

John Gabriel Byrne

(1933-2016)

Memorial Discourse

Trinity Monday 9 April 2018

Professor Jane Grimson

Fellow Emeritus and Pro-Chancellor

Provost, Fellows, Scholars, Colleagues, Guests and Friends,

“He was a quiet, retiring man who never sought to promote himself. It is likely that his association with a wide range of important work undertaken and promoted by him could easily fade with time and be forgotten” (Byrne and Fewer, p. 3).

This sums up John Gabriel Byrne perfectly but in fact it was written about his paternal grandfather, Thomas Joseph Byrne, an architect, in the introduction to a book entitled *“Thomas Joseph Byrne Nation Builder”* published in 2013. That publication served to ensure that the contribution of Thomas Byrne would not be forgotten. Fortunately, the book of reminiscences about John Byrne edited by Chris Horn and published last year has ensured that the enormous contribution which John Byrne made to Trinity and to Ireland is not forgotten. Chris Horn’s book was appropriately subtitled *“Father of Computing in Ireland”* which is no exaggeration. John Byrne with the support and encouragement of my father, William Wright, Professor of Engineering in Trinity from 1957 to 1985, led the development of Computer Science as an academic discipline in Ireland. Furthermore, like his grandfather, Thomas Byrne, John was motivated by a deep sense of patriotism – of public service. He also felt strongly that universities generally and Trinity in particular had an obligation not just to conduct research and to teach, but also to contribute to civil society in more than the purely economic sense. He gave generously of his time helping other universities and institutes of technology here to establish Computer Science departments, he also advised companies on the purchase of computers and played a key role in the early development of the ICT sector in Ireland. Under his leadership, the Department of Computer Science introduced numerous part-time programmes, aimed at building a base of skilled professionals. Many of them subsequently went on to play a major role in the public sector in Ireland, in attracting Foreign Direct Investment and in developing the indigenous ICT sector.

I hope I will be able to do justice to his memory in this discourse. I am very grateful to the dozens of people – both within and outside Trinity – who have provided me with invaluable information as well as many fascinating stories about John. I feel particularly fortunate to have been able to draw on John’s vast personal archive which he donated to the College and the recordings of a series of interviews with John conducted by Maurice O’Keefe in 2011 as part of the Irish Life and Lore Project (O’Keefe 2011).

I first came to know John as one of my lecturers in computer engineering in the late 60s and then as a colleague from 1980 when I was appointed to a lectureship in Computer Science. As with all new lecturers, he gave me the time and space to find my feet, prepare lectures and get my research up and running offering encouragement, but never interfering. Like so many others to whom I have spoken over the last few months, I owe John an enormous debt of gratitude for his unfailing support throughout my career.

I am not sure how John would react to being the subject of the Trinity Monday Memorial Discourse. He certainly never sought the limelight and disliked being the centre of attention. However, I am certain he would have been delighted to know that this year, for the first time, Fellows had the option of voting electronically for the election of new Fellows.

The discourse is divided into 4 sections. After a brief biographical summary, I will review the development of Computing as an academic discipline in Trinity, for which John can take full credit. This will be followed by a discussion of the key role he played in supporting the ICT sector in Ireland. The final section of the discourse will focus on John as an individual, his main interests and projects. He has left behind an important legacy not just for Trinity but for the country.

1 Biography

To begin with a brief biographical summary.

John Gabriel Byrne was born in Dublin on the 25th July, 1933, the only son of Thomas Brendan Byrne and Doreen (née Lawlor). His father, also a Trinity engineering graduate of 1924, worked for Dublin County Council for most of his life. The family lived in Rathfarnham for many years before John and his mother moved to Palmerstown in 1983 after the death of his father. John's great grand-father, Anthony Scott, was also a famous architect. His obituary in *Irish Builder* noted that *he 'probably designed and superintended the building of far more houses for the working classes than any other architect in Ireland'*. He was also responsible for the renovation of the Round Tower at Glendalough and designed the Celtic cross erected at Fontenoy in Belgium to commemorate the part the Irish Brigade played in the Battle of Fontenoy in 1745¹. There is a wonderful You Tube clip² of John speaking in carefully articulated French at an event in Fontenoy to mark the centenary in 2007

¹ <http://www.libraryireland.com/Atlas/LXXV-Irish-Brigade-Fontenoy.php>. Accessed: 22 March 2018.

² <https://www.youtube.com/watch?v=-Ta6IA179bw>. Accessed: 23 March 2018.

of the erection of the cross. It is clear that this family history of public service and of engineering and architecture had a strong influence on John.

John attended Loreto High School in Beaufort where his form teacher in Kindergarten, Sister Margaret, concluded in her report that *“John is very promising”*. How right she was! Subsequently, John attended Belvedere College, where, perhaps somewhat surprisingly given his future career, he concentrated on Classics. His performance in the Leaving Certificate was modest but must have been sufficient to allow him to matriculate and he entered Trinity College in 1952. He spent the first year studying French, Latin and Greek and attending lectures in Physics and Chemistry, while at the same time preparing for the special Mathematics entrance examination required at that time for admission to Engineering. In his interview with Maurice O’Keefe, John admits that he *“didn’t have to do anything”* in the first year to pass the Greek examinations; he added, with what must have been a twinkle in his eye: unlike the future Archbishop of Dublin, Walton Empey, who had not studied Greek prior to coming to Trinity and who therefore *“had to work like mad!”*. John was tutored by Victor Graham, a wonderful Mathematics teacher, to whom he always remained very grateful. Indeed, there are hundreds of engineering students – including myself - who have cause to be grateful to Victor. In acknowledgement of his contribution to the teaching of Mathematics, and much to John’s delight, the University awarded him an honorary ScD in 1989. John and Victor remained close friends until Victor’s death.

