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Lawrence Ernest Lyons 1922–2010

John W. White

Research School of Chemistry, ANU, Canberra, ACT 2601, Australia. Email: jww@rsc.anu.edu.au

Lawrie Lyons was a person of vision with a will to initiate and follow-through. This characteristic was evident in his scientific agenda, in his academic and Christian actions and in the care that he had for his family. These strands are inextricably woven in the texture of his life, some of which I have known since I met him as tutor before entering Sydney University in 1954—but afterwards as his research student and as a friend and collaborator. It is from these perspectives that I write this biographical memoir.

Introduction

Lawrence Ernest Lyons was born in Sydney in May 1922. Inspired by his grandfather, a school teacher, he had a strong academic bent, which appeared at Sydney Boys High School, where in 1938, he was the top student in chemistry in the Leaving Certificate examination—gaining a Liversidge Scholarship to Sydney University.

Entering Sydney University in 1939 at the age of 16, and unable to decide between medicine and science, he took subjects compatible with both but gravitated to chemistry, winning the Caird Scholarship in 1942. War had been on 3 September 1939 and Australia's response to the lack of necessary imports from Britain and Europe, for domestic and war purposes, was to mobilize the universities' help. Professor Ashby (later Sir, and then Lord Ashby—as Master of Clare College, Cambridge), in 1939 Professor of Botany and Scientific Liaison Officer for Australia, assembled all of the science undergraduates in front of the Bank Building in Science Road to tell them that they would be required during and after their University courses to help in this work. This was not centrally organized, it was up to each student to find a company with whom they could work according to their scientific skill. The academic years were shortened at that time and Lyons found a job with G. E. Crane and Sons in Concord, Sydney, makers of taps and plumbing equipment in their foundry. Australia had decided to build the Wirraway fighter aircraft for its own defences and duralumin (a mixture of aluminium and copper) was required for that work. The company set about producing this. Having no previous experience in that metal they were the first in Australia to make it. When Lyons arrived they were having trouble but after

contacting British Aluminium for help, success was achieved and sheets of duralumin sent to Melbourne to make aircraft.

The academic career of all those graduates was interrupted by the war and Lyons was subsequently awarded his Bachelor of Science degree in 1943. Lyons entered the Royal Australian Air Force (RAAF) as a trainee navigator, got some flying experience, but mostly was very bored—having been deemed to be a better navigator than pilot. After the war he went straight into the University as a lecturer as a lot of students were enrolling, including many under the Commonwealth Reconstruction Training Scheme. He was ready for research as an Honours student with Thomas Iredale[1] who had worked with Goodeve at University College London (UCL) on gas

phase reaction kinetics. This was a prime subject in physical chemistry at that time in London, Cambridge and Oxford (where Hinshelwood and Lindeman subsequently shared the Nobel Prize). Lyons' research project on the effect of isoelectronic carbon monoxide and nitrogen on the kinetics of decomposition of chlorine dioxide required all of his experimental skills—particularly in the construction of the soda-glass apparatus without the help of a glassblower. No effects were seen in the kinetics experiment—possibly because the carbon monoxide molecule dipole moment is very small.

It was at this time also that Lyons became interested in the electrochemistry[2,3] of organic molecules, using the dropping mercury electrode polarography, for which Heyrovsky (a UCL graduate) was given the Nobel Prize in 1959. It is clear he maintained an interest in polarography into the 1950s from his publications, his research interests as a PhD student at University College London and his organization of meetings with Hugh McKenzie FAA, then at Sydney University, subsequently at the Australian National University.

Science

The academic career of Lyons overlapped that of David Craig at Sydney, UCL and subsequently. David Craig had been a near contemporary at Sydney University, had a distinguished war career and preceded Lyons at UCL for his PhD as a Turner and Newall Fellow. His PhD completed in 1949, Craig became a lecturer there until 1952 before moving back to Sydney University as the first Professor of Physical Chemistry. When I was a student at Sydney University, it seemed natural that chemistry students would go to University College for their PhD. Lyons went there in 1948 for his PhD, having been a lecturer at Sydney since 1946 and taking an MSc and BA there. He became a British Ramsay Scholar for 1952–3 with PhD in 1952.

