, run in conjunction the Centre for Teaching and Learning; stress and relaxation; dyslexia, run with the Disability Office; and workshops for PhD Students. For the last three years they had run a group for the depressed.

They also provided advanced level training for Directors of Studies (DoS); the re-introduced inductions for DoS were well-attended. They maintained close relationships with the University Health Service, Accommodation Services, the Disability Office and the Students' Association. They offered staff consultation and training and were planning to roll out mental health awareness training. The service was evaluated using the Clinical Outcomes for Routine Evaluation (CORE) System, which was used widely in the National Health Services (NHS). The results showed that 79% of students seeking help were in significant psychological distress, 75% showed statistically reliable improvement in their condition and according to last year's Student survey 95% reported that counselling had a beneficial effect on their academic performance. Feedback indicated that for many students it was their first experience of counselling and most found that short-term counselling met their needs. Mr Millar said that they saw themselves as an important part of the University community. Their Annual Report had just been published and copies were available for members to take away with them.

It was questioned why Counselling was separate from Welfare Services, as there must be a large over-lap, but Mr Millar said that historically the move to separate the two had been instigated by the EUSA, as they were increasingly involved in providing financial advice and advocacy, with counselling increasingly sought elsewhere. They made it quite clear that they offered psychological counselling and redirected students to other services if that was more appropriate. The Counselling Service and other welfare services had links to each other's websites to enable students to access the appropriate service. When asked whether there was sufficient interaction between the various services Mr Millar said that their move to the Main Library would allow the services to be more accessible and in preparing for the move there had been a lot of co-operation, they had always been very close physically. However, there were some problems associated with being too close together as students were concerned about visibility. Mr Miller said that they were going to maintain a presence at other sites, so that people not wishing to go to the Library could go to these. All teams would be training their receptionists very thoroughly to help students, in order to alleviate any concerns. As to whether the location was good or bad, Mr Millar said that it had advantages and disadvantages. They were not well-publicised at the moment, but if demand rose they would have difficulty meeting it. It was also possible that some students might find the Library a stressful place, so only time would tell. There was interest in how the services were configured, with limits set around demand, and whether with resources becoming scarcer the balance between one to one and group activities might have to be reconsidered. Mr Millar said that in the short-term they had been able to cope, but had to prioritise. Waiting times had previously been cut dramatically, but since then resources had been diminishing and demand increasing. They used to run more extensive workshops but had had to curtail them. Most students wanted one to one counselling, but some workshops could be used for students while they were waiting. They had changed the management structure last year and might have to consider trying what some universities in England are doing, where students might benefit from fewer sessions. Currently the longest students had to wait, without any other complications, was ten weeks. In discussion with the committee Mr Millar said that not only had the numbers increased but also the complexity of the problems presented. This was a reflection of what was happening in society as a whole. The University was taking on board that student services were under-resourced compared with the Russell Group.

At a meeting on 10 November the Committee planned its programme for the current session.

3 Report of the Constitutional Standing Committee

for the General Council Meeting on 11 February 2012

Convener of the Constitutional Standing Committee: Mr Bruce Rae

The Constitutional Standing Committee has met once since reporting to the last Half-Yearly Meeting of the General Council on 18 June 2011. Topics covered were:

1. The Introduction of Online Voting for General Council Elections
2. The completion, revision, and proposal to submit to the General Council for approval the following two documents:

- a) The General Council of the University of Edinburgh: Regulations for General Council Elections and
- b) Constitutional Arrangements for the working of the University of Edinburgh and its Business Committee

The Convener was asked to prepare a Motion to this effect and this was duly done and presented to the Business Committee for approval at its meeting on 6 October 2011. Having received the approval of the Business Committee, the Motion is hereby submitted to General Council for approval and adoption at the Meeting of the general Council on 11 February 2012.

In addition, it should be noted that a Business Effectiveness Review Group has been set up with the following remit:

- To determine how effectively the Business Committee fulfils the statutory roles and responsibilities of the General Council
- To examine the principal working practices and procedures of the Business Committee and
- To review how effectively the Business Committee communicates with the General Council and other stakeholders.

The Interim Report of this Review Group was disseminated to the Business Committee and discussed at its meeting dated 20 December 2011, and the Constitutional Standing Committee will be considering this Interim Report to see what areas could usefully form the basis for discussion and possible action by them.

4 Report of the Finance and Services Standing Committee

for the General Council Meeting on 11 February 2012

Convener of the Finance and Services Standing Committee: Ms Doreen Davidson

The Finance and Services Standing Committee has met three times since last reporting to the General Council on 18 June 2011.

At its meeting on **23 June 2011**, the committee received an informative presentation from Mr Angus Currie, Director of Estates and Buildings. He provided a comprehensive overview of the sustainable development of the estate, including the financial implications of this. The University's estate was very significant and covered areas throughout the city centre, the Western General Hospital, Pollock Halls, Little France, Easter Bush and the King's Buildings. This was the largest estate in the Higher Education sector after Cambridge and Manchester. One of the key challenges was, therefore, the ongoing overheads in maintaining such a large and diverse estate. There were, however, benefits in the size and diversity of the estate – for example it permitted decanting between buildings to facilitate major redevelopment whilst sustaining income growth and maintaining acceptable conditions for staff and students. In order to control costs, schools were encouraged to be very aware of the cost of space and were charged if they used more than was allocated and rewarded if they used less. A UK wide space management group had been working with the sector and advisors to produce a tool kit and a model to promote good practice sector-wide.

Mr Currie also presented information on the Quality Infrastructure: Estate Strategy for 2010-2020. The University owned over 200 buildings, excluding residential estate. 6,000 beds were under direct management and the residential estate was in good condition, which was very important for the student experience. His department employed over 700 staff and to ensure efficient management of the estate, it had been split into four zones (the Edinburgh College of Art formed part of an extended Central Area). Recent projects had included the new Business School in the former Adam Ferguson Building, which included an extra floor and a new entrance on Buccleuch Place. The largest most recent project was the refurbishment of

the Main Library where spaces were being developed for more flexible use. Mr Currie explained that a detailed feasibility study and space analysis was conducted for each project.

Other key plans included:

- Development of parts of the old Moray House for student residential accommodation (to provide ca 1200 postgraduate bed spaces)
- The development of High School Yards to accommodate the new Climate Change Centre, for which planning consent and a significant funding contribution was in place.

Mr Currie acknowledged that the University was interested in the utilization of spaces between buildings as well as the buildings themselves and in the central area and King's Buildings his team was working in accordance with public realm strategies endorsed by the City Council. The work on the Main Library and former Adam Ferguson Building had allowed development of South George Square and a donor had recently been found to fund work on the Old Quad (which was now complete). There was also a plan in place to improve signage in the central area.

At King's Buildings the successful part refurbishment of the James Clerk Maxwell Building had been completed and a new library was under construction, which would provide a much more flexible mix of space. In addition, £6m had been secured from a research council to build a large wave tank on the site of the Ogston Building, which had been vacated as a result of the merger with the Roslin Institute.

Easter Bush was now the home of the new Veterinary School and the Roslin Institute had relocated to its new building in March. At Little France the Clinical Research Imaging Centre (CRIC) would now bring NHS patients in to use University facilities for the first time.

The next meeting of the Committee took place on **25 October 2011**. The main item for consideration at this meeting was to agree the plan of meetings for the year ahead. After some discussion, it was agreed that the committee should invite the Director of Finance, the Director of Human Resources, Vice Principal Knowledge Management, & Chief Information Officer as well as the Director of D&A (Development & Alumni).

Another important topic at this meeting was the review of the General Council budget for 2011-2012. The Secretary noted that this had been reduced by 5% in line with the strategy for other university costs and expenditure and believed that this figure was sustainable for the current year. As in previous years, a significant proportion of the funding would be passed on to Communications & Marketing (C&M) for the production and distribution of *Billet* within *Edit*, which was a very important communication tool for Alumni worldwide.

The next meeting of the Committee was held on **24 November 2011** at which a highly informative presentation was given by Professor Jeff Haywood, Vice Principal Knowledge Management and Chief Information Officer

The discussion focused on technology in learning and teaching in the 21st Century in terms of current and future strategy. The general view was that over the next decade learning and teaching would inevitably involve increased use of technology. He noted, however, that students' expectations were not as high as might be expected since they were relatively conservative about education, with some students expressing surprise about how much technology was involved in University teaching. There were, therefore, very differing levels of competence, especially if this included adult learners. Research had shown that it was therefore necessary to accommodate everyone's styles and levels of competency as far as possible.

Technology also had a useful role in supporting 'internationalisation' both through distance learning and for staff on placements in alternative locations. Some examples of the use of technology within Schools included:

- virtual environments

- online assessment
- lecture capture
- collaborative projects
- discussion forums or podcasts and e-profiles

Professor Haywood provided some background on The Institute for Academic Development which was established in January 2010. This entity brought together central support for academic development and study skills to help Schools around the University to improve the skills and knowledge acquisition of their staff and students, which provided a very useful service.

E-assessment was an area that the University would like to make progress in and some pilot work had been undertaken by the University on this issue. In addition, high-tech study and teaching spaces were being developed and e-Learning Practitioners were collaborating to share ideas and have face to face discussions.

Professor Haywood also provided some information on the Distance Education Initiative (DEI), a University-wide project to substantially increase on-line distance learning at postgraduate level over the next ten years. This included hybrid programmes, i.e. part on- and part off-campus arrangements.

5 Report of the Public Affairs Standing Committee

for the General Council Meeting on 11 February 2012

Convener of the Public Affairs Standing Committee: Mr Neil Hynd

The Public Affairs Standing Committee has met twice since the last reporting to the General Council on 18 June 2011.

The Committee has considered the result of a scoping study submitted to it on the subject of the preparation of a Historic Alumni Research Resource. This was instigated by Mr Peter Freshwater, ex-Convener of the Business Committee, as one of the initiatives proposed by the General Council as part of its 150th Anniversary. It was proposed that the research was carried out in three phases and that external funding would be needed to conclude the project. The committee agreed to report back to the Business Committee that they felt that the project was worth supporting, but only if all three phases of the project could be funded. Although raising funds was currently more difficult, it was felt that a lot of use might be made of the archive by those researching their family history, and that the project might well appeal to an individual sponsor. Costs could possibly be reduced by using the online facilities of “Scotland’s People” and some of the work might be attractive as a post-graduate student project.

The idea of a General Council Newsletter was discussed and generally agreed as a good development which would help the General Council to raise its profile amongst its members. It would supplement, not supersede, the *Billet* within *Edit*. Three publications a year were suggested and would be sent to members by email, in a similar way to other university newsletters; development of this idea was underway in consultation with colleagues in “Development & Alumni”.

In my last report it was stated that deliberations were underway for the next overseas meeting of the General Council in June 2012 to be held in Brussels. Due to one or two insuperable problems which arose during the initial planning stage, it has now been agreed that the meeting should take place in Berlin, and plans are now being taken forward on that basis for 16 June 2012.

6 Meetings of the Business Committee

The Committee has met four times since its last Report was printed, viz. 12 July 2011, 6 October 2011, 20 December 2011 and 26 January 2012.

7 Deaths of Members of the General Council

The deaths of the following members of the General Council have been reported during the year from January 2011 to January 2012. Names have been listed by year of first graduation from the University of Edinburgh.