John passed the Mathematics examination and entered the Engineering School graduating top of the class with a First Class Honors Degree in 1956. He then went to work for Septimus Willis, a consulting engineering firm in Birmingham, who at that time had the contract to design the new Hogan Stand at Croke Park. He did not stay long with them for health reasons and on returning to Dublin applied successfully for a bursary to do a Diploma in Concrete Technology at Imperial College in London. The course was very mathematical and yet again Victor Graham provided assistance. It was at that time that John first heard about digital computers.

With the support of a bursary from the Expanded Metal Company in Birmingham, John started a PhD in 1957 with my father, who had just been appointed to the Chair of Civil Engineering and John was his first doctoral student here. His PhD, which was concerned with the mathematical modelling of the torsional stresses in hollow reinforced concrete beams, involved solving a large number of Partial Differential Equations – with only the help of a desk calculator. This work was to come in useful decades later in the design of the Lloyd Building! While attending a conference in London, John heard of Bernard Carré, a mathematician working at the Nelson Research Laboratories of English Electric at Stafford. Carré had developed a program for solving the type of equations with

which John was working. Carré was delighted that there was someone who actually wanted to use his program to solve a practical problem! John spent two summers there. It was his first practical experience of digital computers and programming, from which he would ultimately make his career. Carré and John subsequently published a joint paper on the work³.

John was awarded an Imperial Chemical Industries Research Fellowship in 1960 and was conferred with a PhD the following year. He was appointed to a Junior Lectureship in Trinity in 1963⁴, initially funded by the Graduate School of Engineering Studies and then as an established Lecturer in the School of Engineering from 1965. He was elected a Fellow in 1969 and appointed to the first Chair of Computer Science in 1973.

The Department of Computer Science was established in 1969 with John as its Head⁵, a position he held for 32 years until 2 years before his retirement in 2003; apart from a brief interlude of 3 years when he reluctantly served as Dean of the then Faculty of Engineering and Systems Sciences at the end of the 80s. He described the role of Dean at the time as being merely a “postbox used to send information from Front Square to the back of College”. During his period as Head, the Department grew from 3 academic staff plus one postdoctoral Fellow in 1969, to 22 a decade later, to 40 in 1989 and almost 60 today as the major component of the School of Computer Science and Statistics. There was a corresponding increase in technical, administrative and support staff. This was a large operation which John ruled virtually single-handedly. The only tasks he regularly delegated were Course Directorships, planning and executing the move from Pearse Street to the O’Reilly Institute in 1989 and - organising the annual Christmas party- which he attended.

When John retired in 2003 at the age of 70, he did not want any fuss. However, he was persuaded to allow the Department to host a dinner in his honour in the Davenport Hotel in March 2004. This was attended by over 160 past students and staff, many of whom had travelled long distances in order to pay tribute to someone who had played such an important role in their lives. The dinner was over-subscribed and many more would have like to attend. John greatly enjoyed the evening. A couple of years later, he was persuaded to have his portrait painted by a young and up-and-coming artist, Atsushi Kaga⁶, then a student at the National College of Art and Design which would have

³ Byrne, J.G. and Carré, B.A. Torsional Stress Concentrations at Rounded Corners of Rectangular Hollow Sections. *Journal of Mechanical Engineering Science* 4(4):334-340, December 1962. Available from: <http://jms.sagepub.com/content/4/4/334.refs>. Accessed: 24 March 2018.

⁴ Cox, Ronald. *Engineering at Trinity*. Dublin University Press, 1993 (page 116).

⁵ The Departments of Electronic and Electrical Engineering, Mechanical and Manufacturing Engineering and Civil Engineering were not established until 1980

⁶ <http://www.atsushikaga.com/> Accessed 18 March 2018.

particularly appealed to John. The painting⁷ shows John, with his typical wry smile, seated in the corner of the Common Room with one of the calculating machines from his collection on the table beside him.

After the death of his mother, Doreen, to whom he was devoted, in 1996, John continued to live alone in the house in Palmerstown. In October 2007, thieves broke in and John was badly beaten. Not surprisingly this had a major impact on him and represented a significant turning point in his life; his health started to decline. Understandably, he did not want to return to live in the house, so following a short period in rooms in College, he moved into a rented apartment in Mount St. Anne's in Milltown. Then as his health deteriorated further, he moved to Newtownpark in July 2012, initially in a bungalow and then into the main building in September 2014, where he died on April 16th 2016.

2 The early days of computing in Trinity.

I will now move on to discuss the early days of Computing at Trinity.

From the earliest days of the development of digital computers, my father saw the potential not just for their use in engineering to solve complex numerical problems, but also of their impact more widely. And in John Byrne he had a very willing accomplice. Together they put together a proposal to purchase the College's first computer in 1962. They managed to raise £5,000 from a variety of sources and persuaded College to provide an interest-free loan of a further £5,000 to make up the purchase price of £10,000 (O'Keefe, 2011). The IBM 1620 was delivered on 16th June, 1962 and had to be lifted by crane through the window of 21 Lincoln Place, now the location of the Dental School. UCD can claim the credit for installing the first computer in a higher education institution in Ireland; their 1620 was installed in March 1962, some 3 months earlier. However, Computing at Trinity, driven by the Engineering School, took off immediately whereas it was some years before it became established at UCD, where it was initiated and led by the Science Faculty⁸. Trinity under John's vision and drive was firmly established as the leader in the development of Computer Science as an academic discipline in Ireland. The following year, Board approved the establishment of the Graduate School of Engineering Studies "*to provide a service vitally necessary for the development of Irish industry*" (Cox, 1993, page 115). The School was to be self-financing and indeed it proved to be very successful running many short courses (Cox, p.115), which enabled the loan for the purchase of

⁷ <https://www.scss.tcd.ie/SCSSTreasuresCatalog/literature/TCD-SCSS-V.20180312.002/TCD-SCSS-V.20180312.002.pdf>. Accessed 18 March 2018.