That period was seminal for his contributions to the science of semi-conductivity and photoconductivity in molecular crystals. The thread of this interest, which developed into a major effort to make practical devices for solar energy capture in the 1970s, can be traced back to his interest in the polarographic reduction of organic molecules[4]. This paper expounded the correct relationship between the polarographic electron transfer potential and the electron affinities of aromatic molecules—taking into account the solvation energy, derived theoretically by Hush's method.

The complementary thread, on the spectroscopy of molecular crystals was started in his PhD thesis (1952) on 'Assignment of some Electronic Transitions in Benzenoid Molecules'. It must have been an interesting time at UCL then as Craig and Hobbins were soon to publish their definitive papers in the *Journal of the Chemical Society*[5]. Lyons' second *Nature* paper (with Craig)[6] showed the value of polarized optical spectroscopy for assigning the symmetry of the electronic states in molecular crystals[7] and demonstrated the effects of the intermolecular electronic coupling of crystalline excitations. Throughout Lyons' work between 1955 and 1970 there was this recurring interest in electronic transfer to and between molecules[8] as well as molecular crystal spectroscopy[9]. David Craig had come to Sydney University in 1953 as the first Professor of Physical Chemistry and was soon joined there by Ian Ross and Lawrie Lyons as lecturers. This trio established optical spectroscopy as a key activity at Sydney though Craig returned as Professor to University College London in 1956.

Lyons continued some polarographic work, helping to organize the Australian polarographic conferences in June 1950, 1954 and January 1964 but his focus had changed to the spectroscopy of molecular crystals and the use of Davydov theory to describe electronic excitations in oriented molecular crystals. Anthracene, naphthalene, tetracene and other molecular crystals were systematically studied at low temperature and the excitonic transition splittings calculated using the known crystal structures. The Davydov theory used a dipole–dipole approximation for the electromagnetic coupling of molecular electronic excitations. It was typical of Lyons to wish to see the extent to which this approximation was valid and a study of the polarized single crystal spectra of phthalocyanine was the method. The project tested the theory because the molecule is big and close packed so the contribution of higher moments in the electromagnetic coupling should contribute to the splittings observed. The project was hard because of the high oscillator strength of the electronic transitions and the difficulty of obtaining very thin crystals to allow optical spectra to be measured. The goal was achieved and it showed

the value of pushing limits—an aspect of science and public life that Lyons esteemed—a limit was a challenge.

At the same time Lyons started his pioneering work on organic photoconductivity and semi-conductivity with his third *Nature* paper[10]. Thirteen papers with Bree and Morris followed in quick succession between 1955 and 1957. The experiments were very difficult but clearly established the basis of molecular crystal photoconductivity. For example by measurements of 'action spectra'—where the photoconductivity was measured as a function of optical wavelength, a clear relationship was demonstrated between the optical absorption spectra and the photoconductivity. The paper in 1957[11] brings together ideas on photo- and semi-conductance of molecular crystals. The series continued (mostly in the *Journal of the Chemical Society*) and consummation as a text book 'Organic Semiconductors' published with Felix Gutmann from the University of New South Wales in 1967[12]. The state of the art then was summarized by the authors:

> the central problem in the study of organic semiconductors is to understand how electric charge enters and is transported through a molecular and often highly disordered solid over distances which are very large on an atomic or molecular scale – a problem which touches on a very wide spectrum of other fields of science, especially those in the realm of biology. A borderline field is always very fertile with results applicable to many other fields of research, and organic semiconductors seem unlikely to be an exception ….
>
> and went on:
>
> … It has become increasingly clear to us that, although this is one of the first 'comprehensive' books on the subject, it can only be considered as describing a base for further efforts. If it spurs such efforts, we shall be well satisfied.

