

# AINSE

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An institute for research  
and training excellence  
in nuclear science

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## The First 50 Years

A history of the Australian Institute of Nuclear Science and Engineering

Brian H O'Connor, Allan R Chivas, Dennis W Mather,  
John D C Studdert, Anna E Binnie

2008

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## Foreword

This volume has its origins in May 2005 with the 50th anniversary of the Australian Institute of Nuclear Science and Engineering (AINSE) in 2008 looming, and with the imminent closure of the HIFAR research reactor rapidly approaching as HIFAR neared the end of almost 50 years as a servant of the Australian research community. The AINSE Executive Committee believed that this presented an opportunity for AINSE to reflect on its achievements during the HIFAR era and also to look ahead to the contribution that AINSE might play over the next 50 years which would become the OPAL era.

The history describes a unique and enduring research partnership between ANSTO (formerly the AAEC) and Australian universities. While there is much strategising today about the means of harnessing the efforts of individual scientists to work together for the national and international good, the vision to establish AINSE as a cooperative research institute was formulated by the AINSE founding fathers 50 years ago. A group of six senior scientists from the then AAEC and the universities came together to propose the formation of this unique national research organisation and to establish the framework under which it would operate. While the organisation has evolved considerably over the years, their remarkable vision continues to drive AINSE forward today.

This AINSE history tells an often breathtaking story of the science facilitated by AINSE whereby university staff and students seek competitive research awards which provide ANSTO facility access, travel and accommodation support such that there is equity of access regardless of the location of their university. From the outset, the geographic spread of grant recipients has demonstrated the truly national character of the organisation. Also, from the very first set of research awards it was clear that the scope of the supported research would extend beyond the use of HIFAR neutrons. The record shows the rich diversity of the science which AINSE has funded over the years, ranging from fundamental physics and chemistry to condensed matter science, materials engineering, archaeology, environmental science, biomedical science, and the Earth sciences.

Perhaps AINSE's most telling contribution for the nation has been the generations of students who have made use of nuclear science facilities through AINSE in their PhD, master, and bachelor honours research projects, with many progressing to become leaders in their chosen field and some becoming nuclear science experts.

The initial draft of the history was developed by science historian Dr Anna Binnie who was engaged to analyse the archives of the organisation and to summarise the key developments and challenges faced by AINSE in its initial years, from the perspective of the Council and Executive records. Anna's business-focussed account was then expanded and enriched by many members of the AINSE community, through additional research, interviews, the writing of recollections, and sourcing historical material.

Emeritus Professor Brian O'Connor

AINSE Past President

December 2008

Professor Allan Chivas

AINSE President

December 2008

## Acknowledgements

This work is a compilation of the efforts of a very large number of people, not least of whom are the researchers and the movers and shakers, past and present, who have helped to make AINSE what it is today.

We would like to thank every one of the many people who have offered opinion and advice in the preparation of this document, including the many librarians and archivists in universities and at ANSTO, who have assisted with the construction of selected entries in Appendix 11 and the assembly of many of the photographs.

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Bill Palmer

Robert Robinson

David Sangster

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## 1 Introduction – an institute for championing nuclear scientific excellence

On the 30 September 1961 a paper entitled 'Scattering of long wavelength neutrons by irradiated beryllium oxide'<sup>1</sup> appeared in the prestigious journal *Nature*. The authors of this paper were three employees of the Australian Atomic Energy Commission (AAEC), Terry Sabine, Arthur Pryor and Brian Hickman. The work appeared less than a decade after the Commission had been established and a mere three years after HIFAR (High Flux Australian Reactor), the reactor that produced the neutrons, was commissioned. The three authors together with Terry Walker would share, in 1964, the prestigious David Syme prize<sup>2</sup> for research on beryllium oxide using the relatively new technique of neutron diffraction. Two weeks later, on 14 October 1961, another paper appeared in *Nature* entitled 'X-ray and neutron diffraction examination of p-diphenylbenzene'<sup>3</sup>. The authors of this paper were Charles Birkett-Clews, Ted Maslen, and his student Hugo Rietveld from the University of Western Australia and Terry Sabine from the AAEC.

The question begs to be asked how did the university researchers using a relatively new technique gain access to the specialised nuclear reactor facilities owned by the AAEC located at Lucas Heights in outer Sydney; an access which resulted in the publication of significant papers in quick succession in such a prestigious journal?