⁸ <http://techarchives.irish/irelands-first-computers-1956-69/>. Accessed 22 March 2018.

the IBM 1620 to be paid back on time and College generously forgave the last payment. Since then the Department has acquired and replaced many machines and today provides computing services for well over 2000 staff and students.

In addition to the short courses aimed mainly at industry and the public sector, the Graduate School pioneered a number of programmes in computing at both Masters and Diploma levels. The MSc in Computer Applications, launched in 1963, was the first Computing Masters in Ireland and among the first in the British Isles and proved to be very successful (Wright and Byrne, 1964). It was also one of the very early taught Masters programmes in Trinity. It accepted graduates from any discipline provided they could demonstrate an ability in Mathematics.

Another pioneering programme and probably a first in Europe was the evening Diploma in Systems Analysis launched in 1968. This was particularly significant since it moved beyond the basics of programming to giving students an understanding how computers can be used effectively within organisations.

Yet another first followed in 1973 with the introduction of a Diploma in Computers in Education aimed at teachers. Initially, it took in around 20 students but this increased rapidly to at least 100 towards the end of the 70s when it looked as though the Department of Education was about to introduce Computer Studies as a subject at second level. However, it is only this year that Computer Science will be offered as a full Leaving Certificate subject, 45 years after John began advocating for its introduction.

Teaching on the evening programmes was typically provided by a mix of part-time hourly paid external lecturers who generally covered the more practical aspects of the programme and full-time academic staff who provided the more fundamental and theoretical aspects. In the course of preparing for this discourse I have spoken to a number of those part-time lecturers and they all uniformly say that they regarded teaching on these programmes as an honour and as a thank-you to John (many of them were earlier graduates of the respective programmes); they certainly didn't do it for the money!

The first undergraduate programme in Computing was introduced by John in 1966 when a Computer Engineering stream was added to the BAI in addition to the existing streams in Civil, Mechanical and Electrical Engineering. The Board Minutes record approval but note that any additional costs should

be met from the Engineering School Trust Fund⁹. The first graduates in Computer Engineering emerged in 1970 and I was one of that small class of 5.

1970 saw yet another next major educational innovation with the introduction of an evening degree, a BSc, in Computer Science. Reading between the lines of the Board and Council Minutes of the period, it is clear that the introduction of such a part-time evening degree was controversial. The original proposal, presented to Council in February 1970, was for a 3-year degree leading to an unclassified BA. Approval was eventually given for a 4-year pass BSc degree¹⁰. The first students were admitted in October of that year. It was a very demanding programme, especially as virtually all the students were in full-time employment. There was no funding available so it had to be run on a self-financing basis. The annual fee was extraordinarily high – £250 per annum at a time when the fee for the full-time Engineering degree was half that. However, in what one of the first graduates described as “*brilliant example of financial engineering*”, John deliberately targeted the public sector as well as a number of larger companies¹¹ for prospective students. And of course it was the State that paid the fees on behalf of the civil servants attending the course. The early graduates rose to very senior positions including Ray Bates, head of the national lottery; John Hinds, Head of An Post; and Sean Connolly, of the Revenue Commissioners.

In 1985, John was particularly delighted when my step-mother, Professor Barbara Wright, then Dean of the Faculty of Arts (Letters), suggested to John that the two Faculties collaborate and introduce a new undergraduate programme in Computer Science, Linguistics and a Language – the Languages on offer being French, German and Irish. The programme, known as CSLL, consisted of 50% Computer Science, 25% Linguistics and 25% Language. It had a small initial intake of 12 students per annum (later increased to 24). From the start, John worried about the students as even though they were bright many seemed to struggle. His concerns were justified when it became apparent with the introduction of ECTSs that the CSLL students carried a significantly greater load than their single discipline colleagues. The course took a few years to settle down and there were many heated arguments at examiners meetings, which John in his usual quiet way managed to diffuse. There were times though when it was like C.P. Snow’s clash of two cultures in action.

In understanding the history of Computer Science in Trinity it is important to examine the context in which the developments of the late 1960s were taking place – in particular the fact that they

⁹ Board Minutes 2nd November 1966

¹⁰ Council Minutes, 2nd March 1970.

¹¹ It is likely that the model for the course was based partially on the BComm degree programme offered by Trinity from 1925 to 1962. Both explicitly targeted the civil service with evening lectures to facilitate those in employment.

coincided with the announcement of “The merger”. On 18th April, 1967, the then Fianna Fáil Minister of Education, Donagh O’Malley unexpectedly announced his intention to create a single multi-denominational University of Dublin with two separate Colleges: UCD and Trinity (Luce, p. 185). According to him, the merger would save millions by removing duplication (Luce, 1992, p. 186). Opposition to the merger from all sides began to mobilise. The Board papers from the period make fascinating reading.

With a sense of “deja-vu”, the Van Vught report commissioned by the HEA and published in 2012 (Van Vught 2012) again proposed a merger between UCD and TCD, not to save money this time, but rather as a means of giving *“the merged college the critical mass and expertise needed to secure a place among the world’s best-ranked universities.”* Its recommendations, as with those of O’Malley and his successor, Lenihan, in the 1960s failed to gain support.

A key element of “The Merger” involved the reallocation of Faculties which included the proposal that Medicine would be located in Trinity and Engineering at UCD, and as can be imagined, neither side was happy (O’Keefe, 2011, Cox year, page 111-114). The strategy to justify the retention of Engineering in Trinity had two critical aspects to it. The first was that the approach to teaching Engineering at Trinity differed fundamentally from that at UCD. Specifically Trinity had a broad curriculum with common entry in which students were exposed to all aspects of engineering, with limited specialisation. UCD by contrast had denominated entry to the different engineering disciplines (Cox, 1993; page 113). The second aspect to the strategy centred on Computer Science, which was already firmly established as part of the Engineering School in Trinity. In 1969 it was therefore decided to create a separate Department of Computer Science with John Byrne as Head¹². It was the first in the Republic of Ireland and among the earliest in these islands. At the same time, the Computer Laboratory was established as an independent entity from the Engineering School with John Moriarty as its first Director, to provide a computing facility for the whole of College. And in order to emphasise the importance of the development of computing in Ireland, the then Minister of Education, Brian Lenihan, was invited to formally “open” the new computer, an IBM System 360/Model 44 to be managed by the newly established Computer Laboratory. The presence of the Minister at the opening undoubtedly helped to reinforce the perception, as well as the reality, that Trinity under John Byrne’s leadership, was leading the way in the development of this new discipline.