McKenzie-Newton, Elizabet Brownlie, MA of 1915, died 05/03/2011

Hutt, Frederick Bruce, PhD of 1929, died 2011

Brown, Simona (née Mackay), MA of 1933, died 2011

Dykes, Margaret Elizabeth (née Strachan), MA of 1933, died 16/06/2011

Normand, Richard John, MA of 1933, LLB of 1935, died 2011

Milne, Mary Ralston McColm (née Mundell), MA of 1934, died 28/5/2007

Curtis, William Edgar, BMus of 1935, MA of 1936, died 23/10/2011

Grant, David, BSc of 1935, died 2011

Stewart, Mairi Ross (née Nicolson), MA of 1935, died 18/09/2011

Walker, Grace Brownlee (née Torrance), MA of 1935, died 12/06/2011

Gilliland, Jean Katharine (née Matthew), BCom of 1936, died 2010

Mackenzie, George Kenneth, MBChB of 1936, MD of 1951, died 2011

McLellan, Kenneth Archibald, MA of 1936, LLB of 1938, died 2010

Craig, William Nicholas, BSc of 1937, died 2011

Soutter, John Forrest, MA of 1937, died 2011

Tulloch, Nina Alexander Bernard (née Verity), MBChB of 1937, died 29/06/2011

Watt, Jean Macdonald (née Donaldson), MA of 1937, PhD of 1939, died 2011

Cooper, Jessie Ross McCutcheon (née Fulton), MBChB of 1938, died 26/04/2011

Goudy, Robert George, MA of 1938, LLB of 1940, died 09/03/2011

Rose, Elizabeth Margaret, MBChB of 1938, died 01/04/2011

Galloway, William Hugh, MBChB of 1939, MD of 1964, died 2011

Stevenson, Betty May Bewglass (née Taylor), MA of 1939, died 2010

Finlay, Harry Variot Langwill, MBChB of 1940, died 2011

Fleming, John Bryden, MA of 1940, died 2011

Glass, Leslie Stuart, MBChB of 1940, MD of 1947, died 2011

Gordon, Neil Simson, MBChB of 1940, died 2011

Godfrey, Ivan Chandra, MBChB of 1941, died 12/04/2011

Gregson, Ernest Renaud Lewtas, MBChB of 1941, died 2010

Davies, Marian Elizabeth, BSc of 1942, died 29/07/2011

Maclean, Donald Grant, MBChB of 1942, died 2010

McCallum, Donald Murdo, BSc of 1942, died 18/10/2011

Mitchell, Elizabeth (née McKenzie-Newton), MBChB of 1942, died 05/03/2011

Tulloch, Alister Peter, BSc of 1942, died 2010

Brian, Eileen Louise Pitt (née Watson), MA of 1943, died 2011

Bryson, Dorothy Shaw Turner (née Bell), BSc of 1943, died 2011

Collie-Kolibabka, Gertruda Anna (née Kuklinska), MA of 1943, MBChB of 1949, died 2011

Donaldson, Robert Livingstone, BSc of 1943, died 2011

Drew, George Reuben Hughes, MBChB of 1943, died 2011

Johnson, John Cunningham, MBChB of 1943, died 13/07/2011

Dobson, James, PhD of 1944, died 2011
Donoghue, Clara Gordon Thomson (née Scott), BSc of 1944, died 2010
McDiarmid, Archibald, PhD of 1944, DSc of 1953, died 2011
McNaught, Gordon Herbert Dargavel, MBChB of 1944, died 31/10/2011
Proudfoot, James Ledingham, MA of 1944, died 05/04/2011
Smith, Margaret Marshall (née Garft), MA of 1944, died 2010
Swan, Harold Thomas, MBChB of 1944, MD of 1961, died 18/06/2011

Anthony, Thomas Burns, MBChB of 1945, died 2011
Ellison, David John, MBChB of 1945, MD of 1975, died 17/02/2011
Winning, William Ian Hay, BSc of 1945, PhD of 1947, died 30/08/2011

Bennett, Daisy Beryl (née Russell), MA of 1946, BD of 1948, died 25/05/2011
Clayton, Barbara Evelyn (née Clayton), MBChB of 1946, PhD of 1949, died 11/01/2011
Hallifax, Elizabeth Stewart (née Humble), MBChB of 1946, died 2011
Hogarth, George, MA of 1946, died 23/08/2011
Lonie, William, BSc of 1946, died 2011
Reid, Alexander, MBChB of 1946, died 2010
Scott, Richard, BSc of 1946, died 2011

Banks, Peter Neil, BSc of 1947, died 2011
Brown, David Robert Caldwell, MA of 1947, died 2011
Carmichael, Elizabeth, MA of 1947, died 2011
McGillivray, James Murray, MBChB of 1947, died 2010
Runcie, Kenneth Victor, BSc of 1947, died 2011
Scott, Andrew Fraser, BSc of 1947, died 2010
Tait, Andrew Wilson, MA of 1947, died 13/03/2011
Taylor, Norval Richard William, MBChB of 1947, died 01/09/2011

Berryman, Peggy Irene Annie Joy, MA of 1948, died 2011
Boldy, Jean Alison Renwick (née Wilkie), MBChB of 1948, died 2011
Care, Mary Isabel Boyd (née Campbell), MA of 1948, died 15/02/2011
Galt, Robert William Cuthill, BSc of 1948, died 08/01/2011
Hamerski, Henryk, MBChB of 1948, died 14/08/2011
Klein, Maria (née Lifszyc), BSc of 1948, died 28/08/2011
Little, John, BSc of 1948, died 12/02/2011
McLeod, William Taylor, MA of 1948, died 21/03/2011
Mills, Michael Ward, MBChB of 1948, died 2010
Napier, Isabella Ross, MBChB of 1948, died 04/05/2011
Spencer, Ronald Cameron, MA of 1948, died 2011
Stewart, Margaret Ann, (née Stewart), BSc of 1948, died 13/09/2011
Whitaker, Robert H, PhD of 1948, died 2011
Winchester, Patrick Logie, BSc of 1948, died 2011
Woods, Mary Alison (née Clapperton), MA of 1948, died 2011

Bendkowski, Boleslaw, MBChB of 1949, MD of 1960, died 2011
Borrowman, Philip Ronald, BSc of 1949, died 16/06/2011
Calvert, Harold, BD of 1949, died 2011
Cattanach, Angus Macintyre, MA of 1949, died 2011
Cubie, Margaret Shaw (née McGhee), MA of 1949, died 30/05/2011
Davies, Barbara Mary (née James), MA of 1949, died 2010
Dean, Sheila Margaret (née Stewart), MBChB of 1949, died 2011
Dorward, Frank Scougal, BSc of 1949, died 06/05/2011
Goorney, Anthony Bryan, BSc of 1949, MBChB of 1950, died 2010
Greig, James Henry, MBChB of 1949, died 15/02/2011
Ingram, Ronald, MA of 1949, died 2011

Kinroy, John Neil, MA of 1949, died 16/05/2011
Lammie, George Alexander, BSc of 1949, died 08/08/2011
McDonald, Ian, MA of 1949, died 2011
Merson, Ronald David, MBChB of 1949, died 2011
Paul, Iain, BSc of 1949, died 2011
Simpson, Ian Macdonald, MBChB of 1949, died 2011
Spoor, Leslie, MA of 1949, died 13/03/2011

Cabral, Jeanie Reid (née Irvine), MA of 1950, died 2010
Gellatly, James Brown Morton, BSc of 1950, died 2011
Graham, Robert Dickson, BSc of 1950, died 2010
Hall, George Kenneth Macdonald, MBChB of 1950, died 24/08/2011
Ker, Denis Stuart Scott, MBChB of 1950, died 2011
Kerr, Philip James, MA of 1950, died 2010
McCall, Hugh Gordon, MA of 1950, died 2010
Parry, Agnes Cormack (née Love), MA of 1950, died 26/04/2011
Pye, James, BSc of 1950, died 2011
Reid, George Colvin, BSc of 1950, died 2011

Brackenridge, Robert Glen, MBChB of 1951, died 2011
Drew, John Francis, BSc of 1951, died 2011
Hancock, Philip David, MA of 1951, died 28/06/2011
Kirkland, William Matthews, PhD of 1951, died 20/04/2011
Milne, Alexander, BSc of 1951, died 2011
Myles, William George Harris, BCom of 1951, MA of died 09/01/2011
Paton, Alan McEwan, BSc of 1951, PhD of 1956, died 2011
Patterson, John Stitt, MBChB of 1951, died 2011
Snell, Francis William Gilbert, MBChB of 1951, died 20/01/2011
Sutherland, Anne Bryson, MBChB of 1951, MD of 1958, died 2011
Symons, John Henry, MA of 1951, died 2011

Donaldson, Jean Margaret, MA of 1952, died 12/07/2011
Mahaffy, Ronald Gibson, MBChB of 1952, died 22/08/2011
Morgan, William Howell, MBChB of 1952, died 2011
Nairn, Ainslie James William, BL of 1952, died 2011
Porteous, Ian Robertson, MA of 1952, died 30/01/2011
Wallace, George Scott, MBChB of 1952, died 2011

Browne, Michael Walter, BSc of 1953, died 13/02/2011
Dunlop, Dorothy Margaret (née Glennie), MA of 1953, died 2011
Fulton, Anne Catherine (née Tait), BL of 1953, died 2011
Gray, John Ferguson, MA of 1953, died 2011
Harvey, Harriet Riggall (née Mitchell), MBChB of 1953, died 2011
Hooton, David John, PhD of 1953, died 2011
Mackenzie, John Leonard Duncan, MA of 1953, died 08/06/2011
Sellers, Robert Firth, BSc of 1953, PhD of 1959, died 25/06/2011

Brown, George, BL of 1954, died 2011
Brush, Michael George, BSc of 1954, died 2011
Hughes, Edward, MA of 1954, died 2011
Riley, John Lawson, MBChB of 1954, died 2011
Shepherd, John Steven, MBChB of 1954, died 14/10/2011
Whiston, Herbert George, MBChB of 1954, died 2011

Bewley, Donald Robert, BEd of 1955, MEd of 1966, died 2011
Carrol, Reynold Oshowole Williamson, BDS of 1955, died 27/09/2011

Cuthbert, Arthur Alexander, BSc of 1955, died 2011
Gillies, Patrick John, MBChB of 1955, died 24/02/2011
Hay, Thomas Kerr, MBChB of 1955, died 21/01/2011
Smart, James Alan, MA of 1955, Dip of 1956, died 21/01/2011
Stewart, Jean Ceilia, BSc of 1955, died 2011

Anderson, Margaret Violet, MA of 1956, died 2010
Broadfoot, William, BSc of 1956, died 23/08/2011
Croll, Charles, MBChB of 1956, died 02/01/2011
Massingberd-Mundy, Ann Maureen (née Lowry), MA of 1956, died 2011
Tordoff, David Bertram, BSc of 1956, died 2011
Walker, Catherine Doreen (née Cumming), MA of 1956, died 08/07/2011

Bond, Mary (née Galitzine), MA of 1957, died 2011
Cruikshank, Arthur Richard Ivor, BSc of 1957, 1958, died 04/12/2011
Halpin, Kenneth Drummond, MBChB of 1957, died 2011

Hunter, William Taylor, MBChB of 1957, died 2011
Salzberger, Ruth Caro, MA of 1957, died 2011