This question is easily answered: university academics gained access to Australia's nuclear reactor and were allocated funds in support of their research through a newly established body, the Australian Institute of Nuclear Science and Engineering (AINSE).

In 1955, Australia had purchased a state-of-the-art research reactor, HIFAR. By the end of 1957 it had been constructed. It went critical in 1958 and by 1960 it was working at full power producing neutrons for researchers.

At this time the Menzies Government had implemented a major review of Australian universities. The committee's report, known now as the 'Murray Report' would provide solid backing for the notion of cooperative effort between the university sector and research establishments.

Terry Sabine had been recruited by the AAEC in 1956 and was sent to the UK Atomic Energy Research Establishment at Harwell (UKAERE) to develop expertise in the new neutron diffraction techniques. He returned to Australia in 1958 and immediately started to establish his research group within the AAEC. At this time the Commission was interested in the properties of beryllium oxide especially for use as a moderator in future power reactors.

Terry Sabine, together with other researchers at the AAEC who were sent to Harwell, such as Keith Alder, Jack Gregory, Grant Miles, John Parry, and David Sangster, would become part of the AINSE/AAEC inter-relationship. While Terry Sabine was perfecting his neutron diffraction skills, others were developing areas of importance to researchers at the AAEC and in Australian universities, for example radiation chemistry and radiochemical-isotope production<sup>4</sup>.



*AINSE has a home. The 1960 opening of the AINSE building. From left, Philip Baxter, Senator The Honourable W H Spooner, Minister for National Development, Cliff Dalton, Director AAEC Research Laboratories, Lucas Heights and Jack Somerville, second AINSE President.*

*This image personifies AINSE, in that it contains a representative each from the Government, the university sector, the AAEC and AINSE itself.*

1 Sabine T, Pryor A and Hickman B S. Scattering of long wavelength neutrons by irradiated beryllium oxide. *Nature* **191** 1385 – 1386 1961

2 The David Syme Prize is administered by the University of Melbourne and is awarded for the best original research work in biology, natural philosophy (physics), chemistry or geology during the preceding two years.

3 Clews C J B, Maslen E N, Rietveld H M, Sabine T M. X-ray and neutron diffraction examination of p-diphenylbenzene. *Nature* **192** 154-155 1961

4 Jack Gregory and Grant Miles would in time become senior officers of the AAEC Research Establishment. In 2007 the Polymer Division of the Royal Australian Chemical Institute would rename its Australian Polymer Science & Technology Achievement Award as the David Sangster Polymer Science and Technology Achievement Award in honour of David Sangster, 'an elder statesman of the Australasian polymer science community who has made exemplary contributions to the field of polymer radiation chemistry and emulsion polymerisation and has nurtured many generations of research students at the University of Sydney'. He was also awarded the AINSE Gold Medal in 1991.

## 2 Establishment - AINSE and the Cold War

In the 50s, at a government level, there was a keen interest in adding nuclear weapons to Australia's defence and civil capabilities. Australia's interest was developed, to some extent, within the parameters of the United Nations 'Atoms for Peace' UNESCO program. Dr Don Stranks, who had returned from the University of Leeds to the University of Melbourne in the late 50s, was part of this program. This program showed to the world the wide applications of nuclear energy.

At the conclusion of the Second World War, Australia as a nation was coming to terms with a number of factors which on the surface may appear to be unrelated. Australia, before the war, had been predominantly a primary producer. Australia's manufacturing industry was embryonic at best and its population of 7.7 million was mostly concentrated in a handful of coastal cities.

Australia is a vast continental island with a long coastline and experience during the recently concluded war had revealed that it was almost impossible to defend with its small military forces. After World War II Australia's Prime Minister, Ben Chifley, was determined that Australia would never again be dependent on others for its defence. As a consequence of this he was determined to develop a manufacturing industry:

- to develop the dead heart of the nation through irrigation schemes;
- to increase Australia's population through immigration;
- to provide tertiary education for this anticipated increased population; and
- to embrace the latest power producing technology, atomic energy, now more correctly termed nuclear power.

Many of Chifley's initiatives, such as the Snowy Mountains Scheme, the formation of the Australian National University, and the assisted immigration schemes were supported by the next Prime Minister, Robert Menzies, and many of these projects were completed during Menzies' years in office.