The book was well received and Melvin Calvin (Nobel Laureate for Photosynthesis) in his foreword[13] said:

> The early electrical work in the field was later done on phthalocyanine by another student of Polanyi of that same period, D.D. Eley. Lyons came to the subject about that time, but by a different route. His interest lay in the optical spectroscopy of organic molecular crystals, particularly those such as anthracene. In the course of the evolution of his concept of molecular interaction in order to understand the crystal spectra it became clear to him that ionization phenomena and electronic migration must play a role in the understanding of these spectra. This, in turn, led him to concentrate on the electrical measurements of organic molecular crystals, and it is entirely fitting that he and Gutmann should be the authors of the present volume. No one is better suited both by temperament and experience to produce this definitive discussion of the present state of organic semiconductors, both in theory and in experiment. Gutmann and Lyons have been among the central contributors to the development of both the theory and the observation, and this exposition which only they can make is likely to remain an extremely important bench mark in the history of the field, no matter how fast it changes.

The vision of this work was cheap organic materials for the generation and capture of light conductivity—a vision that has been realized with polymeric semiconductors in the last 20 years. In relation to this interest in the 1960s and 1970s, Lyons had a number of fruitful collaborations in Japan and the USA as well as an invitation to visit China. Prestigious lecture invitations included the Liversidge Lecture Royal Society NSW 1966, HG Smith Medal of the Royal Australian Chemical Institute 1968, the Liversidge Lecture of ANZAAS 1976, the Leverhulme Senior Fellowship with Professor Hideo Akamatzu at the University of Tokyo in 1970 and the Debye Lecture, Cornell University 1979.

Lyons' move to the University of Queensland in 1963 to take up the first Chair of Physical Chemistry saw the continuation of photoconductivity and spectroscopic work with a new interest to make photovoltaics using inorganic semiconductors such as cadmium sulphide and telluride produced electrochemically. These looked to be easily produced, practical materials for light harvesting solar cells. My interview for the Academy of Science with Lyons[14] in 2008 reflects some of the trials and tribulations of the move and his skilful collaboration with Professor T. E. Jones to circumvent university politics at Queensland and establish for the first time a separate building for the whole of chemistry.

For the photovoltaic work, Dr Graeme Morris, one of his colleagues from Sydney University, moved with him to Queensland. Production of durable, high efficiency cells was anything but easy. The *Nature* paper with W. J. Danaher[15] (1978) described the improvement of photocurrents from *p*-CdTe films deposited

cathodically by removing excess free tellurium and by increasing the crystalline size of CdTe. This electrochemistry gave purer CdTe than commercial 99.999% purity crystals and was patented. Over the period 1978 to 1987, twenty-four publications, identified in the Supplementary Material (available online), aimed to change the chemistry and increase the photovoltaic efficiency of electrochemical and CdS evaporated films treated with Te vapour to increase the hole content. Secondary Ion Mass Spectrometry (SIMS) was an essential tool to monitor 'inclusion in films, of impurities from the source material', and 'any contamination from the heat treatment'. Surprising amounts of alkali, alkaline earth and Group III elements as well as halogens were found and proved to be an impediment to high efficiency and resistant to elimination by heat treatment. Doping with phosphorus or arsenic reduced the dark current film resistance of the chalcogenide but the effect was muted by the effect of 'at least 16 impurities from the source material'. Eventually the work involving solutions was done in Teflon vessels—so great was the take-up of ionic material from glass (see interview above). Photovoltaic yields increased from about 3% to 11% as the limitations imposed by texture and impurities were addressed. The Brisbane Surface Analysis Facility established in the Chemistry Department played a big role in the whole campaign and was made accessible to all other laboratories in the region.

Appendix 1 is the chronology of Professor Lyons' academic and personal career highlights and a full list of his publications is available as Supplementary Material.

Science Policy and Education

Lyons' report of the Academy of Science Committee on Solar Energy Research in Australia[16] was early advocacy to the Federal Government to support alternative energy projects. Through his Chairmanship of the University of Queensland Solar Energy Committee, and the shift of his research to find low-cost high-efficiency photovoltaic systems, he had committed himself to this direction.