Eglinton, Beryl Eva, MA of 1958, died 03/03/2011
Lawrie, David Alan, BDS of 1958, died 2011

Fleming, Archibald Macdonald, BCom of 1959, MA of died 10/11/2011
Morton, Robert Colin Maxwell, BD of 1959, died 16/06/2011
Watson, Sheila Sanderson, MA of 1959, died 24/06/2011
Wylie, John Victor Crawford, MA of 1959, died 2011

Harcourt, Ralph Alexander, BVMS of 1960, died 2010
Tellis, Michael McDonald, MBChB of 1960, died 24/05/2011
Turner, David John, MBChB of 1960, died 26/08/2011

Caldwell, Hugh Archibald, BSc of 1961, died 2010
Hogg, Ian Alisdair Lawrence, MA of 1961, died 31/01/2011
Hunter, Kenena Joan (née Maciver), MA of 1961, died 2010
Mason, John Muir, BL of 1961, died 22/01/2011
McFarlane, Hylton, PhD of 1961, died 2011
Swift, Robert Burgoyne, MA of 1961, died 2011

Barnes, Elizabeth Mary (née Carmichael), MA of 1962, died 2011
Mills, Alfred Raymond, PhD of 1962, died 2011
Paton, Gordon Alexander Johnson, MA of 1962, died 2011

Egan, Katherine, M A (née Winter), UgCert of 1963, died 01/11/2011
Gibbons, Robert William, BVMS of 1963, died 2011
MacGillp, Alexander Lister, MA of 1963, died 2011
McInnes, John Colin, LLB of 1963, died 12/10/2011
Rankin, Kenneth Cunningham, MBChB of 1963, died 03/07/2011

Fawcitt, Alison Mary (née Brunton), MA of 1964, Dip of 1965, died 2011
Foster, Peter David, BVMS of 1964, MSc of 1974, died 2011
Locherbie-Cameron, Margaret Ann Locherbie, MA of 1964, died 2011
MacAllan, Georgina Duncan, MA of 1964, died 31/05/2011
Perkins, Stephen Lindsay, BSc of 1964, died 2011
Wood, Sheila McIntosh (née Ross), MA of 1964, died 16/06/2011

Campbell, Allan Edwin Charles, MA of 1965, LLB of 1967, died 2011
Olive, Paul Anthony, MA of 1965, died 2011
Plews, Rhona Margaret, BSc of 1965, died 17/06/2011
Skerrett, Raymond John, BSc of 1965, PhD of 1969, died 2010

Barrett, Philip Roderick Francombe, BSc of 1966, died 2011
Brown, Peter, BSc of 1966, died 2011
Davies, Dafydd Hywel, BVMS of 1966, died 2011
Forrest, John Arthur Hunter, BSc of 1966, MBChB of 1969, died 2011
Malcolm, David Brown, BSc of 1966, PhD of 1970, died 21/07/2011
McMath, Robert Keith, BDS of 1966, died 2011
Thomas, Harold Richard, MBChB of 1966, died 07/04/2011

Easy, William Richard, BSc of 1967, MBChB of 1970, died 2010
Neill, Robert Alan, BSc of 1967, died 06/03/2011
Pollard, George Christian Scott, BSc of 1967, died 2010
Rowe, Melvyn, MA of 1967, died 2011
Spenceley, Judith Anne (née Campbell), MBChB of 1967, died 08/10/2011

Barr, Robert Chalmers, MA of 1968, died 2011

Macmillan, Anne Macleod, MA of 1968, died 2011
McConnell, Gillian (née Foreman), BSc of 1968, died 2010
Scott, John, MTh of 1968, died 15/01/2011

Black, Duncan Kerr Mather, BSc of 1969, MBChB of 1972, died 2011
Brown, Gavin James, BSc of 1969, MBChB of 1972, died 2011
Dall, Ronald Calderwood, BSc of 1969, died 01/09/2011
McCormack, Bartholomew Philip, MA of 1969, died 2011
Reid, Christopher Gavin, BSc of 1969, died 2011
Ritchie, Kenneth George William, BSc of 1969, died 2010

Elliott, Andrew John, BVMS of 1970, died 2011
Stevenson, Kenneth William, MA of 1970, died 11/01/2011

Fee, John, MA of 1971, died 2011
Smith, Iain James, BSc of 1971, MBChB of 1974, died 22/02/2011

Corlett, Alison, BSc of 1973, died 2011

Ford, James Philip Wagstaffe, BVMS of 1974, died 2011
Langworthy, Emily-Ann, PhD of 1974, died 2011
Mackenzie, Brian Douglas, PhD of 1974, died 2010
Wilson, Alan James, BA of 1974, died 2011

Bogdanovic, Sreten, BSc of 1975, died 2011
McLean, Fiona Margaret Menzies, MA of 1975, died 2011

Burgess, John Graham, BSc of 1976, died 27/08/2011
Kamil Asad, Naina Marikar, MLt of 1976, PhD of 1988, died 01/12/2011
McCarthy, Amanda Sara Bewley, BCom of 1976, died 2011

McElnay, David Arthur Brooks, BVMS of 1977, died 2011
Struthers, Robert, BSc of 1977, died 2011

Philp, Connie, BD of 1978, died 15/06/2011

Brundle, Anne Kirkness (née Leith), BA of 1979, died 16/06/2011
Fleming, Jane Mary (née Hollis), BSc of 1979, died 2010
Ross, Anne Carol (née Findlay), MA of 1979, died 14/09/2011

Duncan, Margaret Drummond, Hon MA of 1980, died 15/07/2011
Paterson, Hilary Wilson (née Sneddon), BSc of 1980, died 23/03/2011

Mackinnon, Charles Robertson, BSc of 1981, died 16/09/2011
Raynor, Amanda Mary Alice, MA of 1981, died 2011

Figueras, Isabel, MPhil of 1982, died 01/04/2011

Brown, Nigel Anthony, MA of 1984, died 2011
Okwara, Wycliffe Nelson Masaba, MSc of 1984, died 15/07/2011

Moon, Charlotte Fay, BSc of 1985, died 2011
Redman, Jill Philippa, BSc of 1985, died 2011

Collie, Helen Sheila (née Caven), BVMS of 1987, died 23/06/2011

Scholz, Barbara Caroline, MSc of 1988, died 14/05/2011
Szalapaj, Peter John, PhD of 1988, died 2010

Morrison, Andrew Scott, MBA of 1989, died 2011

Coates, John David Harry, BSc of 1990, died 06/03/2011

Cameron, Ronald James, MBA of 1991, died 2011
Gwee, Mui Boon, MSc of 1991, died 2011
Pinion, John, MBA of 1991, died 2011

Munro, Mark Alistair, MBA of 1993, died 2011

Reeves, Paul, Hon BSc of 1994, died 14/08/2011

Diaz Navarlaz, Teresa, MSc of 1995, died 2011

Nthani, Vincent Seliano, MBA of 1996, died 2011

Blake, Margaret Watt, MA(H) of 2000, died 2011
Paine, Robert P B, Hon DSocSc of 2000, died 2010

Hutchings, Jean Elizabeth, MA(H) of 2001, MSc of 2009, died 07/04/2011

Molyneux, Giles Bassingthwaighte, MBChB of 2002, died 2011

Page, Matthew Antony, BSc of 2003, died 2011

Puddu, Valentina, MA (H) of 2004, died 2011

McCabe, Carla Bridget, PhD of 2008, died 2011
O'Brien, Elizabeth Mary (née O'Brien), BEd(H) of 2008, died 2011

Svendsen, Elisabeth, Dr hc of 2009, died 11/05/2011

Jackson, James Harding, MSC of 2010, died 12/01/2011

Biggar, Gordon McLaren, died 03/10/2011

Papers from the General Council Meeting on 18 June 2011

A Presentations by Professor Steve McLaughlin, Dean of Research, College of Science & Engineering

at the General Council Meeting on 18 June 2011

Professor Steve McLaughlin

Professor Steve McLaughlin: Thank you very much Mr Chairman. I am going to talk about research, but as an engineer I would feel at somewhat of a loss talking about my colleagues in Medicine, not that I am intimidated by them, although they continue to tell me how much better than me they are, I am hopefully going to show you that that is not the case. I am going to focus on and talk about research at King's Buildings. I will however leave Informatics; although they are part of the College of Science & Engineering, they are situated next to Appleton Tower. I will give you some basic facts to try to set the context and then I am going to pick some research highlights. There are two main research highlights which are in the energy domain and translational medicine technology. I could have talked to you for the whole day if we wished, but I suspect that you have better things to do, like the lunch, so I have chosen to pick two topics which will hopefully be of interest to you. I will talk a little bit about cross-disciplinary centres, because one of the things that I think has changed since many of you were at the University is that whilst we do carry out our research within our own discipline areas cross-disciplinary, inter-disciplinary, multi-disciplinary aspects of research have completely transformed the way we approach things. As you know the University is split into three Colleges, Humanities & Social Science, Medicine & Veterinary Medicine and Science & Engineering. I am going to talk about Science & Engineering, but I would like to emphasise that the research that we do often cuts across Colleges and in fact we have very strong links with Humanities & Social Science, because of discussing issues around legal business policies which are of direct relevance to the energy market, and also in the context of the translational medicine technology. You cannot talk about technology for medicine without actually interacting with our colleagues in Medicine, so although I will focus on this College you should understand that actually the research knows no boundaries in terms of the way we actually interact with each other. We may have 'turf wars' occasionally but there are no boundaries. There are twenty one Schools, of which seven are in the College of Science & Engineering. The current Head of College, who is about to become the Senior Vice Principal for Resources and Research, and Professor Lesley Yellowlees, who will be the next Head of College, are the people who actually run things. There are seven schools, Biological Sciences, in which you are seated, Chemistry, Engineering, where I come from, GeoSciences which includes Geology, Meteorology, Geophysics and Geography, Informatics which was the amalgamation of three departments in terms of Computer Science, Cognitive Science and Artificial Intelligence, Mathematics which is in the James Clerk Maxwell Building (JCMB) which I believe you will visit after lunch and where we will visit some of the learning and teaching facilities, and of course Physics & Astronomy and Natural Philosophy. To give you an idea of the scale there are 2,000 staff who work in Science & Engineering; 5,000 undergraduates, 1,000 postgraduates, and last year the competitively won research awards were at a record level of £114.5m. That is to give you an idea of the research that is going on. Those research awards are not about paying the core staff, the academics, that is what pays for the PhD students and the Post Docs, so this is an enormous activity that makes a huge impact on the Edinburgh economy and beyond.

I was asked the question about league tables, so I thought I would comment on this. You may be aware of Research Assessment Exercises (RAEs). If you are not you are fortunate, we in the University have to think very carefully about this and of course RAEs have been replaced by a thing called REF or Research Evaluation Framework, something which is of considerable import to me at the present time. This table shows you our return from the University for RAE 2008, so whilst we would like to ignore this, I should like to point out the Quality Review (QR) income, part of our block grants associated with research, is critically important for the University, its core business is what sustains us in terms of what we do. People like to talk

about St Andrews, well I would point out that Edinburgh takes 35% of all of the research income in Scotland from the QR, so we have a third share and the rest are somewhat behind. We are in the top 6 in the UK in quality, with involvement in all the schools within the College. The College is the number one in Science & Engineering in Scotland, in fact we are in the top five in the UK. Also the rankings are done by one, two, three and four star, half of the four-star rated science in Scotland is at Edinburgh, so we are the Behemoth of research in the context of Scotland and certainly one of the major players in the UK and beyond.