The international political scene that both Prime Ministers inherited was one of the Cold War. Nuclear energy had another face related to the most destructive weapons then known. These weapons were as much a threat to the future of life on Earth in the early 50s as they are now. Consequently in these early years of the emerging nuclear industry, access to nuclear technology was limited by military security and, as such, was not readily shared even amongst allies. At this time, the Australian Government was considering nuclear options for both defence and civil purposes. Unfortunately, this meant that any organisation that was established to develop nuclear power required a security screening of its personnel. This raised questions about university personnel who otherwise did not require a security screening.

The Australian Atomic Energy Commission was established under the general defence powers of the Commonwealth in April 1953 when the Commonwealth Parliament passed the Atomic Energy Act (1953). This bill was passed with endorsements from both the Government and the Opposition parties.

### 2.1 Atomic energy for Australia?

The AAEC was established for the express purpose of developing atomic energy for the production of power in Australia and for defence purposes. One outcome was the training of scientists and engineers in aspects of nuclear science and its peaceful applications, to

*arrange for the training of scientific research workers and the establishment and award of scientific research studentships and fellowships in matters associated with uranium or atomic energy ... to make grants in aid of research into matters of uranium and atomic energy ... to make arrangements with universities and other institutions or persons for the conduct of research into matters associated with uranium and atomic energy<sup>5</sup>.*

To undertake this training role, the AAEC rapidly established studentships and fellowships to train scientists, many of whom would ultimately be employed by the Commission itself.

Neutron diffraction techniques had been demonstrated in the 30s. In March 1936, Les

### The AINSE 'Schools'

Hugo Rietveld was part of an AINSE 'school' of researchers who interacted with, and contributed to, the Institute. Such schools are an important element of AINSE interactions over the decades whereby AINSE-sponsored researchers supervise students, and these in turn become supervisors in their own right.

Ted Maslen was Hugo Rietveld's doctoral supervisor early in his time in the Physics Department at the University of Western Australia. Ted had returned from Oxford (where he held a Rhodes) with a D Phil gained under the supervision of Dorothy Hodgkin, Nobel laureate. He established a substantial crystallography group at UWA and supervised many crystallography PhDs. These included, at the same time as Hugo Rietveld, Professor Brian O'Connor and Professor Syd Hall. Brian was the recipient of 19 AINSE research awards from 1990 to 2003, supervised two AINSE postgraduate scholars, was a Member of the AINSE Council from 1989 and was President in 2007. Other eminent crystallographers from this group include Dr Jose Varghese and Professor Mark Spackman.

Ted Maslen's contribution to neutron diffraction through AINSE was important in those early years. Ted received 28 AINSE awards primarily for crystal structure analysis by neutron diffraction from 1960 to 1990. This work was done in close collaboration with Frank Moore, leader of the AINSE Neutron Diffraction Group.

Brian O'Connor recalls that Professor Birkett-Clews was the 'stern' head of department who hired Maslen. Birkett-Clews was one of the recipients of the 1961 awards series for a project, 'Neutron diffraction studies on metals and on diphenyl compounds'.

This AINSE-sponsored stream of researchers is one of the many that can be traced from the earliest days through to the present. In this instance, Ted Maslen was working with Birkett-Clews, who later supervised the doctoral research of Mark Spackman. Later in his career Mark Spackman supervised the doctoral research of Andrew Whitten at the University of New England. Andrew, an AINSE PGRA scholar, is currently undertaking a postdoctoral fellowship at ANSTO's Bragg Institute with Professor Jill Trehwella.

<sup>5</sup> Atomic Energy Act, 1953

*Comptes rendus de l'Académie des sciences* published a paper by W M Elsasser 'The diffraction of slow neutrons by crystalline substances'<sup>6</sup>. This paper was followed by two other papers later that year, one in *Les Comptes rendus de l'Académie des sciences*: H Halban and P Preiswerk, 'Experimental proof of neutron diffraction'<sup>7</sup> and the other in *Physical Review* D Mitchell and P Powers paper, 'Bragg reflection of slow neutrons'<sup>8</sup>.