Before leaving Sydney University for Queensland, Lyons was the chairman of the syllabus committee and chief examiner for high school chemistry in NSW for several years. In his period as chairman, the school syllabus underwent its first major overhaul since 1912.

He was also sub-Dean of Science at the University and a persistent advocate of the need for robust support of basic chemical research in Australian Universities. In the citation for his election to the Australian Academy of Science, it was said that:

> He was one of the first if not the first to advocate the setting up of a Science Advisory Council and a national fund for scientific research. In this connection he made a personal submission on 29 August 1960 to the Committee on Higher Education in N.S.W. suggesting support for the formation of a National Science Foundation, and he wrote an article for the leader page of the Sydney Morning Herald of 15 March 1962 calling for both a Science Advisory Council and a National Science Foundation. He was the organizer of the A.N.Z.A.A.S. Symposium on "Federal Aid for Scientific Research in Australian Universities" held at the A.N.Z.A.A.S. Congress in Sydney in 1962. Lyons's report of that meeting was published in Aust.J.Sci.201 (1962). The meeting passed a resolution forwarded by A.N.Z.A.A.S. to the Federal Government asking for the establishment of a National Science Foundation. With Dr (now Professor) I.G. Ross he wrote the Current Affairs Bulletin "Science in Australia – A.N.Z.A.A.S. Anniversary" 13, August 1962 where the same ideas were developed. Various submissions to Federal bodies originated from the University of Sydney and its Faculty of Science, of which he was then Sub-Dean these developed the same theme. They were written in 1960–64 basically by Lyons and Dr I.G. Ross. Since then both the A.R.G.C. and A.S.T.E.C. have come into existence, as a result of the activities of many individuals, amongst whom Lyons and Ross were early advocates of change. National policies for Science were discussed further by Lyons in his Presidential Address to the Australian and New Zealand Association for the Advancement of Science (A.N.Z.A.A.S.) Chemistry Section, in 1967.

He and Professor I G Ross (FAA) promoted this need initially[17] in 1964 by drawing attention to 'Government Support for Scientific Research in Canadian Universities'. In his Presidential address to the ANZAAS Chemistry Section in 1967, he re-made the point and in 1968 once again as Chairman of the Committee of the Federated Australian University Staff Associations 1968 (Report on Research in Universities).

Academy and Queensland Scientists

Lyons was elected a Fellow of the Australian Academy of Science in 1971 for his contributions to molecular crystal spectroscopy and organic semi-conductivity. After moving to Queensland he became aware of the scientific quality of research there. The Universities of Queensland had received major endowments from Chuck Feeney's The Atlantic Philanthropies for medical science. The State Government's strong support for University research aspirations and the influx of new staff and higher student numbers all combined to produce diversified excellence in the 1980s and 1990s. This focused his mind on the desire for greater recognition by the premier Australian science body, the Academy of Science, so he lobbied the Academy in the 1990s for this. His memorable speech and correspondence with various Presidents from Professor Craig onwards is part the Academy's record.

It would have been a great pleasure to him—if he had lived—to see the headlines, published by the University of Queensland as 'UQ Tops the Country for the Number of Prestigious Science Fellows' subsequent to the March 2013 Academy Fellowship election[18]. Eight Queenslanders were elected to the Academy that year.

The Fellowship campaign was a typical Lyons project, a goal-setting–achieving exercise. This approach was, on the whole, successful but sometimes didn't work. An example of failure was the response to his conviction and lobbying to attract an information technology manufacturing base to Australia. The grounds were that 'Australia has no capability of manufacturing the most important components of computer technology. Our workforce consequently is without skills in this area'. A letter to *The Australian* in 1997 (Appendices 2 and 3) sets this out in connection with the then forthcoming Goldsworthy report.