¹² Board Minutes, 11th June 1969

In the end, when the dust had settled, and a new Government was in power with other things on their mind, UCD retained Medicine and Trinity was allowed by the then Fine Gael Minister of Education, Dick Burke, to retain its Engineering School but crucially *“without capital investment”* (Cox, 1993, page 114; O’Keefe, 2011.) Assurances were given at the time that this ban would last only for a short time, although in the end it continued until the Manpower Programme was initiated at the end of the 1970s.

The Manpower Programme was introduced following the rapid success of the Industrial Development Authority (IDA) in attracting electronics companies to Ireland. The IDA had been established in 1970 with Michael Killeen at its head. Killeen was convinced that the electronics and pharmaceutical sectors were right for Ireland - and of course this proved to be correct. But the *“sheer scale of the employment needs of the electronics companies the IDA had [attracted]... presented an unexpected crisis”* (MacSharry and White, p. 283). The demand for engineers and technicians far outstripped supply. In an unprecedentedly rapid co-ordinated response by Government, the Manpower Programme was put in place with the HEA given additional funds – both capital and recurrent - to allocate for the introduction of special conversion courses and new or expanded courses in electrical engineering and computing (White 2001, page 187). Trinity’s Engineering School responded by increasing the number of students on the BAI degree and introducing a new specialist undergraduate degree programme in Computer Science. While I think it is likely that John would have preferred to see the students graduating with a BAI degree reflecting the strong engineering ethos of the programme, the decision was made that it would be a new Moderatorship with an initial intake of 60 students per annum, later to increase to 80.

In 1997, the Department responded to another Skills Initiative aimed at increasing the number of computing graduates nationally by introducing another undergraduate programme in Information and Communications Technology (ICT) with an annual intake of 80, later increased to 120. This brought in many new staff together with capital funding. However, only 3 years later in 2000, the *“dot com”* bubble burst and the number of students entering the undergraduate programmes in Computer Science, especially the new ICT degree, plummeted as did the points, leading to high failure rates in first year.

This was a difficult time for John but he kept insisting that the pendulum would swing back, which it did eventually. But the combination of the collapse of undergraduate student numbers, a challenging departmental review in which re-structuring was proposed, the abandoning of the plan for a new Computer Science building in the north east corner of the campus, and health problems, led him to step down as Head. He retired two years later in 2003, aged 70. John had built the

Department up from nothing to a successful and complex organisation. Much of the key information was in his head. Developing the future of the Department without John presented a significant challenge, but thanks to his vision and commitment, there was a solid foundation on which to build.

Research

Given the scale of the operation over which John presided, it is not surprising that he had little time for his own personal research. However, with his uncanny ability to foresee what was likely to be important in the future, John identified the potential of research funding under the newly established European Strategic Program on Research in Information Technology of the European Commission (known as ESPRIT) in the early 1980s. He actively encouraged participation by staff and facilitated the formation of a number of research groups which brought together academics working in similar areas creating critical mass, making it easier to apply for larger amounts of funding. The first Group to be established was the Distributed Systems Group under the leadership of Neville Harris, a close colleague of John's from the early 1960s and a life-long friend. Thanks to the many international contacts John had established, the Distributed Systems Group, or DSG as it was known, became incredibly successful at attracting funding from Europe. And other groups in the Department were able to leverage their success. John was especially delighted to discover that Trinity received the most funding under Esprit of any other European University. I think in some ways – and with apologies to my colleagues in Science - he was equally delighted when Computer Science's research earnings exceeded those of Physics for a number of years! He had a strong competitive streak when it came to issues that involved "his" Department!

The European funding was hugely beneficial at a time when there was very little national funding. It also played a significant part in the development of the Department itself. Up until then, the Department has focused principally on growing student numbers and teaching with significantly less emphasis on research. Under John's leadership, teaching and responding to national needs had been the Department's priority. New staff were virtually always recruited at lecturer level which resulted in a somewhat skewed ratio of junior to senior staff and a lack of experienced research leadership. The opportunity for younger staff to work in groups and with senior researchers from across Europe through participation in Esprit was vitally important in building research capacity in the Department and creating a better balance between teaching and research, which continues to the present day. The number of PhDs awarded in the Department, which is a proxy measure of research activity, went from 15 in the first decade from 1969, to just under 200 in the last decade. The latest rankings

place Computer Science in Trinity 1st in Ireland, in the top 25 in Europe and the top 100 in the world¹³. John Byrne contributed in no small measure to this achievement.

Campus companies

Given that the Department under John's leadership was very much at the forefront of computing, it is perhaps not surprising that some of the earliest campus companies spun out from the Department – even before there was a formal campus company programme in College. In 1976 shortly after Apple Computers was founded in California, John supported then Senior Lecturer, Lewis Leith, to take a career break and establish an Apple PC company in Ireland. Dr Leith went on to found SofTech, the first PC company in Ireland. One of the earliest official campus companies was IEunet established by Mike Nowlan and Cormac Callanan in 1991. IEunet was Ireland's first Internet service provider; yet again Computer Science in Trinity was at the forefront.