These earliest experiments used neutrons from radium-beryllium sources. However, the development of nuclear reactors, during and after the Second World War, provided a new and vastly superior source of neutrons for research and gave rise to quantitative experiments at the Oak Ridge National Laboratory in Tennessee USA (ORNL) by Ernest Wollan and Clifford Shull in the late 40s. In a parallel development, Bertram Brockhouse, working at Chalk River and McMaster University in Canada developed neutron spectroscopy from 1950 to 1962. The pioneering research of Shull and Brockhouse was recognised with the award of the 1994 Nobel Prize in Physics 'for the development of the neutron-scattering techniques for studies of condensed matter'. The notion of scientists leasing time on reactors for research also started to be canvassed, *the Science Research Council in the United Kingdom acquired partial use of reactors at the Atomic Energy establishments at Harwell and Aldermaston*<sup>9</sup>. It is through the use of neutron beams from nuclear reactors that neutron diffraction became one of the more powerful and versatile analytical techniques available for studies in materials science.

Shortly before the Atomic Energy Act was passed and the AAEC established, the young Canadian, Professor Harry Messel had been appointed as Head of the School of Physics at Australia's oldest university, the University of Sydney, in September 1952. The School of Physics at this time was still recovering from the deprivations of the Second World War and the previous Professor and Head of School, Ulrich Vonwiller, who had retired in 1945, had not been replaced.

Professor Harry Messel came to the position as a whirlwind. In August 1953 he gained the University of Sydney Senate's approval for the establishment of the Nuclear Research Foundation. The Foundation was the first of its type in the British Commonwealth and sought funds from commerce, industry and from wealthy individuals to finance research into nuclear physics at the University of Sydney.

By November 1953 Messel had raised £24,408 for this purpose and he wrote to both the Chair and Deputy Chair of the AAEC - Jack Stevens and Professor Philip Baxter, respectively - requesting funds and later seeking information concerning proposed AAEC studentships and fellowships<sup>10</sup>. Baxter informed Messel that there had been no progress on the studentships and Stevens referred Messel to the Scientific Advisory Committee of the AAEC<sup>11</sup>.

Professor Harry Messel sought two low-power research reactors for the University, one for research and the other for training. It is rumoured that he had actually intended to put both these reactors in the basement of the School of Physics at the University, a situation that was not uncommon in Europe and the USA at the time. A report of the Joint Committee of the Senate and the Nuclear Research Foundation, at the University, dated 28 July 1955, proposed a postgraduate course in nuclear science and engineering, and which supported the case for the two reactors. It also noted

*It is the opinion of this Committee that it may not be possible for the Atomic Energy Commission to provide the access and facilities for independent lines of research. It is concerned that access will be inadequate ... it is still concerned regarding continuity of policy under political control*<sup>12</sup>.

\* Photo of Sir Philip Baxter by Max Dupain courtesy of the University of New South Wales Archives: reference number UNSW Archives CN486/3/18

6 Elsasser W M. The diffraction of slow neutrons by crystalline substances. *Les Comptes rendus de l'Académie des sciences* **202** 1029 1936

7 Halban H and Preiswerk P. Experimental proof of neutron diffraction. *Les Comptes rendus de l'Académie des sciences* **203** 73 -75 1936

8 Mitchell D and Powers P. Bragg reflection of slow neutrons. *Physical Review* **50** 486 – 487 1936

9 Bacon G E (editor) *Fifty years of neutron diffraction*. Adam Hilger, Bristol (year of publication is not listed)

10 Letter from Messel to Stevens, Chair of AAEC, dated 19 November 1953, University of Sydney Archives, Agency G47 (School of Physics) Box 244

11 Correspondence 1953, University of Sydney Archives, Agency G47 (School of Physics) Box 244

12 University of Sydney Archives, Agency G47 (School of Physics) Box 244



## Sir Philip Baxter\* CMG FAA

The following extract from 'A Tribute to two Distinguished Scientists, Sir Philip Baxter and Sir Ernest Titterton', AINSE Activities 3 June 1990, pays tribute to this distinguished visionary who passed away in September 1989.