He wrote to the Minister for Communications, Information Technology and the Arts, the Hon Darryl Williams AM QC MP, about this on 8 May 2004 pointing out Malaysia's export of billions of dollars and Australia's import bill of the same cost to meet the need for the basic components of information technology—such as programmable chips. In his submission he suggested that the CEO of Intel, Craig Barrett, be approached about the terms under which INTEL might invest something like $8 billion to set up an Australian facility. He estimated the employment prospects of such an investment and the value of such exports as being comparable to coal and tourism.

In 2003 he had made these matters known to Senator Alston (then Minister for Communications, Information Technology and the Arts) but had been told that the Treasurer was not favourably disposed to attracting INTEL to Australia through, for example, a ten-year tax break. Minister Williams response on 16 July 2004 directed Lyons toward InvestAustralia as the appropriate vehicle to make the advance to INTEL. This suggestion stimulated a second letter sent to the Minister on 13 August and, not giving up, Lyons then approached the local member, Michael Johnson MP to take up the cudgels. Johnson said that he was working hard behind the scenes to draw the attention to the Minister but nothing was forthcoming—a project which failed.

University Colleges

With the great growth of Australian universities in the 1960s and 1970s, Lyons conceived a major project[19]. Some of the story of this is given in the Academy interview (already cited). The aim was to achieve two new halls of residence at the University of Sydney and fully fledged student residential colleges at the University of NSW and at Macquarie University. The accounts are typical of the vision and persistence of Lyons as well as his 'merry' methods when confronted with difficulties.

Briefly, the initial aim was to get a new College at the University of Sydney but he was frustrated in this. He and two close friends in the Anglican Archdiocese of Sydney became aware, however, that 99-year leases on the Glebe estate of the Anglican Church would be due for renewal from the 1950s onwards and that the University Hotel and the Kentish Hotel—insalubrious pubs near the north east corner of the university—were leases that would soon be due for renewal. The Vice-Chancellor of Sydney University, Stephen Roberts, had his eye on these for overspill of university administration but Lyons and his colleagues camped in the buildings when the leases were due and let it be known to the press that this was being done to provide more

Figure 1. Andrew Lyons, Professor Cairney (Master of New College, UNSW) Alison Lyons, Lawrence E. Lyons at Life Fellowship Ceremony, New College 2008.

accommodation for the students—thus providing a potential *cause célèbre* for Roberts if he were to displace them for more administration space.

> The camping was disagreeable because of the rats and the smell of beer but de-ratting was done by persuading a clergyman to put on his clerical collar and get otherwise unavailable thallium-based rat poison to spread around. (Approaches without the clerical collar had previously been refused to Lyons and others by the chemist because of recent murders using Thalrat). The move was successful and a Council for Colleges at the University of Sydney was set up under the auspices of the Archdiocese of Sydney with a rent of one shilling per student per night. This embryo project allowed further col- lege expansion to be made by bank loans, through sale of the refurbished hotels and, ulti- mately, through the positive response of Sir Philip Baxter (Vice-Chancellor of the Univer- sity of NSW) for New College to be built on Anzac Parade at the entrance to the University of NSW, with a subsequent venture Menzies College at Macquarie University. These continue to be flourishing institutions.

On 12 December 2008 when Lyons and his wife Alison were made Life Fellows of New College in the University of New South Wales (Fig. 1), the College's Master Professor Cairney said:

> Dr Lawrence Ernest Lyons was a driving force in the formation of NUCC. Lawrie, as he is known, has been described as the 'engine driver' in the formation of NUCC. He was also described as the 'ideas man' and the 'prime mover', one early member commented that he dominated NUCC and forced the pace on every issue.

Christian Belief and Science

Lyons became a Christian at the age of 15 and was never content to rest on a solely private conviction but contributed as much as he could through committees and projects to get a better understanding of his faith and of the relationship between science and Christianity and apply that understanding. In this regard, the British influence on an Australian scientist manifested itself in another way, Lyons drew inspiration also from Michael Faraday's endeavours to practice his Christian faith as well as excel in science.