The best known spin-out was Iona Technologies created by Chris Horn and colleagues in 1991 and at its peak in 2001 employed 1200 people with 22 offices worldwide. It was acquired by Progress Software for about \$162 million in 2008. Another successful company was Havok, a leading provider of computer game technologies, founded by Hugh Reynolds and Steven Collins in 1998. It was bought by Intel in 2007 and then sold to Microsoft for an undisclosed sum in 2015. To date, there have been over 30 campus companies spun out from Computer Science. While John was not generally directly involved in any of them, he can certainly take full credit for establishing a supportive climate and environment.

3 National role

I will now turn to John's critical role in supporting the development of the ICT sector at national level.

John's contribution to laying the foundations for the development of Ireland as a major European – if not global – centre for ICT cannot be overstated. One of the rate-limiting steps for the emerging technology sector globally was and remains the lack of an appropriately skilled workforce. By his foresight and intuition, John developed the educational programmes which built a base of skilled professionals, thereby playing a major part in attracting ICT businesses to Ireland from the early

¹³ <https://www.topuniversities.com/university-rankings/university-subject-rankings/2018/computer-science-information-systems>, Accessed: 30 March 2018.

1970s to the present day. The courses which John established also helped to build capacity within Irish businesses and the public sector allowing them to transform and modernise through the use of ICT. They also played a key role both directly and indirectly in supporting the development of the indigenous ICT sector in the country.

John would always be available to meet IDA delegations from companies thinking of setting up in Ireland using the visits as opportunity for many of us to showcase our research. For many years, John was a member of various committees in both the IDA and Enterprise Ireland where his skills in identifying future winners were very much to the fore. As noted earlier, the IDA under Michael Killeen had identified electronics as a potentially fruitful sector for Ireland to attract Foreign Direct Investment. The initial focus was on manufacturing in which there had been significant successes, including for example Digital Equipment Corporation (DEC) in Galway in 1971, Apple in Cork in 1980, and Intel in Leixlip in 1989. However, John and a few others within the IDA, thought that software and ICT services were likely to become the areas of the future and that Ireland should seek to attract companies operating in these areas. John provided the IDA with critical evidence to support his prediction. And yet again, he was right and Ireland now has the European headquarters of many of the top software companies in the world. He thus played a central role not only in developing the skilled workforce for the growing ICT sector in Ireland but also in shaping the nature of the sector itself in the country.

4 John – the man

I've spoken about John's contribution both to Trinity and to the country. I now want to turn to "John, the man" – his personal attributes and interests.

The interviews with Maurice O'Keefe only occasionally provide insights into John's personal views. There is a particularly interesting exchange when Maurice O'Keefe asked him what the high points and low points of his career were. John singled out when he was appointed to the Chair of Computer Science, the O'Reilly Institute, and the campus companies which had spun out from the Department as high points, but had to be pressed for the low points: "*I don't think about those things*" he said. But he went on to express his frustration and disappointment when the plans to provide accommodation for the Department in the north-east corner of the campus on the foot of the capital funding provided by the introduction of the ICT degree fell through when "*somebody persuaded Tom Mitchell (the then Provost) to give it to someone else*" (The Science Gallery and CRANN). As compensation "*We got a few floors in what's called the Lloyd Institute*". The original

building had reached a sufficiently advanced stage of design that it featured on a bird's eye view of the campus through the ages by presented the artist, Michael Craig, to the Department to mark the Millenium. Even though he was clearly very unhappy with the decision, I would like to think that John would at the very least have acknowledged the subsequent successes of both CRANN and the Science Gallery. And as a keen follower of sport, I am confident that he would have approved of the Sports Centre.

As an aside there is an interesting story in relation to John's involvement in the design of the Lloyd. A crucial feature of the Lloyd from Computer Science's perspective was that there would be 4 tiered lecture theatres in the basement. But the design, much to John's irritation, showed a number of concrete pillars in the middle of the theatres. He returned his origins as a civil engineer and his PhD research, and did the calculations to show that columns were not required. And so today the students have John to thank for the fact that their view of the lecturer and screen is not obscured by unnecessary concrete columns!

The fact that the Department had not been physically housed together in the same building since the huts in Fellows Square were moved to make room for the construction of the Arts Building in 1972, was a great source of frustration to John. It also proved damaging to the Department as it made it difficult to develop a strong sense of unity and common purpose.

In addition to frustration with accommodation, John was also constantly annoyed by what he perceived as the unfair treatment of the Department. He felt that the Department never got its fair share of resources from College in spite of running several very profitable courses over many years and a staff-student ratio which was significantly worse than that of other comparable Departments.

John belonged to the old style of University Professor and Head of Department for life, retaining that role almost until he retired. It is difficult to characterise his style of leadership – perhaps benevolent dictator is the closest. He ran the Department virtually single-handed for over 30 years, never sought or wanted any credit, and always sought to act in what he felt were the best interests of the Department, its staff and students. In the evenings, he was often to be found walking around the Department talking to students and colleagues. Several former students have told me stories of how he would appear in their computer laboratory in the evenings when they were struggling with an assignment. He would happily sit down and help.

However you characterise John's personal styles of leadership and management, at times he would come across as quite secretive which led to a certain degree of frustration among colleagues. He was not a great fan of openness and transparency and it took a degree of persuasion in the 1990s for him

to agree to hold regular departmental meetings. Information flow at these meetings, typically attended by around 80 people, mainly consisted of John telling us what he felt we needed to know – and he was certainly right most of the time. He was not a supporter of student course evaluations and when these were first introduced in Trinity, he had to be persuaded to allow lecturers to see the evaluations of their own courses. This was done with the best of intentions as he did not want to upset those whose assessment were less than entirely positive.

He had a phenomenal memory which was aided by his famous – or from some points of view – infamous - little black book (in fact there were several of them) in which he would jot down key points at meetings. I was told by a senior member of the administrative staff that they used to dread when John would take out his little black book and refer to some note he had made months earlier which was at odds with what was now being said.