These are just some of the examples of cross-School and cross-College centres. I said that inter-disciplinary research is key, so the Schools are essentially where we are teaching disciplines, where we often do our research, but we have centres which would be anchored in a single School, but actually involving colleagues from multiple schools, so the Centre for Systems Biology, which brings together colleagues from Biology, from Informatics, from Physics, actually moves Biology on. How do we actually deal with these very complex organisms? How do we model these things? And the fascinating thing about this is illustrated by a comment by my colleagues in Computer Science that they came to teach the Biologists how to do science properly and the Biologists said that they were glad that they were going to get some people who could actually programme for them. What happened was that both challenged each other's own domains, because the Biological colleagues challenged the Computer Scientists in how they use Mathematics to describe these models, and the Biologists suddenly realised that they could get much greater insight by actually adopting some of these mathematical techniques, so it was a perfect example of what we would want to gain. We have the Centre of Science in Extreme Conditions, which involves Physics, Chemistry and Engineering, the Centre for Translational and Chemical Biology, which is essentially Chemistry, Biology and our colleagues in Medicine & Veterinary Medicine. We of course have HECToR the largest computer, but what is not always acknowledged is that for thirty years we have had the Edinburgh Parallel Computing Centre, which actually is a core industry hub where much of industry in Scotland and beyond, a whole range of industries from the financial sector to the oil industry, come and make use of the facilities that we provide. There is the Centre for Regenerative Medicine that is based very much around stem cells, where of course Edinburgh has the largest number any where in the world of stem cell researchers working. They are all about to move to a new building out in the new Royal Infirmary, rather more attractive than the Appleton Tower, and then with Carbon Capture Storage, in which we collaborate with our colleagues at Heriot Watt and bring together colleagues from GeoSciences, Law, Chemistry, and Engineering, to look at how do we mitigate the carbon from our fossil fuel power plants, and this is actively supported by an enormous list of companies, and by supported I mean they put cash, hard money, in.

I want to talk a little bit about energy in a little bit more detail. I am not going to talk about wind farms, just in case anyone gets really upset, because we do not do wind very much, we leave that to Strathclyde, the technology university. We do renewable energy, very much around marine, carbon capture and storage, and a lot of work around the climate policy society with the Edinburgh Climate Change Centre. The interesting thing is that these are modern challenges, but some of you may remember that the person pointing at the flue was Steven Salter. Steven is in the School of Engineering, he is 72 and I saw him a few weeks ago and asked him how he was enjoying retirement, and he said 'I only work 364 days of the year now'. Steven is still very active. In 1974 we started in marine renewable energy, we invented it here in this university. We have an enormous history of actually doing this. It started off with the first dedicated multi-directional test facility, which we had from 1977 to 2001. We actually helped design the wave tanks, you will see later when I talk about knowledge transfer; we have had an impact worldwide. We then moved on to a curve tank, because one of the things you want in a wave tank is repeatable waves, but we do not want the waves clashing with each other, we want to actually be able to repeat these things, so Steven, who was slightly older by then, you can see him standing on the little trolley on the right hand photograph, helped design his curved wave tank which is unique in the world. This is a prototype of a combined wave and current tank, because one of the challenges that actually face marine renewable energy is how we deploy. Normally these are deployed on the sea bed and we can all deal with waves, but there are currents there at the same time and they have an enormous impact. There is the classic case of the oyster, which looks like this as it catches the waves, and when we deployed it the current turned it away from where the waves were, which is not terribly good, not terribly efficient. Two of the people who were leading this work are Robin Wallace, one of my colleagues in Engineering, and Ian Bryden, who leads the Energy Systems Group, we are developing a prototype tank, we have a very large grant of £6m from the Research Councils. We are also open to donations, I was told to say that, to help us in the process of building this full scale. The point about this is it lets us throw wave

simulations at one twentieth to one hundredth scale and that allows us to do the current between twentieth and fortieth scale. Just to give you an idea, it lets us deal with currents up to six metres a second in full scale seas of twenty eight metre high waves. The wave tank is in the process of being built and developed. This is what it is going to look like, and it will be on the KB campus. Essentially it is the most expensive hole in the ground that we have ever built on this campus.

Just to give you an idea of the impact that Edinburgh has had, if you look here at the top left you can see the first demonstration in our curve wave tank of the Pelamis wave power device. You can see it deployed there and I am going to demonstrate what it actually looks like. That is the Pelamis type and these waves are four metres high. So the original development came from a student of Peter Salters who took this and developed it in the wave tank and then took it out and developed it into a company, and if you go down to Leith you will see a very large warehouse where they actually make these devices. In the bottom right there is a thing called Edinburgh Designs; every wave tank, including those at SeaWorld were designed by Edinburgh Designs here at Edinburgh. That was a spin-off from Steven realising we had to have the capability of actually designing these tanks. It's not just that we do the fundamental research, it's not just that we have the history, it is that we understand how to translate this. In the top right you will see what looks like a Landrover four-wheel drive device. Dr Win Rampen, Director of Artemis, worked with Steven Salter, developed a hydraulic power device for cars. They were bought by Mitsubishi for £200m we believe, so our impact continues in this area. Carbon Caption Storage; we tend to think of it just in terms of power plants, but actually within thirty miles of here we have Longannet Power Station, which is going to be one of the first demonstrative plants for carbon caption storage, we have refineries, we have CO₂, we have a cement manufacturer down at Dunbar. All of these produce CO₂ and there is research going on with our colleagues in Chemical Engineering, with GeoSciences, about how we actually capture in an energy efficient and cost efficient way the carbon from these processes, transport it and embed it into oil reservoirs which have been depleted. You can do the science and you can do the engineering for this, but you also have to think about the legal and policy aspects, you have to think also that we cannot put all of the carbon in there, so what we have is a variety of ways we deal with utilisation, with business, the carbon, the capture, the storage, and this involves three of my colleagues, Professor Stewart Haszeldine, from GeoSciences, Professor Stefano Brandani from Engineering and Professor Polly Arnold from Chemistry, because we have got to think about how we actually utilise the chemistry as well. I am sure if you look them up on the web they would be more than happy to answer questions on the details of these things, which is what Deans of Research do, they deflect the questions and the detail away.

I want to change gear slightly. I am conscious that Simon is getting slightly worried that I might run over time, because he accused me of having too many slides. I want to talk about the work that we do in Translational Medicine Technology. I will start off with engineering; this is looking at integrated diagnostics, the development of an ingestible chip with colleagues in Glasgow. These are a variety of chips, a sensor chip a control chip and transmitter chip, all in the single substrate, which you can see is slightly smaller than a penny. At that size it is ingestible by a horse, but actually I would not suggest that any of you try to ingest it, but collapsing it down is relatively straightforward, that is a technology challenge that is relatively straightforward to deal with. What it was really geared towards was where the medics were particularly interested in analysing areas of the gut that they could not poke things into. I will not say any more about that. What is interesting is, that we have moved on to work with oncology where our colleagues in cancer research are actually understanding the tumour micro-environment. Tumours often get hypoxic regions. When they are hypoxic they are very resistant to radio therapy or drug treatment. Understanding when would be the most appropriate time offers the opportunity, if you can actually monitor the tumour micro-environment in real time, to actually schedule treatment when you get the maximum impact. I have also talked about the huge element in stem cells. One of the big issues in stem cells is actually moving and differentiating the cells around. One of the things we have on campus is a micro-electronics centre; micro-electronics is very mature in terms of doing things in a clean room environment and doing it at scale and there is a particular area called micro fluidics; these are water droplets, which we can move around in a substrate. In principle you can do it in cells as well, in fact we have done it for differentiating different types of stem cells. When they have differentiated into the various types of cells that they become their impedance changes and you can actually move them around and actually separate them.

We can also look at drug treatment. This relates to one of my colleagues, Professor Alan Murray in Engineering. It is an interesting case. They were interested in glaucoma in AIDS patients, often in very advanced cases of HIV or AIDS glaucoma onsets, so this was looking at a situation where a Japanese company wished to place drugs in to relieve the glaucoma, to place these chips inside the eye. What you are looking at here is essentially an electrode with a little well which has some fluid, drug perhaps. You can apply voltage, you do not need to have wires to do that. You can take a little chip with 16 to 64 of these on it so you have multiple treatments, essentially an inductive loop to put this in. The technology worked, but unfortunately the drug did not in the way of these things. This is something that our colleagues in the College of Medicine are interested in taking on to a whole variety of different applications.

This is Dr Christina Flors and Professor Mark Bradley in Chemistry. Mark is one of our research stars in the sense he is doing fundamental chemical biology, but he seems to start three companies a year and a whole variety of applications in terms of doing things, and he has taken ink-jet technology, actually laser jet printers, to print onto substrate arrays, so if you wish to look at what sort of polymers would be appropriate for a range of applications, bone repair, folio bandages, 3D cell scaffolds, stem cell compatible surfaces you wish to know and make an assessment of an enormous range of these polymers, you can print an enormous number on these substrates incredibly efficiently and test them rapidly. Essentially you have got little narrow particles which are coated and you are doing a check on each narrow particle without having to go through high volume checks and the implications for drug testing are enormous. Christina has been very much involved in looking at DNA single molecule images. I want to talk about synthetic biology. We are all aware of the controversy around GM, where science did not engage early enough with society and one of the things we have been conscious of in synthetic biology is that we have to engage with society at a very early stage. What is synthetic biology? Some people call it Pandora's Bug. Essentially it is about constructing biological systems from component parts. It is about taking the engineering philosophy of taking bits and components and joining them together to construct something. It uses computer science to allow us to do this in a really efficient way. What you need are a whole set of well-characterised components, structures, properties. Biology has never done this, it proliferates in terms of characterising. What we want to do is characterise the key components and then start to understand how you can fit these bricks together. Where is it going? Craig Venter, a somewhat controversial figure, has generated synthetic life. He is a billionaire, and was involved in the human genome, he did it privately for profit and he has developed a synthetic life form. There is some controversy around that, it's not terribly useful. There is a 'comedian' who came up with the definition of synthetic biology, he said that what they are doing in genetic engineering, is throwing bricks into the river in the hope that they could actually walk across them. What we tend to do in synthetic biology is design a bridge. Someone else, who is from MIT (Manchester Institute of Technology), is taking a slightly different approach from Venter, he has come up with the idea of bio-bricks, little bio-bricks that you can use to start to build any sort of organism. We now have an open source registry of standard biological parts, with a heavy emphasis on control and signalling parts. You can go and look at this on line, if any of you understand biology, there is a whole range of the things there. We started to build up a huge database that will allow us to think about how we would join these things together. What is Edinburgh doing in this? Well this is the fascinating thing; the person who was at the forefront of pushing this is a chemical engineer, and he is now working with colleagues in biology and computer science. There is a huge competition called the International Genetically Engineered Competition, which was set up by MIT in 2003, a large number of teams compete and Edinburgh has been involved since 2006. In 2006 they developed the bio-sensor to detect arsenic in ground water, something that is incredibly important in the third world, so its not just about synthetic organisms in the context of profit and it won first prize for the best real world application and third prize for the best device. The interesting thing about this, this is Alistair Elfick here, the team that did this, the iGEM team, are undergraduates. They were selected in their penultimate year, finished their penultimate year as undergraduates, and it is they who developed this. One of the key things here for us in terms of our research is the people who will feed our research are our undergraduates, and Simon is going to talk later about what we actually do in terms of looking after them, so I should stop there. I am happy to take some questions.