When in Britain, Lyons had come to know Dr Oliver Barclay who formed the Research Scientists Christian Fellowship (RSCF) within the framework of the Inter-Varsity Fellowship. This was an organization started by former members of the Evangelical Christian Unions of Cambridge, Oxford and London. These people believed that their faith was not incompatible with science and that there was no conflict—as had been perceived from the nineteenth century debates about evolution. Charles Coulson, the Rouse-Ball Professor of Mathematics at Oxford said that scientists were thinking God's thoughts after him. Lyons and others started the Sydney RSCF group that met in the 1950s and 1960s and held well-attended student conferences for them to participate in the faith-science discussion.

Out of this group, Lyons established in 1988 a group called ISCAST[20]—Institute for the Study of Christianity in an Age of Science and Technology—whose aim was to research science/faith questions in the context of new scientific discoveries and scripture. Similar groups of academics were established in Britain and the USA. For ISCAST, the academic and Christian standing of its Fellows was of prime importance in their election to the Institute. Lyons was the first President of the Institute and incorporated it as a public company.

Naturally there were projects; the first, an Enquiry Centre open for public question and debate, then lecture tours by distinguished academics from Australasia and overseas—funding for which being raised by the membership. The speaking tours of these visitors are still organized by local chapters of the Institute. Other projects on environmental questions led to a letter (1990) to the Academy of Science's Science Policy Secretary, asking that the Academy become an honest broker to advise the people and their governments in a scientifically knowledgeable and fair-minded way. ISCAST has grown, has an active website, regular national conferences and now 48 Fellows and many Associates throughout Australia.

Family

Lyons and his wife Alison were married for over 50 years. Both are now dead but their son Andrew, in the funeral oration for his father in October 2010, said: 'They both chose wisely and it was a very happy marriage. They were a great team. In particular, they were both highly academically minded people who relished constructive debate and independence of thought'. Andrew said that in reviewing his childhood and his relationship with his father, he had no complaints at all. 'The rear vision mirror is full of happy memories and unalloyed gratitude. He was a superb father—he sought to impart good values to us, some by instruction but mostly by that most persuasive of all media, example'.

The great tragedy of Lawrie and Alison's life was the early death of their second son Hugh—a person very like Lawrie in many ways. It was a sorrow endured by both throughout their life but not a public sorrow. In his oration Andrew Lyons observed that Lawrie was physically very courageous. 'He and I, and perhaps Hugh, when entering Baker Street tube station, observed two thugs beating the hell out of a victim they had overwhelmed. Everyone else was giving the thugs a wide berth. Dad's reaction was otherwise. Immediately and without warning, he charged into the fight to force the thugs away from their helpless victim. Fortunately, the thugs did not turn on him. They had had their fill of violence, at least for the minute, and left.'

Andrew concludes his eulogy 'How does one sum up such a life? From the point of view of his faith, I have no doubt that he has been greeted now as a good and faithful servant. From my perspective to the day I die, I will identify myself as his son, with great pride'.

Bibliography

A full bibliography of scientific publications by Lawrence Ernest Lyons is available online as Supplementary Material to this paper.

Appendix 1. L. E. Lyons Career Chronology—Selected Highlights

1939	Liversidge Scholarship, University of Sydney
1942	Caird Scholarship
1943	BSc Hons, University of Sydney
1943	Leader, scientific research team developing aluminium alloys for the RAAF for the manufacture in Australia of Wirraway aircraft
1944–5	RAAF
1945–63	Lecturer, Snr Lecturer, Reader, University of Sydney
1948	BA and MSc, University of Sydney