*Sir Philip Baxter's vision and energetic leadership, led to the building of the Research Establishment at Lucas Heights and to the major achievements of the Commission's research programs.*

*In 1957, Sir Philip, while Chairman of the AAEC and Vice-Chancellor of the University of New South Wales, initiated discussions with the representatives of the eight Australian universities then in existence. These discussions led to the establishment of AINSE. Sir Philip Baxter was confident that cooperation between the universities in sharing the facilities and research expertise at Lucas Heights, through AINSE, was an economic and valuable national asset.*

*As the AAEC representative on the AINSE Council from 1958-72, Sir Philip strongly supported AINSE's activities. His clear recognition of the Institute as an independent body was a major factor in establishing the climate of goodwill which has characterised the relationships between the Australian Nuclear Science and Technology Organisation (ANSTO) and AINSE up to the present time.*

*Continuing reminders of the many contributions to Australian society made [by this] outstanding man will be seen in the activities of the organisations which grew from [his] farsighted initiatives.*

Bill Palmer, AINSE's first Scientific Secretary, said

*Sir Philip's vision and action provided universities with access to HIFAR and other Lucas Heights facilities through AINSE, and thus avoided the problems of installing and operating their own small reactors with very limited value for research use*

Under the terms of the Atomic Energy Act 1953, the only organisation that could operate nuclear reactors in Australia was the AAEC. This meant that any reactors that Harry Messel may have procured would have had to be operated by the Commission. This was the period of the Cold War and all new recruits to the AAEC were vetted by the Australian Security Intelligence Organisation (ASIO). It is noted that all public servants, including scientists working in the Commonwealth Scientific and Industrial Research Organisation (CSIRO), were also vetted at the time by ASIO, but that academics were not subject to this requirement. Consequently a fear seemed to exist within the academic community that access to any facilities that the AAEC would eventually have, would not be made freely accessible to university researchers. Furthermore, there was also alarm that only politically acceptable projects might be allowed.

Meanwhile, in 1954 Australia had bought a new DIDO class reactor from the (United Kingdom Atomic Energy Authority) (UKAEA) off the plan. It was almost a direct copy of the Harwell reactor and became known as HIFAR, Australia's first research reactor. Since this was a new type of reactor, there were the inevitable delays in construction. Messel had, by mid 1955, decided to obtain his own reactors and was even prepared to have them located at the AAEC Research Establishment at Lucas Heights.

## 2.2 AINSE is proposed

Jack Stevens, the first Chairman of the AAEC, had established a joint University and AAEC Committee<sup>13</sup> to investigate how universities would access AAEC facilities. In 1955 universities were ... *invited to state what facilities they expected to require for research and teaching, and the numbers of research workers and students for which the facilities would be required*<sup>14</sup>.

Philip Baxter initiated a series of informal meetings between AAEC representatives and representatives appointed by the prospective member universities in 1957 and 1958 to explore the possibility of creating the body which was to become AINSE.

Initially there was no great urgency but by 1957, when HIFAR was nearing completion, it appeared that the universities would soon be clamouring for access to HIFAR and other facilities located at Lucas Heights. This Universities/Atomic Energy Commission Committee supported a proposal to form an independent body that would facilitate the utilisation of AAEC facilities by university researchers and their students. The AAEC, in early 1957, developed a submission to Cabinet concerning the training of scientists and engineers in nuclear science and engineering. The Cabinet submission documents stated

*... it is desirable that Australia's research effort should be as broadly based as possible ... it is not desirable that all atomic energy research in Australia should be confined within official agencies. Scientists within universities, and advanced postgraduate university students, should be drawn upon, and are moreover anxious to be given opportunities of participation.*

*... formal training of atomic energy scientists is, and should remain, the function of the Universities ... it is impossible for Universities to provide from their own resources the highly specialised and costly facilities which will be available in Australia only at Lucas Heights Research Establishment, and it would be undesirable for them to attempt such duplication. Arrangements are therefore necessary under which all the Universities, under appropriate conditions, should have access to these facilities for the training of their postgraduate students*<sup>15</sup>.

This submission then summarised some of the methods by which universities overseas gained access to reactor facilities:

- in the USA, the solution was for each United States Atomic Energy Commission (USAEC) facility to have linked to it a group of universities;
- in the UK, there was a plan for a joint organisation between universities and the UKAERE at Harwell for training and access to the reactors for university researchers; and
- in Canada, Chalk River was available for university-based researchers.

<sup>13</sup> There are several references to the existence of this committee but details of its composition, actual formation date and functions have not been found.