Mr Michael Conway: Could you tell us what hypoxic means?

Professor Steve McLaughlin: If you think of the way that the vascular system tends to grow in tumours, it grows very rapidly. Hypoxic simply means an absence of oxygen, there are areas of the tumour which have

grown, but there is no vascular system, so there is no oxygen in it. You need to understand how the oxygen is distributed and that is dependent on the vascular system within the tumour. You have these large parts of the tumour which have no vascular system which are completely hypoxic and they are completely resistant to radio-therapy and the cancer drugs that we apply. What tends to happen is you kill the parts which have the vascular system and are oxygenated and then the vascular system simply migrates into those areas which were hypoxic and had no vascular system and which still survive after the treatment.

Dr Alan Brown: I am fascinated by this wave and current tank, what stage has it got to? It has not been built yet, how big is it going to be?

Professor Steve McLaughlin: I should have said in the drawings that the building is about 60m square, essentially you can think of it as a big shed, which has a whole variety of workshops around it. The tank itself is something in the region of 25 metres in diameter. We have as I say about £6 and a bit million from the Engineering and Physical Science Research Council (EPSRC), the University has committed funds and we are in the process of fund-raising from both industry and any of our colleagues here, so thank you very much for that question Alan. Anybody across General Council both here and in the virtual world who might be willing to contribute we would be more than happy to engage with you. We are already engaged with a whole variety of the major companies. I should have said that this facility is a national facility. We are the leads in the Supergen marine energy research consortium.

Dr Charles Swainson: Could I just ask along the same theme, clearly wave power work has been going on for nearly four decades, when is it going to get to the stage of wind power, which we are now surrounded by?

Professor Steve McLaughlin: Well the issue is that the devices are there, but on the western fringes where we deploy these we work very closely with the developers, and one of the key issues for the developers is that in Scotland you have IMechE in Orkney which is a test centre where you can put test centres in the Pentland Firth. If any of you have been to Orkney you will realise it is very challenging sea conditions, so you need to test at small scale. There are no facilities in the world to test current and wave at the same time at scale. The devices exist, we saw Pelamis, which was filmed in Portugal, the Portuguese Government is actually investing to put these out. I think we are at the stage now where the whole issue of off-shore energy is actually critically important to deliver, so it will be in the next five to ten years that you will start to see these deployed and one of the reasons why we have got this doctoral training school is to provide the feed stock, the actual engineers, who will go out there and deliver and deploy these.

Dr Frank Stewart: Why do we seem to be concentrating on wave power, which is very variable rather than on tidal current power which is highly predictable?

Professor Steve McLaughlin: Well, I have talked about wave power, but actually we do have wave and tidal, we do research into both of these. A lot of the work is in terms of the hydrodynamics, a lot of work around how you actually build your devices to be efficient. The interesting thing about all the devices, be they wave or current, is that the vast majority of them are based on essentially taking hydraulic fluid, which is an incompressible fluid, compressing it, which is essentially the principle of the 'Salter Duck', so yes we are doing tidal energy. The issue around the tidal is there has been a lot of publicity about the Severn barrage, but that is some what problematic, as to quite how economic it is in terms of doing these things.

Chairman: Good, well thank you very much indeed, that was a terrific insight into what goes on. It is clearly important that we have to look after the students who are the next generation, well current and future researchers, so Simon I am delighted to welcome you as Dean of Teaching and Learning.

B Presentation by Professor Simon Bates, Dean of Learning & Teaching, College of Science & Engineering

at the General Council Meeting on 18 June 2011

Professor Simon Bates

Good morning everyone. Let me just extend my welcome to you, welcome to the King's Buildings Campus. I am going to talk about learning and teaching and some of the developments that I have been involved in over the last few years. To echo what Steve was saying a lot of what I will say will have relevance or impact beyond the Science & Engineering Departments that I will draw examples from. I should perhaps issue a short health warning now, there is Physics in this talk, so please do not be alarmed. It is physics that is generated by our students and I will come back to that in a little while. I thought I would just have to say a little bit about who I am and how I came to be in this role. I have been at the University just over ten years now. I had a short spell here nearly fifteen years ago in Chemistry and then returned to Physics in 2000. About five years ago I started developing an interest in teaching and learning and the way we teach our students and how they do, or do not, learn as a result of that, and I remember at the time one of my colleagues discouraging me from following this route saying, 'This is not something you should be spending your time doing', I am glad I did not listen to him actually. I am based in Physics. I took on the role of Director of Teaching in Physics in 2006 where a lot of the things I will show you developed from. I gave that up in 2009, had six months being a regular academic again and then was appointed the Dean of Learning and Teaching, so the comparable role to Steve for Learning and Teaching across the College. I find myself with quite a daunting prospect trying to cram a significant portion of my past, current and future working life into the next twenty minutes or so, so this is going to go by rather fast, it is going to just scratch the surface of some of the things that we have done, but more than happy to discuss things with people either in questions or over lunch. Let me start at the top level; what is it that guides learning and teaching within the College? Well, we have a Learning and Teaching Strategy that was originally developed in 2005. It was revisited and refreshed in the academic year that is just coming to a close. So in discussions with the seven schools comprising Science & Engineering we worked together collaboratively on a document that would define the direction of travel that we wanted to move in as a College for teaching and learning over the next few years. And it has some very simple aims that will prove incredibly difficult to achieve. It is very easy to write that 'We will be renowned within and beyond the University for both the quality and the innovation in our teaching', it is incredibly challenging to deliver that. We want to provide an excellent educational experience for all our students, equipping them for a range of different careers beyond graduation. The numbers entering higher education have expanded to the point where we have to recognise that we may be educating undergraduates, training students, to go into careers that do not yet exist. The pace of technological change is such that we do not know what these people will be doing in twenty years time or the technologies that will be an every day occurrence in their working lives. To look at that we only have to look back twenty years before personal computers, before any mobile technologies, before the ubiquity of the internet to know both how things have changed in that period and will continue to change as well. Also we are a College of Science & Engineering so we want our students to learn about their science subjects in an authentic scientific way, so they go about their studies in the same way that we as practising scientists go about our research.

Those are the aims, and my task over the next few years as Dean is to make progress towards these aims. I am not going to go through blow by blow the rest of the strategy, because I want to get on to give you some examples of how this actually translates into what we do with students like this and in some of the spaces that I know some of you are coming to have a look at after lunch in the James Clerk Maxwell Building (JCMB). What we do need to make progress towards with these aims is a number of strategic principles that we can work towards. I am going to talk about some teaching and learning activities that I think all embed this particular principle and it is about students learning in a variety of ways, independently collaboratively and with an authentic spirit of enquiry. We want our students not merely to be passive recipients of the knowledge that we have and pass on to them, but we want them to be active constructors of their own understanding. To challenge themselves and indeed to challenge us as their lecturers, and this will give them the sorts of skills they will need within their University career and also beyond as well. So all the things I am going to illustrate I hope will come back to this example principle and they all point towards this general direction. I am going to talk about three teaching episodes. This might be taking some of you back down memory lane when you undertook lectures. I am going to talk about lectures, a variant on tutorials that we

call workshops, and I am going to talk about what goes on outside class contact time in student self-study. So Lectures; this is a fairly old slide of what lectures used to be like. The lecturer of course is a medieval invention, invented as a way to transmit a scarce information resource, in this case the book, to the faithful scribes, or maybe not so faithful scribes, who attentively hang on every word that the lecturer is saying. Now the printing press was a fairly revolutionary information technology. Technology has also changed rapidly in the last twenty years or so, the accessibility and availability of information has also changed beyond all recognition. An awful lot of lectures have not changed anywhere near as much or as quickly as they needed to. I have been in, never given, but I have been in lectures where I recognised things like that. I recognise what is going on in the back row; it is interesting it used to go on even in medieval times. So I would contend that a lecture as a means to transmit information to students is hopelessly out dated for the kind of information world that we live in today. I believe that there is an alternative. The sorts of things that we do with our students, and this is broadly applied across Science & Engineering and indeed elsewhere in the University, we do not use the lectures simply to transmit information to them. They can get the information in so many other ways we do not need to spend valuable class time doing that. We want to use the lecture time, that precious time when we get them all in the same room, to engage them actively, to challenge their understanding and to help them make sense of that information. It is not that the information is scarce any more, there is almost too much of it and we want to help them make sense of that information. So from the ancient to the modern, apologies, this is slightly blurry, it is not your eyes, this is half of one of my first year physics classes, actually taken in the Appleton Tower, so not withstanding the comments about what the outside of it looks like, the inside really has been transformed in the last few years. This is a central gangway in one of the larger lecture theatres, it seats about 300 students, which is the size of our first year physics class at the moment. This is my students in a physics lecture. I like showing this slide to my colleagues and saying to them 'what point of the lecture do you think this is?' and of course most of them will say 'Well clearly it is the beginning or the end, because you have not got control of them, there are people turning around, they are talking, they are not paying attention, it doesn't look like what I would recognise to be a lecture'. It is not at the beginning or the end, it is right in the middle and it is my students engaged actively discussing a problem between themselves that I have set for them, so I have challenged them with a question, we use little electronic devices we call them clickers, they are remote handsets, rather like on 'Who Wants to be a Millionaire', an educationally valid version of that, so students can actually commit to an answer. It engages them in the process. They choose an answer to a particular question. I then say to them 'Okay some of you have got this wrong, find someone sitting near you', its not ideal in a raked lecture theatre, but you can just about do it, 'find someone sitting near you and just take a couple of minutes to tell them why you chose what you did and to listen to them to hear what they did'. Then we get them to revote without any input from me at all. I might wander round and listen to some of the discussions but I am not there giving hints or instructing them what they need to do. Let me show you an example, so here is the first bit of physics, do not worry if you cannot read it and I am certainly not going to pick on people in the audience for the correct answer. We set them these sorts of questions, they are conceptual in nature. I don't want them to do long algebraic manipulations with their calculator and complex mathematics, I want to really understand if they understand the concepts of what we are teaching them. So this is a concept that by the time they come to university they have had nearly two decades of firsthand experience with, and it is gravity and it is to see if they really understand what gravity is and what it means. The basic fact is that not all of them do when they come in to our courses. So don't worry too much about the numbers here. The green bar is the correct answer for anyone who does have a physics background and is wondering which is correct. We get the students to vote. The upper panel here is what they vote when they make an individual choice, and you cannot see it, but that goes up to about 40% of the count getting the correct answer. We then had this peer discussion. It is a technique developed by a physics professor in Harvard called Eric Mazur, who has written and presented extensively on this sort of pedagogy then the students revote and this goes up to about 65% in this case. This is very repeatable, so with this question and with other questions, it is a very very powerful message for students in the early part of their undergraduate career, that there is this huge resource amongst their peers that can be useful and effective in improving their learning. It is not all about the instruction and the understanding coming from one person at the front. We do that very early with students, in the first few weeks of their time at university. So that is lectures, just a quick example of how we try to make them a more engaging and interactive experience for students; we like to think that we are exercising much more than their writing hands, we are trying to exercise their brains as well.