1950	British Ramsay Fellow for Chemistry
1952	PhD, University College, London
1957	Research Fellow, Harvard, Cambridge Mass. Harvard Corp. appointment
1957	Fulbright scholar
1958	*First-order Calculation of Factor Group Splittings in the Electronic Spectra of Durene, Ovalene and Phthalocyanine Crystals*, published by Journal Chemical Society
1962–81	Member, Standing Committee on Spectroscopy, Australian Academy of Science
1963–87	Professor of Physical Chemistry, University of Queensland
1964	DSc, University of London
1964	Lecture tour of China by invitation of Chinese Academy of Science
1966	Liversidge Lecturer, Royal Society, NSW
1966–68	Member of the editorial board of *Molecular Crystals and Liquid Crystals*
1967	*Organic Semiconductors* (co-authored with Felix Gutmann), published by Wiley
1967	President, ANZAAS Chemistry Section
1967	Visitor, Chemistry Department, Oxford University Visiting Professor, University of British Columbia
1967	Lectures in Mendeleev's lecture room
1967–77	Member of the editorial board of *Chemical Physics Letters*
1968	H. G. Smith Medal of the Royal Australian Chemical Institute
1968	Walter Burfitt Prize of the Royal Society of New South Wales
1970	Leverhulme Senior Fellow, University of Tokyo
1970	Pirate edition of *Organic Semiconductors*, published in USSR
1971	Elected Fellow, Australian Academy of Science
1976	Liversidge Lecture, ANZAAS
1978–81	Member, National Energy Research Development & Demonstration Council (Australia)
1979	Debye Lecturer, Cornell University
1979	Fulbright Scholar
1979–82	Standing Committee of Professorial Board, University of Queensland
1980	Founder Brisbane Surface Analysis Facility
1981	*Organic Semiconductors* Part A (co-authored with Felix Gutmann), published by R. E. Krieger Publishing Company
1982–4	Member, Australian National Commission, UNESCO
1983	*Organic Semiconductors* Part B (co-authored with Felix Gutmann and Hendrik Keyzer), published by R. E. Krieger Publishing Company
1985	Visiting Professor University of Waterloo, Ontario, Canada
1986	Visiting Fellow, Clare Hall, Cambridge
1987–2010	Professor Emeritus, University of Queensland
1988	Founder & Director of Institute for the Study of Christianity in an Age of Science and Technology (ISCAST Ltd)
1960–87	Founder & Director/Member, New University Colleges Council Ltd, Sydney
1969–71	Founding Chairman, Establishment Committee of Kenmore State High School, Brisbane
1972	First President of the Kenmore State High School P&C Committee
2008	Life Fellow, New College, University of NSW

Appendix 2. Attracting Information Technology Industry to Australia

Letter to *The Australian*:

Lawrence Ernest Lyons
To: ausletr@newscorpcom.au Cc: John White
IT Policy

2172 Moggill Rd
KENMORE 4069
27th June 1997
The Editor
The Australian.

Dear Sir,

You report (24/6; p.31) the Managing Director of IBM Australia as saying that Australia has missed the boat with its own IT industry. Up to today he is quite correct, as is seen easily by comparing Australia with either Singapore or Malaysia, let alone Japan or USA even after correcting for population differences.

The future, however need not be so bleak. If Australia were to emulate and outbid eg Singapore in attracting a dozen multinationals to these shores with each investing $2 billion of its own money the result would be more than 100 000 new jobs, and a turnaround in our balance of payments.

Is such a remarkable result actually possible? Yes indeed. It will be discussed in the Goldsworthy report commissioned by the Honourable John Moore, on the future of our IT industries to be published in August next. The actions already taken to attract IT industries to Singapore, Malaysia, Britain. Ireland and Israel are listed in a submission to the Goldsworthy committee entitled "Australia • Spectator or Serious player?" available from OIST.

Because the multinationals put new plants where they will be most profitable, the Australian government still has the chance to get them here in future years when the industry will continue to grow rapidly. Removing tax and other government imposed impediments for say ten years could be sufficient incentive for Australia to move to the front line. Such actions would clear the playing field of obstacles placed there by past governments.