There can be no doubt that the rapid growth of Computer Science in terms of both staff and student numbers led to tensions within the Engineering School and it is therefore not surprising that when College decided to combine Departments into Schools, the decision was taken to establish a separate School of Computer Science and Statistics. Many of us, including, I suspect, John were disappointed with the split from Engineering although the rationale was clear.

John was painfully shy, never wanted to be in the limelight, but cared deeply about students, colleagues, Trinity and Ireland. His shyness beguiled a deeply caring nature – not for himself but for everyone else. He would also bend over backwards to assist students or staff who might be in difficulty for personal reasons – but always in a quiet way involving minimum fuss. He generously left money for the Student Hardship Fund in his will.

John had no great interest in his appearance. Many people regularly bought clothes for him and he had his own “personal shopper” in Kennedy and McSharry, long before such a role had been invented. I well remember one morning in the late 80s when he was due to play a central part at an event in the Provost’s House at 12 noon – I think it might have been when Tony O’Reilly was handing over the cheque for £2 million for the O’Reilly Institute. The then Secretary in the Department was desperate to ensure that he was properly dressed for the occasion and planned to take him over to Kennedy and McSharry that morning. But by 10:30 am there was still no sign of him. Eventually, shortly before 11 am he sauntered into the office but before the Secretary could say a word, John smiled and said *“I knew you’d tell me I needed a new suit”* and proudly held up his new Kennedy & McSharry suit bag!

He was passionate about the importance of education and never lost an opportunity to encourage others to further their education. He would be particularly delighted to know that his powers of persuasion were successful and two of his carers in Newtownpark, Jamie Murphy and Michelle Lambert are now both studying nursing in Trinity.

Unsurprisingly given his shyness, John was not particularly comfortable lecturing but he wrote everything on the board so it was possible to take down good notes. One former student described how John would conduct a *“parallel conversation with himself murmuring eclectic and often humorous comments....it was very like the way Glenn Gould, the famous Canadian pianist,.... could be heard singing along with his ..recording of Bach’s Goldberg Variations”* (Horn, 2017).

John’s projects

John was a man of many and varied interests from horse-racing to genealogy, history to architecture to mathematics.

I have selected two projects which I feel reflect the breadth of his interests and knowledge particularly well, namely the digitisation of the 1872 Printed Catalogue in the Library and the painting of the Weather Forecast Factory by Stephen Conlin.

The 1872 Printed Catalogue

John was a bibliophile – he had a vast collection of books covering all sorts of subjects. He had a particularly good eye for rare books of historical significance especially those relating to mathematics and computation. While a postgraduate student at Imperial College London in 1959, he purchased an item for £2 10s; another copy of the same item sold for \$170,500 in New York in 2008.

In 1986 Trinity hosted the then highly prestigious International Federation for Information Processing Annual Conference (IFIP) and John decided that it would be appropriate to stage a special exhibition in the Long Room entitled *“Computing through the ages”*. He put an enormous amount of work into curating the Exhibition, sourcing material from the College Library and the British Museum as well as from his own personal collection (Horn, 2017: Dan McCarthy). He set about trying to locate early mathematical publications in the Library, not an easy task as there was no on-line catalogue available for books acquired prior to 1872. There was only a printed one which was largely

organised by author – and with many of the entries in Latin, although with his classical education that didn't present a problem to John.

John describes the immediate motivation for the development of the digital version of the catalogue in his chapter in the book on the Library edited by Bill Vaughan (Vaughan 2013, p. 217).

"I was looking for an article on Pascal's calculating machine in the Encyclopédie. Rather than call for all twenty-eight volumes one by one, I was granted permission to go to the Long Room to find the volume I wanted. Finding it quickly, I could not resist having a look at other shelves. I came across a book [in Latin published in Padua] by [Balthasar] Capra, and on looking it up in a life of Galileo found that Galileo considered it a plagiarism of one of his books. Galileo was so incensed that he brought Capra before the university court in Padua, which ordered that all 483 copies be destroyed. The copy on the shelves of the library was one of thirty that escaped".

It occurred to John that there were probably many more such treasures to be found in the Library and so the project to produce a digital version of the 1872 catalogue was born. This was no routine project. The catalogue listed approximately 165,000 books in 9 volumes with a total of 5,374 pages in at least 14 different languages (Byrne, 2004). The original printed catalogue took almost 40 years to complete, the on-line version using principally student labour (Glynn Anderson, Andrew Collins, Brian Cullen, Brendan Culligan, Ruth Clarke, Donnla nic Gerailt and Mark Fynes) under John's supervision took less than 5 years. The languages of the entries included those using the Roman alphabet but also Hebrew, Syriac, Russian, Arabic and Greek with variations in typeface and in font size. This fact together with the particular layout of the catalogue required a bespoke Optical Character Recognition System to be developed. Once the catalogue had been scanned and converted into text, other students converted it into a searchable database with a simple user interface ultimately enabling on-line access opening up the Catalogue worldwide¹⁴. One particularly nice feature is that once the reader locates a book of interest, a screen showing an image of the entry in the original catalogue is displayed. The project has been justifiably described as *"a labour of love on the part of the late John Byrne"* (Jackson 2016, p. xxiv n.11) and he continued to work on enhancements until shortly before his death.

The Weather Forecast Factory

¹⁴ <https://www.scss.tcd.ie/misc/1872catalogueB/>. Accessed: 28 March 2018

In the same way that the digitisation of the 1872 Printed Catalogue reflected a number of John's personal interests and expertise, so too does the painting of the Weather Forecast Factory. To start at the beginning. One of John's major areas of research dating back to his time as a PhD student was the use of numerical methods to solve complex sets of equations. He was also passionately interested in the history of computation and computing devices and machines. Therefore it is perhaps not surprising that he had come across the work of Lewis Fry Richardson (1881 – 1953), an English mathematician and meteorologist, who pioneered the development of modern mathematical techniques of weather forecasting.