Let me talk about workshops. Workshops is a name that we give to a variant of tutorials, so the typical complement to whole class lectures in science courses, aside from experimental laboratories which we have not really got time to go into today, would be small group tutorials or examples classes or problem classes. Now, in my experience of giving these, some of them work effectively, some of them feel a little like this, so these are not our students, you do not have to worry about this, it is just taken off the internet. And talking to colleagues and also to students, it seems to be sometimes small group tutorials work, for one reason or another do not seem to work effectively, they leave both students and staff feeling quite dissatisfied. In the worse cases students can approach them unprepared for what they are being asked to do and sit there in slightly smaller rooms than this lecture theatre, but just expect to be given another mini lecture on the course and I do not think that is the intention at all. A few years ago I found myself on a committee looking at refurbishing, once again we come back to the Appleton Tower, the Appleton Tower lecture theatres and we spent a long time thinking about colours, shapes of seats and desks, and things like that. The reason I found myself on it was because we were putting the hardware and cabling in for these electronic devices that would enable this peer discussion in lectures. At the end of one meeting somebody happened to mention 'We should really do something about the tutorial rooms as well' which looked like this, which was hardly going to inspire world-class learning in my view. And so I managed to persuade the University that we could do something a little different. In fact we had already been doing it in Physics, we had had no space to do it effectively, so we found ourselves billeted in an experimental laboratory, so we cleared all the experimental stuff away that was for next semester, we wanted to do a different type of activity that we called a workshop. We wanted to have the benefit of students working collaboratively in small groups so they would be solving problems together, they would be practising the sorts of presentation skills that would stand them in good stead for when a few years down the line they had to stand up in front of the entire department and their colleagues to give a presentation on their final year research project. We didn't want this to be going on in fifteen different rooms around the campus and we didn't actually know what was going on in each of these rooms, so we wanted to have the capability to bring the whole class together, so that we could address the whole class, we could give them advice on a particular problem that they were working on, in this case they are discussing a relatively simple demonstration using an air track. If you like we wanted the best of both worlds, we wanted the best of small group, collaborative learning with the ability to address the whole class at the same time. The problem was, as I said, we had no space to do that. We were fortunate, I will come on to talk about spaces in a few slides time, because that really is the thread that draws all this together, that is the provision of effective spaces for teaching and learning, but it was really fortuitous that at the time when the University was thinking about refurbishment we had already been undertaking some of these taught sessions in makeshift workshops, so I will come back to show you what our redesigned workshops in the Appleton Tower looked like in just a few slides time.

The third area I wanted to touch on is that of self study. We carefully plan what we do with our students in taught classes, we have next to no idea what they do in self study, what they do outside formal class time. What we tend to do a lot of the time is to make use of new technology and think we will put stuff on the web for them to do, we put it on the VLE in its worse case I think this is just using the web as a digital filing cabinet, it is just putting material out there for students saying 'Go and engage with this in your own time and hoping that magical and wonderful things happen. Often they don't, when students are trying to engage in these quite cognitively demanding tasks, its not acquiring information but trying to make sense of it and to integrate it into what they already know, there is often not the kind of help and support from experts or peers. But you can use the online environment to do this, and I will show you one example of that, an experiment that we undertook in a first year class in the academic year just gone, with really quite remarkable results. We used this tool, it is an online software system called 'Peerwise'. It is freely available, developed by a colleague in computer science in the University of Auckland. Auckland is one of the Univeritas 21 network of research universities, and through that collaboration we brought the author of the system over for a workshop last year. It was so successful we brought him back in December because so many people across the College and the University wanted to make use of it. Very briefly the system is a tool with which students can create their own assessment questions. That doesn't really sell it too much to maybe you or students, the really clever thing about it is that it incorporates an awful lot of the social functionality that I know my students spend most of their lives online engaged with. So it has the same kind of compulsiveness of Facebook or the sorts of social media and collaborative tools that we find on a group of other websites. In essence what it allows students to do is not just create material, but answer material posted by other people, rate that of their friends, follow certain authors, engage in discussions about what they are writing. It is a

virtual space for them to talk about and do the science of their courses. So we took a bit of a risk on this. We built it into the assessment for our first year physics course. So we said to students, 'You must create a certain number of questions, answer others, talk about other peoples, rate each others, and things like that'. We made it a fairly small amount of the course credit, just in case things went badly wrong. What we found was absolutely staggering. These are first year physics students, a class of 200, created over 700 multiple choice questions. That is about as many as you find in an average physics text book. We had done the right thing in terms of setting the bar quite high, we had given them training in the appropriate scaffolding to know what makes a good question and how to go about writing them. The quality was absolutely phenomenal. Some of them were so good, aside from the artistry and creativity that some of our students showed. You would not normally imagine physics students being artistic. This is actually a very, very good question, but it is not a simple question. It is a real problem, students cannot look at this and immediately say 'Yes, I know how to solve this, I know the equation that I need to pluck out of my brain or a book to be able to solve this'. These are real problems. Just to show you some of the other things, they all had the strangest contexts. One student had a thing for penguins in top hats. I don't really care about the context, if that engages students, fine. At its heart this is probably familiar to engineers and physicists as an Atwood machine, and quite a complicated one. This is all student-generated content, I am going to show you as I flick through the next few slides, this is the question that the student wrote, this the solution, so the student created and did all these diagrams, this is the mathematical explanation of the solution, again this is done by a first year student four weeks into their career at university; and most gratifying for us they are doing it algebraically, they are not putting numbers in, which is the thing that is the bane of my life with students. And there is also dialogue going on, this is someone who answered it saying, 'I couldn't figure out how to do this, but have you got it wrong here? No, I haven't'. There is a dialogue going on here between students, working in their own time, using this system, engaged in productive study of their subject. This experience really has been transformative, and it is making us rethink the entire way we go about assessment, and I really think we have underestimated the creativity of a large fraction of our students. I asked our final year students, the ones who would be graduating in a week or so, 'How many physics problems do you think you have solved during your undergraduate career?' and the median response was around about 1,000. I asked them how many they had written and nobody had written a single one. Let me very briefly finish off. Trying to do all this stuff requires a number of enabling things; it requires high quality students, we are very fortunate that we get very good quality students. It requires highly motivated and engaged staff, who have to balance a variety of different roles within their academic life. We are expecting them to be outstanding teachers, to be effective researchers, and also to contribute to the sort of civic duties that are required to keep their departments going. Additionally as well, and I think this has often been neglected, we need appropriate spaces to do this, physical spaces, virtual spaces, in which our students and staff can engage in this. I have shown you one of these pictures already. This is what a typical tutorial room and lecture theatre looked like in the Appleton Tower c. 2005, not particularly inspiring I would say. This is what that tutorial room in the Appleton Tower now looks like, this is the first teaching studio that the University built. It seats about 110 students. It is quite long and thin, like a railway carriage, shape, there is not much we can do about that, that is the shape of the space within the building. But you will see, we have got students working collaboratively at these small group tables, working with postgraduate tutors, but they are also able to collaborate more broadly with each other between tables. We can bring them all back to focus on the front if we want to. This was a design that we adopted in Physics, based on something that MIT had done around about 2000. They got a \$1m from Microsoft to be able to equip one of these rooms with all the technology. We were very, very fortunate that we had support within the University, and the University had enough courage to be able to say, 'Yes, this is what we want to do. We want to build these spaces, but we are not quite sure how academic staff are going to use them, because part of what you need to do with spaces like this is to see the sorts of things you can do with students, but it certainly has changed the way some of my colleagues in Science & Engineering think about how they use these spaces with students.

I will just show you a few more slides. That is what it looks like somewhat less cluttered with human beings and bodies. This is the third generation of this sort of space. This is actually from the King's Buildings, some of you will have the opportunity to visit this room. It was opened last October by the previous Chancellor, the Duke of Edinburgh, where we had a really engaging authentic activity where we put staff, students and alumni together in this space and underwent a mock teaching activity with them. We felt that the best way to show them how the room was used was to actually use it in an authentic way. Other spaces as well, some of you will get the chance to see this within King's Buildings. Plenty of technology, but as well there is a focus

on collaboration and interaction in a much more low tech way. Students working round the tables in groups. The technology is there at the end of the table, you can use it or not use it if you don't want to, it is like an invisible member, you can just turn it off if you do not want to use it and you want to focus on collaboration. This is one of the nicest features, again we tried out experimental things when we were redesigning some of these spaces. This is a student-bookable room, in principle this is a staff-free zone, students can book this through the MyEd system that they use to access all their online information, and it is just available for student group study. We built three of these in JCMB and they have been hugely, hugely successful, they are constantly booked out. In the run-up to exam periods you will see students working in groups, there will be exam papers on the board, this is an electronic Smart Board, so they will be up there writing on it, they can save their work so they can take it away with them afterwards, and all of this development, trying out experimental facilities like that leads us to what I would contend is an equally expensive hole in the ground as the wave and current tank, this is the new King's Buildings Library. If some of you came through the campus you may have seen the hole that will become this in about twelve months time, next to the KB Centre. So this is a library, it is also going to be a space, a learning space for students, a learning resource centre, that will embody some of the spaces I have shown you on previous slides from previous experiments with students in terms of trying to find out what works for them in supporting their learning. Before I do what I accuse Steve of doing I will stop there.

Chairman: Well, things have obviously moved on since Mike was recounting his days in the Appleton Tower, in those awful photographs. A really fascinating talk, it is great to see what is happening with the students. Any questions from the audience?

Lucinda Mackay, Fine Art Graduate: Can you please tell us where the medieval picture of the lecture is from?

Simon Bates: I could probably find you the reference. I got it from a talk given by the Director of Research of Google several years ago at a conference I went to. It seems to be one of those now that is appearing in peoples' slide packs. There is a Wikipedia Commons reference for it, so I don't believe I am breaking any copyright by showing it, but certainly if you Google it you will probably find it.

Professor Ann Smyth: I was one of the first generation of students in Appleton Tower, the much maligned, and actually I don't have such bad recollections, but what was interesting to me about your fascinating talk comparing that generation and now was your total absence of reference to the laboratory and I wondered what had happened to that concept of experience and whether today's generation of students in Science & Engineering actually do not get their hands very dirty in their undergraduate career.

Professor Simon Bates: Well I am glad you mentioned that. The only reason I excluded laboratories is trying to be brief. Laboratories are another area that have undergone a huge amount of change in recent years, so if I reflect back to my own experience as an undergraduate I hated laboratories because they were very recipe based, they seemed completely divorced from the theory or the content I was getting elsewhere, I was probably never very good at them as well, which is probably why I ended up being a computational physicist. Developments are in hand to make labs far less recipe based, far more investigative and enquiry-based. We know what the outcome of the lab is going to be, whether it is synthesising a particular chemical or measuring G with a pendulum, we still do that experiment, but for the students, they can still approach it with the spirit of enquiry, because it is new for them, it really is a voyage of discovery, they have never done it before, they don't need to be told, 'Do this, measure this, do this, do this.' Some work we have been doing is getting our students to actually devise their own experimental protocols, so they do not get it spelled out for them. They have to come up with an effective, safe, appropriate experimental protocol, have that checked by a demonstrator. The challenge that we face is the huge variation in the amount of practical work they have done at school before coming to university, which can range from really quite extensive, open-ended experiences with the Advanced Higher project investigation to students who say, 'Well we sort of watched a few videos, or the teacher did demonstrations'. It is very, very hard to accommodate that diversity and to differentiate that range of experiences.