<sup>14</sup> AAEC Annual Report 1955, p44

<sup>15</sup> Cabinet meeting 14 May 1957, Agendum 573



Photo © The Science Foundation for Physics

## Emeritus Professor Harry Messel AC

The arrival of Professor Harry Messel for meetings of the AAEC Commission meetings at the AAEC Head Office in Coogee always resulted in a frisson of excitement amongst awaiting staff. The entry of this urbane, always determined and focused Figure clutching a large cigar usually heralded an animated meeting of AAEC's governing body.

Messel's participation in AINSE meetings was equally energetic although he only served as an AINSE Councillor for the University of Sydney for four years from 1958 to 1961. He had been Professor and Head of the School of Physics for six years and was still only 36!

The preparation of this history has brought back a 'flood of memories' and it prompted him to recall his own role in the foundation of the Institute. In his own words:

*The Nuclear Research Foundation played an important role in alerting the Australian public to the importance of atomic energy and the possible role it could play in the future. The British atomic weapons tests in Australia, however, did much to turn many Australians off atomic energy - even for peaceful purposes. Certainly, the Foundation was not the flavour of the month at the time, with the government and its advisors, but its powerful group of leading businessmen ensured it was heard and that Australia became involved in some aspects of the peaceful uses of atomic energy. The Foundation flew out the Harwell isotope team to the University of Sydney School of Physics in the mid 50s which resulted in St Vincent's Hospital in Sydney establishing a nuclear medicine department. Importantly, the Foundation was the honest broker in the establishment of AINSE as was formally recognised in 1957 Murray Commission Report on Australian universities.*

In 1953 the University Senate approved the Constitution of the Nuclear Research Foundation - the first in the Commonwealth.



In Australia the Universities/Atomic Energy Commission Committee suggested a different type of structure and the AAEC formally recommended the

*... establishment of an 'Australian Institute of Nuclear Science and Engineering' to be governed by a council representing all the universities and the Commission itself. The objects of the Institute would be to assist University research and training in the atomic energy field, and to regulate the use of the facilities at Lucas Heights which should be made available to the Universities<sup>16</sup>.*

The details on how the new Institute would be organised and managed were also set out in the submission.

*The Institute would have a small permanent secretariat financed by contributions from all parties ... and would have its headquarters at Lucas Heights. The permanent staff might perhaps be members of the Commission's staff seconded for the purpose.*

*The Institute would have a council appointed by the member organisations, which would, through the secretariat, and in association with the Commission, organise research fellowships and training courses for University personnel and students at Lucas Heights<sup>16</sup>.*

The submission then discussed the conditions under which the new Institute would operate. These included the safety conditions of reactor work and very importantly, for academic freedom of enquiry, the *conditions for University work would be established to permit the maximum degree of freedom of University research workers, and no security provisions would be required, as any security areas in the Commission's establishment would be excluded from the arrangement<sup>16</sup>.*

The initial fears that some University researchers may be excluded from the atomic energy research facilities were now mollified.

Operating costs for the new Institute were estimated at £20,000 pa and the contributions from the inaugural members were determined<sup>17</sup> (Table 1).

**Table 1. Inaugural Members/Contributors and Membership Fees in 1958**

<b>Member or Contributor</b>	<b>Membership Fee (£)</b>
The University of Sydney	2,000
The University of Melbourne	2,000
NSW University of Technology (now UNSW)	2,000
The University of Adelaide	1,000
The University of Queensland	1,000
The University of Western Australia	500
University of Tasmania	500
The Australian National University	2,000
University of New England	500
Australian Atomic Energy Commission	11,000

The submission for the establishment of AINSE had not included the Australian National University nor the University of New England. However, in early 1957 the Australian National University decided to engage in fundamental nuclear physics research and by the time AINSE had its inaugural meeting on 4 December 1958, both universities had become members of AINSE.