To coincide with the 1986 *"Computing through the ages"* Exhibition, he commissioned the Belfast artist, Stephen Conlin, who incidentally had studied Classics in Trinity, to paint a representation of Lewis Fry Richardson's Weather Forecast Factory which Richardson described in considerable detail in his book *Weather Prediction by Numerical Process* published in 1922 (Richardson, 1922).

Richardson was the first person to seriously and systematically attempt to use mathematical modelling techniques to forecast the weather. He tested his system by retrospectively forecasting the weather for a 6-hour period on a single day, May 20 1910. It took him 6 weeks to perform all the calculations by hand. Although the resulting forecast was completely wrong, it turned out that his method was sound and forms the basis of the forecasting techniques used today. Indeed we in Ireland have had cause to be grateful to Richardson, during the past 6 months what with Storm Ophelia, Storm Emma and the Beast from the East!

Given the length of time it took him to produce a forecast for just 6 hours, Richardson thought that there must be a more efficient way to perform the calculations. Hence his Forecast Factory in which he fantasises:

"Imagine a large hall like a theatre, except that the circles and galleries go right round through the space usually occupied by the stage. The walls of this chamber are painted to form a map of the globe. The ceiling represents the north Polar Regions, England is in the gallery, the tropics in the upper circle, Australia on the dress circle and the Antarctic in the pit.... A myriad of computers [note these are people – 64,000 of them rather than the machines we know today] are at work upon the weather of the part of the map where each sits, but each computer attends only to one equation or part of an equation. The work of each region is coordinated by an official of higher rank. Numerous little "night signs" display the instantaneous values so that neighbouring computers can read them. Each number is thus displayed in three adjacent zones so as to maintain communication to the North and South on the map" (Richardson 2007, p.219).

It is not certain why John chose Conlin as the artist but it is likely that he had seen a copy of the book *“One thousand years of Wood Quay”* by Jonathan Bardon illustrated by Stephen Conlin published in 1984 and admired the architectural detail in the illustrations.

It is clear that John had given very careful thought to the composition of the painting and provided the artist with detailed suggestions of who – the scientists - and what – the calculating devices - should be depicted in the painting.

The figure in the centre is of course Richardson himself. In the Research Department envisaged by Richardson, John positioned Percy Ludgate, who working independently had designed a novel analytical machine in 1909. Ludgate, who was born in Skibereen in Co. Cork in 1893, unlike Charles Babbage, has received little recognition for his pioneering work (Ludgate, 1909). John seems to have deliberately identified a number of unsung heroes for inclusion in the picture. For example, in addition to William Thomson, Lord Kelvin, John specified that his older brother, James Thomson, should be represented. He was an outstanding engineer serving as Regius Professor of Civil Engineering and Mechanics at Glasgow University and was a Fellow of the Royal Society and of the Royal Society of Edinburgh. In a similar vein, John’s sketch specifies that Ada Lovelace should stand alongside Charles Babbage’s famous Analytical Engine together with Lord Kelvin’s Tide Predicting Machine¹⁵ and the Mathematician, George Boole (McHale, 2014). Incidentally, the strange hemispherical “swimming pool” to the left was used for geophysical experiments by Sir Geoffrey Ives, George Boole’s grandson. Richardson even envisaged a recreation area for his hard-working “computers” : *“those who compute the weather should breathe of it freely”*. Thanks to John’s imagination and knowledge, the painting is a fascinating encapsulation of the history of computing from the early days of Babbage’s analytical engine.

As always, John never sought any publicity in relation to the painting and it was purely as a result of a chance meeting between Dan McCarthy of the Department of Computer Science in Trinity and Peter Lynch, Emeritus Professor of Mathematics and meteorologist at UCD that the existence of the painting became known to a much wider audience. Prof Lynch is a great admirer of the work of Richardson and was familiar with his proposed weather forecast factory. He was also aware of a few other attempts to provide a pictorial representation of the Factory. But nothing prepared him for the level of detail in Conlin’s portrayal which is due largely to John’s original concept and design. Prof Lynch has written widely about the painting in meteorology journals. The painting has just returned

¹⁵ <http://collection.sciencemuseum.org.uk/objects/co53901/thomsons-lord-kelvin-first-tide-predicting-machine-1876-tide-predictor>

from being on loan to an exhibition at La Cité de l'Architecture et du Patrimoine in Paris¹⁶. I am certain that this would have given John enormous pleasure.

Concluding remarks

I cannot end without mentioning John's passion for horse racing. He was a life-long racing enthusiast – attending race meetings regularly in Ireland and abroad. His interest in the sport can be traced back to his childhood. His maternal aunt was married to Nat Galway-Greer a highly successful breeder, success which continued after his death when his daughter, Betty, John's cousin, took over the family business. John was a regular attender at the Spring Show as a child in the company of his uncle and cousin. It is said that he had a knack for backing winners from an early age.

He loved gambling – not in the addictive sense but rather the calculation of the odds. His typical bet was €2! I was surprised to learn that in addition to betting on the horses, he also played slot machines and had discovered how to beat them. Apparently, with enough concentration and time (it takes about 20 minutes) to enable the player to understand the algorithm being used by the machine, it is not that difficult to win. By way of explanation he said: *"After all, they are only machines!"*. John was clearly motivated by the challenge rather than winning the money, in the same way that Richard Feynman figured out how to pick the locks on supposedly secure filing cabinets and safes in Los Alamos – not because he wanted to steal the atomic secrets that were inside but rather because he enjoyed the challenge.