Professor Ian Sutherland: Two questions perhaps I could put to you. One is, do the teaching staff, those who really are developing all the methods that you have described, do they get adequate support and

adequate time within their very busy schedules of doing research and other things to develop the new technology. The second one is certainly in my experience, teaching in this building for many years was that many of the students had a very narrow outlook on their particular subject. Clearly from the talk we had from the engineering side, that is something that the engineers are taught to ignore, that they are taught to think very widely, but among many biologists, certainly in my experience, many of them were so focussed on one particular area of biology, it was very difficult to get the interdisciplinary approach which, as has been pointed out, is very necessary nowadays.

Professor Simon Bates: To come back on your first point about support, space and time to develop this. It is different in individual schools, but I can confidently say within Science & Engineering, all the schools recognise that if you are going to change and improve and develop teaching practices then inevitably that will cost time. So, there are very good mechanisms. I think as well as making time for staff, the appropriate recognition and reward procedures need to be in place for them as well. It is one thing to be given permission to do it, you would like to think that you are going to be appropriately recognised, and also in terms of career prospects and development. Different departments solve it in different ways. In my own school, in Physics, we have teaching only appointments that we call Teaching Development Officers that do a lot of the development work, because we recognise that with the best will in the world, giving it to a busy academic and saying ‘Can you just revamp this lab course, or think about something interesting to do in workshops.’ They are very busy, it is not the sort of problem you can solve in a spare couple of hours on a Friday afternoon. So in Physics we took the choice to employ people whose main function was development, delivery and evaluation. It is all very well doing it, but you have to know that it works as well. We have two of those posts now, and they are regular academic members of staff with a particular teaching focus, so they are not the ‘dogs’ bodies’, they do not get all the jobs that nobody else wants to do, like 400 first year lab books, or something like that.

As for the narrowness, it is still a problem to a certain extent. We are trying to encourage students to take a broader range of courses in their first year that we hope will expand horizons a little bit. We have an opportunity next year in the way in that the academic year is changing with the introduction of something called Innovative Learning Week, which will take place in the middle of Semester 2. It is not going to be a reading week, it is not going to be a holiday, it is time set aside in the timetable for students to do other things, other styles of teaching. It won’t be assessed, it will not count towards their course marks, but it is an opportunity to develop these interdisciplinary activities and just break out a little bit of the still fairly traditional mould of courses delivered by one team of people within one school.

Kirsty Macgregor: Simon, you said at the beginning that the University had not performed terribly well in the National Student Survey. Can you say a bit about what impact the Learning and Teaching Strategy has had since 2005 and what impact you think it will have in the future.

Professor Simon Bates: So, just for the record, it was Steve who said that. Again, let me qualify that. There are areas of the National Student Survey where the University performs well into the top quartile of the Russell Group universities consistently year on year, so to give a signal or a message that the University does not perform well in the NSS is not correct. But there are particular areas, most noticeably in Assessment and Feedback where the University’s performance has been disappointing and not just within the College, but the University as a whole has recognised this as a major problem and has put in various schemes and developments to try to change this. Part of it is an awareness raising activity with staff and students, so students recognise that feedback is more than just the mark they get on their assignment, so there is a perception problem here, and an education process for staff that good feedback takes time, it needs to be done in a timely fashion. There is no point in getting the feedback on your essay six weeks after you wrote it and after you have written your next essay. Ideally you would like it as soon as possible after the first so that you can make some changes going into the second. On a University scale I think one of the most pleasing developments we have seen over the last couple of years is the agreement of what are termed ‘Guiding Principles’ for Assessment and Feedback, that lay down requirements for schools, for staff and for students as well, so there is a notion of shared responsibility; so whilst there is a responsibility on staff to provide effective, timely, useful feedback, there is also a responsibility on the part of students to seek out opportunities to receive that feedback and to act on it when given. I will give you one particular example; staff go to lots of trouble grading assessment work, weekly homework, assignments that are handed in. They

are understandably very frustrated when they find a large pile of it not collected, week after week, by students.

Mr Malcolm Errington: Having moved my own career out of teaching into teacher education in another university, when I arrived I was very struck by the tension between, and I think it still exists, the parity between teaching and research, and I remember having to help a colleague with some students' complaints about his teaching skills, and the response I got was 'Well, you know, I am focussed on research. Teaching, what is that?'. And so I just wonder where we are in this whole debate. It is all very nice and I am really impressed with what you are saying, but given the economic conditions and universities having to compete for finance, for research and inevitably the notion about promotion structures, I am just wondering where we are, particularly in Russell Group Universities such as this, where that whole debate is in terms of research and teaching..

Professor Simon Bates: Well let me make two observations to that. I think we are in a competitive marketplace for students as well. If we want to try to attract the very best students to undergraduate and postgraduate programmes from all over the world, and indeed doctoral research students, then we have to be mindful of the quality of the experience that we are delivering to them. Regarding parity of research and teaching, there is always a tension, there always has been, I think there always will be. In the five or six years that I have seriously been involved in educational development work I think the University has made huge progress and huge strides. There is now a much more transparent procedure for promotions on the basis of teaching excellence and teaching leadership. The University has a route to full professor for teaching leadership. In terms of personal chairs of student learning, I think there have been seven or eight of those in the past few years. The pace of change is there, it might be slow and frustrating and not fast enough for some, but I do think we are making good progress.

Professor Steve McLaughlin: Could I just make an observation; one is 50% of income comes from research the other 50% comes from teaching. And secondly, our future researchers are actually our undergraduates. So whilst there is a tension I think you will find that vast majority of staff recognise the need that we have to do both excellently.

Male (anonymous): I noticed in your aims that there was the word 'enterprise' next to 'science' and I was wondering if that was relating to the individual innovative research capabilities of the student or was it about science as a commodity, or in other words are you still doing science for the sake of it when the outcomes are unknown and you do not know what you are going to get.

Professor Simon Bates: Yes, to a certain extent, but also the other definition of enterprise. I think it is a broad view that we have to take, and certainly from Steve's presentation there is a good amount of fundamental scientific work that goes on within the College. There is also highly applied and business-focussed research that goes on. In my own area in Physics I am often challenged by people saying 'All this stuff you are doing in particle physics, not my research area, all this money that has gone in to build the large Hadron Collider, what use is it, what is it going to tell us?'. My stock answer is to bring out an iPod or an iPhone, because without an understanding of quantum mechanics and giant magneto resistance, something that won the Nobel Prize in Physics a few years ago, people would not be able to have the sorts of data storage they have on mobile devices, so that is an example of something that seems very esoteric without any primary application at all, eventually coming through to have an application that is ubiquitous certainly amongst all our students, who have these mobile devices.

Mrs Margaret Tait: Thank you for your very interesting and entertaining and encouraging presentations. I can see that the number of women at KB is increasing, the number of students is increasing, but it is not reflected in the senior lecturers, readers and professorships, apart from Chemistry, in which it was always very good. What plans have you got in place to increase the number of women as professors and so on to be good role models for these students that are coming up and to see that it is okay for a woman to be a professor. She is not necessarily a blue-stockinged geek. What plans have you got for perhaps family-friendly policies, onsite nurseries, encouragement. I and the other Court members here would very much like to hear it.

Professor Simon Bates: That is a rather difficult question, a rather broad question to answer, but I will do my best. If I pick Engineering, which historically had a very low count of female members, historically it was often ten percent of the students were females. That ultimately feeds through, so you have a generation. If you look now for example at Civil or Chemical Engineering the number of female students is 50/55%, so to an extent I think part of that problem will deal with itself, in the sense that we have many more female students, female undergraduates, coming through, female PhD students, they form a significant part and as they develop into researchers they will be able to do that. Now that has enabled them when they go into research because we have in society a much more flexible attitude to child care in terms of maternity leave. Within the College I know that we have pushed very hard to have child-care facilities located on this campus, but the issue is as always I believe, is a financial one; how do we find the space for the building and then how do we find the money to actually fund that and I am sure the University would more than welcome donations from the General Council to build a child-care facility, but they are doing their best in that regard and I know speaking to many of the female staff across the University that they do not see it as a big a problem as it was. For example, on the Research Committee that I chair in the College three of the Directors of Research are female professors, and only one of them is in Chemistry, so actually we have a much more dynamic cohort, but the nature of academic careers is often very long and it takes time for this gradual progress, we are a bit like the Titanic, but actually that is the wrong word to use, it takes a great deal of time to actually steer and to make these changes.

Mrs Margaret Tait: I am one of the General Council Assessors on the Court and we have been pushing very hard and indeed we have got to the stage of the onsite nursery facilities for a Feasibility Plan coming forward. And also in the issue of personal development, particularly of women in academic life, so that their career development can be pursued, we are pushing this on the Court.

Niall Martin: I was in Chemistry 1961, I remember how it was then, when I first came in, fifteen hours of lab a week in second and third year and I remember about the amount of time spent on manipulative exercises, pre-planned. I was not very good at that, I have to admit, but it was a bane and I am glad to see that something is being done about it so all the best to you.

Alison Fuller, BSc Botany: I think this follows on from something somebody said earlier on, but I wonder how traumatic it is for the students making the transition from school to university. This is all so very different from when I was at university, I guess from when I was at school, do you have a need of extra resources for counselling and so on.

Professor Simon Bates: I agree, the transition period, particularly the first semester of the first year is absolutely crucial. I think one of the general messages we have been trying to get over to staff is they have to be aware of how different students respond to that change. For some students it is not all over and done with by the end of Fresher's Week, it can take them several weeks, or even longer than a semester to adjust to academic life. Equally on our part we have a responsibility to make it very clear what is expected of them and not assume that they will automatically pick it up out of the ether or something like that. We have to recognise that they are coming into a very different learning and teaching environment from the one that they have been used to. Even basic facts like they are in classes often ten or fifteen times larger than they have been used to at school.

Chairman: Thank you very much, we have had an excellent pair of talks and clearly the General Council as a body is extremely interested in teaching and learning and the student experience, as you can tell from the questions, as well as the research, which we know is done magnificently in this College as in the others. So, perhaps a round of applause for our two speakers.

C Presentation of the Report of the Business Committee

at the General Council Meeting on 18 June 2011

Convener of the Business Committee: Dr Alan Brown

Mr Chairman, Members of the General Council, it is a pleasure to see such a satisfactory attendance in this most impressive King's Buildings complex. From our records this is the first time we have had the meeting here. There has been considerable building development, which is continuing, and as we shall hear shortly, there is also outstanding research and teaching to match the excellent facilities. Judging by the 167 webcast hits for last February's meeting in the Old Quad, I warmly welcome those General Council Members who are watching this live webcast, we trust the technology will work well on this occasion. I welcome our speakers from the College of Science & Engineering, Professor Simon Bates and Professor Steve McLaughlin, and also Dr MaryCatherine Burgess, the Associate Chaplain, to what very sadly will be her last official involvement with the General Council before she retires from the post.