Yours sincerely,

(Emeritus Professor Lawrie Lyons, FAA)

Appendix 3. Correspondence with Australian Academy of Science re INTEL

To:l Lyons

Re: Meeting with Chief Scientist 14 October 2000 9.49 am

Dear Lawrie,

Thank you for the message. I regret that I cannot accompany you to the Chief Scientist meeting as I will be in Chicago. I leave this morning in an hours time after what has been quite a busy week. I do hope that all goes well. Robin was at the Academy Council last week. He does think that there is a job for Fergus Ryan to do at "the big end of town" so you may get somewhere.

good luck,

John

lLyons to David Craig cc John White 14 October 2000 10.27 am

The latest move in the game to try to get the Intel-like policy adopted is to meet with Robin Batterham. The Chief Scientist has set aside the hour from 10am to 11am on Tuesday, October 24th, 2000 to meet me and companions not yet named. I should like very much to have your company on the visit, and also that of John White. If Professor Sue Sergeantson President

of FASTS, is suitably minded and available, I should like her present, but the biggest prize of all would be Brian Anderson.

Brian has expressed the opinion that there is no incompatibility between his recommendations on Batterham and a push to get Intel or its like to set up in Australia, but he pointed out that, when there are only $x available, then comparative judgments must be made. I agreed with him and indicated that the scheme for Intel or its like would not be a charge on the Federal Budget if inducements of tax concessions were the mechanism adopted. I have not heard from him since then despite numerous phone calls. He is very busy. I plan to arrive in Canberra on the preceding Monday, 23rd, so that we might meet during the afternoon or evening. I shall stay at University House if possible

Please come if you can, and to a meeting on Monday as well as to The Chief Scientist's office that I think is at 28 Allara St, Canberra, in the Department of Industry, Science and Resources

With good wishes,

Lawrie

To: Brian Anderson Cc: John White 18 September 2000 3.38pm

Starting IT Industry without Money

Dear Brian

Of course what you say in today's Email is correct.

Do you realise that starting a new IT industry needs no money? The proposal I have been trying to forward uses inducement that is financial, but it is offered to say Intel in the form of a tax rate for a company that, if we follow Ireland, could be set at 10%; or else, like Singapore could be set at zero for a period of years. In no way is money required from the appropriate year's budget. If indeed an inducement offer is not taken up, then the government tax does not increase. If the multinational (say, Intel) does not come to Australia, there is no tax payable to the Australian government. So the government has nothing to lose by making an offer of reduced tax.

Because Intel investment in 1998 was discussed at about the $6 billion level, to get such a company here would be one of the largest things ever to happen to Australian industry. As Bob Mansfield said, "It would make a huge difference to Australia".

For a long while, I have regarded you as a main player in the IT game. I do hope that you will be able to consider the matter afresh and maybe take up the running of the project. After all, it is your professional area.

With kind regards,

Lawrie

To: John White

Re: The Cause 7 May 1998 6.25am

At 12:20 PM 6/5/98 +1000, you wrote:

Dear Lawrie, Brian is away and he is certainly the best means of getting further action as he is a good friend of the Tech Academy president and they have already acted on the industry question copy of press release attached. I will keep in touch.

John

Dear John

It was kind of you to answer so promptly. Yes, the press release shows that Brian is interested in Australian industry.

The many hours of toil that goes into the efforts described in the press release could have been much better spent, however, on reinforcing the belief that a large change will come to Australian industry only by importing large manufacturing high technology plants from those who can supply them and who put up the capital – "THE CAUSE". All other effort is by the way. Repeat "ALL".

We need a dozen plants of $1 Billion or more, from as many multinationals. Then we shall be part of the "knowledge world". Why does no one understand this, John Moore (I think) and some others being excepted?

Your comment on Brian's attitude stopped short of saying "Your efforts are misdirected; you are flogging a dead horse; you should not let anything divert you from striving to get eg IBM here in strength (not like the small Wangaratta effort, now sold off.)"

Have you any idea of the thinking of ATSE's President on 'the cause'? Who is President and where does he come from? It is unlikely that any Australian high tech firm with its pitiful $1M of capital will support big newcomers, even though such a coming might well be the making of small

Australian firms with good ideas.

Letters like this to you will not come any more from me – I feel I have reached the end of a line.

May the Lord strengthen you in all your undertakings,

Sincerely,

Lawrie

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