John has left behind an invaluable legacy. He can justifiably feel proud of this legacy – although I am certain that is not a feeling he would apply to himself. He was deeply loyal to Trinity and to Ireland. His bequests to College include the John Gabriel Byrne Computer Science Collection – John's vast and historically significant collection of computing books and documents, slide rules, instruments, and machines which is currently housed in the O'Reilly Institute. It would be a fitting tribute to John if a suitable location could be found to display the collection on a permanent and publicly accessible basis - especially given the importance of computing to Ireland and the role that John played in its development. He also included a bequest to enable the purchase of additional material for the collection. He loved the Library and bequeathed a generous sum for the purchase of early printed

¹⁶ <https://www.citedelarchitecture.fr/fr/exposition/globes-architectures-sciences-explorent-le-monde>. Accessed 28 March 2018

books; the conservation of the Old Library (especially bay 'L') – which I understand contains mainly books about Engineering - and for the map Library.

While I can well imagine that without John Byrne, Computer Science would still have been established in Trinity but it would certainly have happened much later and in the absence of his vision and foresight would not have been nearly as successful and influential. As the “Father of Computing in Ireland”, his contribution to the development of the ICT sector has been enormous, both in terms of educating skilled professionals and pro-actively supporting the IDA and Enterprise Ireland to grow the sector.

John was a man of many talents and interests – and I don’t think any one individual knew the full extent of these. He’s been compared to a Russian matryoshka doll. However, in deference to his interest in knowledge of and passion for numerical modelling, I think he was more like a fractal! The more you find out about his interests, the more there is to find. He built the Department up from nothing, quietly and methodically, operating for much of the time under the official College radar. He was very protective – even possessive - of “his” Department.

Acknowledgements

In the course of preparing this discourse, I have spoken to many current and former colleagues of John, to friends and to family members. It has been an amazing journey of discovery for me and I have learnt things about John which I wish I had known when he was alive and could have discussed with him. I cannot thank everyone individually but I would particularly like to acknowledge the assistance of Dan McCarthy and Brian Coghlan, the curators of the John Gabriel Byrne Computer Science Collection, Peter Lynch from UCD for information about Richardson and the Weather Forecast Factory, the staff in the Manuscripts Library for facilitating access to the Board and Council papers from the 1960s and 1970s, Chris Horn for putting together the book of reminiscences, and to Edmund Williams, John’s cousin, representing the family. And finally I would like to thank Barbara Wright for her invaluable advice and support in the preparation of the discourse and of course, the Provost, for inviting me to deliver it. It has been a real privilege.

John had the sartorial elegance of Columbo, the shrewdness of Miss Marple, the ability to predict future technology trends of Bill Gates, but without the ego or the commercial drive! He was the absolute antithesis of the Computer Scientist envisaged in the article by Lord Goodman, a firm

champion of the Arts “*No whispered enhancements for the don*” in the Observer in June 1986 (Goodman, 1986):

“We are living in a computer-obsessed world. A man trained in computer science alone is by any definition an uneducated man; the enormous danger that looms over us is that we shall be satisfied to have a society trained to this limited degree and ignore or deride the necessity for the older notions of liberal education”

References

- Bromley, Alan (1982). Charles Babbage's Analytical Engine, 1838. *Annals of the History of Computing* 4:3 (1982), 196-217.
- Byrne J.G. (2004). The Trinity College Dublin 1872 Online Catalogue. In *Document Analysis Systems VI*, Proceedings of the 6th International Workshop, DAS 2004, Florence, Italy, September 2004, Marinai, S. & Dengel, A. (Eds) LNCS 3163, 17-27.
- Byrne, John and Fewer, Michael (2013). *Thomas Joseph Byrne Nation Builder*. South Dublin Libraries.
- Cox, Ronald (1993) *Engineering at Trinity*. Dublin University Press.
- Dictionary of Irish Architects 1720-1940*. Irish Architectural Archive. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs Available from : <http://www.dia.ie/architects/view/4764/SCOTT%2C+ANTHONY>. Accessed 4 March 2018
- Horn, C.J. (Ed.) (2017). *Professor John Byrne: Reminiscences. Father of Computing in Ireland*.
- Jackson, T.R. (Ed) (2016). *Frozen in Time – the Fagel Collection in the Library of Trinity College Dublin*. Lilliput Press.
- Lord Goodman (1986). *No whispered enhancements for the don*, Observer, 29 June.
- Luce, J.V. (1992) *Trinity College Dublin The first 400 Years*, Trinity College Dublin, Press.
- Ludgate, Percy (1909). On a proposed analytical machine. *Scientific Proceedings of the Royal Dublin Society*. 12 (9): 77–91. Available from: <http://www.fano.co.uk/ludgate/paper.html>. Accessed: 24 March 2018.
- Mac Sharry Ray and White, Padraic. (2000). *The Making of the Celtic Tiger. The Inside Story of Ireland's Boom Economy*". Mercier Press, Cork.
- McHale, Desmond (2014). *The Life and Work of George Boole: A Prelude to the Digital Age*. Cork University Press.
- O'Keefe, M. (2011). Interviews with John Byrne. Irish Life and Lore. Available from <https://www.irishlifeandlore.com/product-category/recordings/thematic/education/>. Accessed 9 March 2018
- Richardson, L.W. (1922) *Weather predication by digital process*, Cambridge University Press.
- Richardson, L.W. (2007) *Weather predication by digital process*, 2nd Edition, Cambridge Mathematical Library.
- Van Vught (2012). *A proposed Reconfiguration of the Irish System of Higher Education*. Report of the International Expert Panel for the Higher Education Authority of Ireland. Available from: <http://hea.ie/assets/uploads/2017/04/International-Panel-Report-on-Reconfiguration.pdf>. Accessed: 23 March 2018.
- Vaughan W.E. (2013). *The Old Library Trinity College Dublin 1712-2012*. Four Courts Press
- White, Tony. (2001). *Investing in People Higher Education in Ireland from 1960 to 2000*. Institute of Public Administration.
- Wright, W. and Byrne, J.G. (1964) MSc Course in Computer Applications at Trinity College. *The Computer Bulletin*, 8:2, September 1964.