Since our February meeting we have embarked on an exciting new chapter in the history of this ancient and distinguished University, with the election of our eighth Chancellor, Her Royal Highness The Princess Royal. Dr Frances Dow, Vice-Convener, and I had the honour of proposing and seconding the nomination and after due process her Royal Highness was elected without opposition with effect from 31 March 2011. Following a letter informing her of the successful outcome The Princess Royal replied that she looked forward to a long and fruitful relationship with the University. Members will recall that the Business Committee was thinking about how best to mark our previous Chancellor's long and outstanding service. With the agreement of his Royal Highness The Duke of Edinburgh we have renamed our very successful scholarship 'The Prince Philip General Council Scholarship', so that his name will be linked in perpetuity with this prestigious fund. I have no doubt that when General Council Members are considering donations to the University they will be greatly encouraged to support this even more worthwhile award.

The Business Committee and the four Standing Committees continue to do important work on behalf of the General Council for which they deserve our thanks. An important current project is the introduction of online voting in the General Council elections early next year and the plans are progressing well. If members have not already done so I strongly recommend they register their email addresses through the MyEd Alumni Portal, details of which can be found in the *Billet* section of the recent *Edit* magazine. Those wanting to continue with a postal vote are able to do so, but they should register their wish with the General Council Office.

The new simplified Ordinance which was discussed at our last meeting continues to make good progress. It received helpful comments from the Privy Council and is now back with the University Court where it is anticipated it will be accepted. Then the final approval will be by the Privy Council. Our Constitutional Standing Committee is updating the Constitutional Arrangements and Regulations in line with the Ordinance and related changes which were agreed by the General Council.

We like to think that the Business Committee works well and efficiently, but there is always room for improvement. We have therefore set up an Effectiveness Review of the Committee to be conducted by a small group, mainly from the Committee and chaired by Dr Frances Dow. We will inform you of the outcome in due course.

We look forward to the Reception and Lunch after this meeting and to the address by Dr Ian McKee. Our next social event is a Festival Reception and Exhibition Viewing in the Talbot Rice Art Gallery on Thursday 25 August. We will be joined by the Friends of the Gallery and members of the Graduates' Association. We hope to see many of you there to enjoy the exhibitions and to meet with friends and colleagues. In a year's time, on Saturday 16 June 2012, our next out of Edinburgh meeting will be in Brussels. In conjunction with the University planning of the weekend's activities is well under way and it promises to be another memorable few days. You should put the date in your diary. (Post Meeting Note: Due to insuperable problems in the organisation of this meeting it will not be held in Brussels but in Berlin)

At the end of July we bid farewell to five members of the Business Committee, Gordon Cairns, Ralph Parkinson, Alan Simpson, Frank Stewart and Hilary Vandore. We thank them for their most valuable contributions. In August we welcome five new members and two Court Assessors to the Committee. It is vitally important that we continue to receive enthusiastic support from General Council members and we very much hope that many of you will consider standing in the next elections in February next year. Thank you very much.

D QUESTIONS AND ANSWERS

at the General Council Meeting on 18 June 2011

Chairman: There are two related to the recent election of the Chancellor; one from **Mr Adam Ramsay**, MA in Philosophy and Politics 2008; although he received an email about this meeting he did not receive an email about the opportunity to nominate a candidate for Chancellor and in a similar vain, **Mr Thomas Keene**, who is a graduate in Computer Science from 1981 and PhD in 1989 was also disappointed that he was not able to vote in the recent election for Chancellor, because there was only one nomination and he felt that placing an advertisement in the Scotsman was not sufficient. Could I invite the Secretary of the General Council to respond to these two observations.

Secretary: Thank you Mr Chairman. Yes we have received comments about this in the online questions and we have also had some emails sent in previously on this topic. As you will all know the election of the Chancellor is the responsibility of the General Council, and as you might well imagine there is a very well regulated process for this, which is regulated by Ordinance as well as by the Constitutional Arrangements and Regulations of the General Council. These are available on our website should you want to see them. The process was followed very carefully after the retirement of the previous Chancellor, the Duke of Edinburgh, in December 2010. The election was announced in a public notice in the Scotsman as is required by the regulations. This announcement was repeated at the Half-Yearly Meeting on 12 February 2011 and has also been mentioned in the Winter issue of *Billet* within *Edit*. The Half-Yearly Meeting was of course also webcast. Information in addition to that which was required about the election of the Chancellor was also available on the General Council website in our Elections section so that people who were interested could find out about the process and what was necessary. However, at the close of nominations on the 17 March 2011 there was only one valid nomination and in line with the regulations that person, Her Royal Highness The Princess Royal, was held to have been elected Chancellor and no ballot was therefore required. The question has also arisen as to why email was not used to inform all members of the process. Email currently only reaches slightly more than one third of the General Council Membership, in fact 35%. Accordingly it is currently not thought suitable as a sole channel for important announcements to General Council members. A direct postal mailing was not considered necessary, not least because the cost of a mailing could amount to up to £42,000, which is a substantial cost. We felt that the current existing arrangements for announcing it were sufficient, and an emailing only reaches very much a minority of members. However, we will be more than happy to reconsider this on a continuing basis. That is the current position. Thank you.

Chairman: Any other further questions on this topic?

Mr Ralph Parkinson, Convener of the Constitutional Standing Committee: The provisions for the election of Chancellor are contained in the current Ordinance and the Constitutional Arrangements of the Business Committee. When the new Ordinance gets approved the Constitutional Arrangements will be minimal in there and the Regulations will contain the provision for election of the Chancellor, which it does not at the moment, it only covers Business Committee Members and Assessor Members, but it will in the future, so it is just to be factually correct, in case anybody challenges you.

Professor Ann Smyth, Assessor to Court: Just to comment on the information given about the intention to review the effectiveness of the Business Committee, I thought it might be helpful for colleagues to share my understanding which is that the group taking this forward would indeed include some external representation as one would expect in such activities.

Secretary: I am quite happy to confirm that Professor Smyth.

Chairman: Any other questions from the floor at this point? I have another one now that was emailed in. It is from a **Mr Richard Ellis**, who is a Master of Education 1978. Mr Ellis raises the question of the reproach against good design and affront to the modernity of the George Square campus referring again to the Appleton Tower. Many of you will be familiar with the fact that the Appleton Tower has been raised a number of times. I know it is not the most attractive building, and that the Principal and Vice Chancellor has responded to this in the past, but could I invite the Convener to bring us up to date with the position.

Convener: Yes, as you said, the University is aware of this issue and the Principal has indeed discussed this at previous meetings. The problem is, of course, the cost of refurbishing the external part of the Appleton Tower would be prohibitive, and in the current financial climate the budget is extremely limited. The panels have been stabilised on the outside and of course the inside has been refurbished to a tremendous degree and is a great success. But the University is aware of this and if any members of the General Council wish to donate £1m or so, as they have done for the courtyard of the Old Quad, the money would be used for that purpose.

Mr Peter Freshwater: I have to say that the erection of the new Informatics Building has actually adjusted the context of the Appleton Tower. If you look down the street towards the new Mosque, you have got the Informatics Building on the left, the Appleton Tower on the right, the Mosque beyond, they make a very attractive building group, so in fact with more recent developments I suggest the enormity of the Appleton Tower has been reduced.

Chairman: Thank you very much, that is a very positive take on this solution, thank you. We have another question from a **Mr Keddie Law** who is a Geography honours graduate from 1968 who would like us to comment on the apparent slide of Edinburgh's position in the University guide; that is the one published by the Guardian. We have apparently slipped from ninth to sixteenth, and meantime St Andrews has risen to third, behind Oxford and Cambridge. Perhaps I could invite Professor McLaughlin to offer any comment.

Professor Steve McLaughlin: Yes, I will illustrate in my talk in terms of our research capabilities, Edinburgh rides in the top six in the UK and certainly in the top forty in the world. I think the issues are in the National Student Survey, because surveys like the Guardian University League Tables tend to take a very broad view and in the National Student Survey the University has done poorly and my colleague, not that I wish to pass the buck, will talk about some of the developments that have been taking place to actually provide feedback, to actually allow our students to have a much, much richer experience, and I think our, I would hesitate to say demise, but our drop in the league tables is temporary and will soon be overtaken when we will be back where we belong.

Chairman: Thank you. We also have a question on a similar theme, to do with students, from **Paul Kinnear**, a BSc Hons student 1962, who is worried about the increasing costs facing students in repaying tuition fees and living expenses and has asked whether the University has considered the possibility of an accelerated honours degree, particularly for students who have shown their competence and capability earlier in the course. Could I invite Professor Bates to comment on that idea?

Professor Simon Bates: I wonder, just before I respond to that, there was someone who wanted to make a comment related to the previous question.

Dr Niall Martin: I really deplore the spread of league tabling among universities. I am totally cynical about it, and I think we should all be cynical about it and if anything could be done to reduce this fashion I would love to see it happen.

Professor Simon Bates: On the topic of accelerated degrees, this is something that has been quite actively discussed within the University. Within Science & Engineering, it is already possible to undertake a Bachelor's Degree in three years by advanced entry which is effectively entry into the second year of an undergraduate programme, so that we remain competitive with other universities in the UK who can offer a similar three year Bachelor's Degree. Regarding shortening or compressing the degree at the other end,

trying to combine two years' worth of study into a final eighteen months, has been looked at, but there are tremendous challenges, both in terms of fitting the amount of discipline material into a shorter space of time, and the possibility of extending the academic year, the taught year. We are certainly cognisant of the financial challenges that students and their parents will face and we are having quite a healthy discussion actually around the University involving all three Colleges where pretty much all ideas are being discussed, but I suspect it will be a number of years before concrete plans emerge.

Mr Malcolm Errington: On that point I think it would be a retrograde step to shorten the Scottish four year degree, which I think has been a tremendous tradition for historical reasons as well as academic reasons for centuries. There are big advantages for students starting a four year degree in all the universities. There is chance in first year to experiment, change minds, whereas the three year sprint degree, one could categorise the English model, really constrains very clearly; my son started here doing Chemical Engineering, changed his mind and then went on to do Maths. Had he accepted the offer from the Russell Group English universities that would not have been possible. So I think the four year degree should be protected.

Professor Simon Bates: That previous view is shared by many of my colleagues, and in fact I was in the previously discussed Appleton Tower yesterday where we had a very successful open day and many parents of prospective students from both Scotland and elsewhere in the UK saw the appeal of that broader base for the start of an undergraduate degree.

Dr Frank Stewart: Perhaps we could say that Scottish undergraduates, like Scottish whiskey, require time to mature.

Chairman: I have a final question now from **Professor Sheila Wirz**, PhD Linguistics, 1987, who is currently Professor of International Health and Development at University College London. She writes about a decision made by the European Court of Human Rights recently in respect of an English student at the University of Glasgow called Emma Block. Some of you may have read about this and be more familiar with it. Essentially the European Court ruled that the discrimination she was complaining about, which was the payment of fees as an English student coming to a Scottish university compared with EU students and of course Home students in Scotland who did not pay fees at Scottish universities was a point of issue, and the European Court said that this was a British regional legal issue, which apparently means nothing, because we do not have a regional legal system in the UK. Others I am sure, like Douglas Connell, could explain that better than I even understand, and so she has written to ask what the position of the University of Edinburgh is with regard to this ruling. My understanding is that this is largely caught up with UK Government regulations and that the University will write formally back to Professor Wirz in due course, once they understand what the current Scottish Government and UK Government position on this will be. So I am not able to give you a response this morning. Can I invite any other questions from the floor or could I invite Dr Alan Johnston to give us any online questions?

Mr Alan Johnston: There are no new online questions.

Any member who does not have web access may request a copy from the General Council Office (email: general.council@ed.ac.uk)