AINSE was established by a Cabinet decision on 14 May 1957, which simply stated that Cabinet agreed

*... to the establishment of a joint organisation between the Australian universities and the [Australian] Atomic Energy Commission, for furthering the training of scientific and technical personnel in atomic energy work, and to be known as the 'Australian Institute of Nuclear Science and Engineering';*

<sup>16</sup> National Archives of Australia, Series A5619/1 item C375 'AAEC Research and Training', part of Cabinet Submission 573

<sup>17</sup> Cabinet Meeting 14 May 1957, Agendum 573

*to the working out between the Commission and the participating Universities of the constitution for the Institution ...*

*to the construction at Lucas Heights of a building to be the headquarters of the Institute at a total cost of £60,000.*

*... the Nuclear Research Foundation of the University of Sydney has hopes of being offered by the Ford Foundation of the U.S.A., free of cost, and installed in Australia, a research reactor worth about £2,000,000 Australian<sup>18</sup>.*

At the same time Messel had approached the Federal Government for a possible additional reactor

*... The Nuclear Research Foundation has suggested that the reactor ... should be used on a national basis, i.e., that it should be available to all the Australian universities, the Commission and to industry ...that it should be installed at the Lucas Heights research establishment ... where the Commission could be the operating authority... the crux of the matter is that neither the Nuclear Research Foundation nor the University of Sydney has any hope of raising the funds for the operation of the reactor ... The Government of New South Wales has declined to consider the proposal we understand<sup>19</sup>.*

Harry Messel may have been able to get access to an additional research reactor free of charge but the costs for running it were beyond the University of Sydney. Consequently, the Commonwealth Government had been approached to help provide the necessary funds to operate an additional reactor.

After the Cabinet decision to establish AINSE, the Cabinet decided to accept any research reactor that Messel might be able to get but the Commonwealth Government was reluctant to give unconditional support for the maintenance and ongoing operating costs for this additional reactor. The issue of Messel's reactor was discussed at this meeting and Cabinet agreed

*... to the Minister for National Development being authorised to discuss further with appropriate authorities proposals whereby the Ford Foundation would make available in Australia a nuclear reactor for University use ... the reactor would be located at Lucas Heights and that effective control over its installation and operation would be exercised by the Australian Atomic Energy Commission. The Minister is authorised to indicate that the Commonwealth is willing to provide running costs ... up to £100,000 per annum on a 1 pound for 1 pound basis with the Universities and the Nuclear Research Foundation<sup>20</sup>.*

After the cabinet meeting, Baxter sent a cablegram to J Kirby (Chair of the Nuclear Science Foundation) who was then in Japan. In the cablegram<sup>21</sup> Baxter states

*... am advised that your reactor proposals were discussed by Cabinet today along with Commission's recommendations for establishment of Australian Institute of Nuclear Science and Engineering. Cabinet decided steps should be taken to establish an Institute as a means of promoting close co-operation between Universities and Commission and agreed that if you could get a reactor of a suitable type it could make valuable contribution to facilities for joint activity in this field but felt Universities and Industry should give support<sup>22</sup>.*

Messel did not get the Ford Foundation reactor. He also could not raise the funds to operate the reactor and consequently the gift was never conferred on the university. The only nuclear reactors in Australia would be under the charge of the AAEC, later the Australian Nuclear Science and Technology Organisation (ANSTO).

During this period the Australian universities were being reviewed by the Martin Committee, a high-level committee which had been appointed by the Prime Minister in December 1956 and chaired by Sir Leslie Martin. The terms of reference and recommendations of the committee provided a positive political environment for the nurturing of an entity such as AINSE.

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18 ibid

19 ibid

20 ibid

21 14 May 1957

22 A1209/23 1957/4127 Training/Ford Foundation

The Committee was invited to

*... indicate ways in which the universities might be organized so as to ensure that their long-term pattern of development is in the best interests of the nation, and in particular to inquire into such matters as -*

*the role of the university in the Australian community*

*the extension and co-ordination of university facilities*

*technological education at university level*

*the financial needs of universities and appropriate means of providing these needs.*

The Committee advised that it *devoted particular attention ... to ensure that ... existing resources are used adequately and needless duplication does not occur.*<sup>23</sup>

In its review, the Committee accepted that science and technological education presented *special problems* that needed to be addressed. The Committee accepted that in this area there needed to be collaboration and sharing of resources.

*It is obvious ... that the experimental requirements for training and research in ... scientific or technological fields such as radio astronomy and nuclear engineering are such that they are beyond the financial resources of any individual university, though facilities may be available in Government agencies such as the CSIRO and the Australian Atomic Energy Commission. It may well be that the universities will have to depend increasingly on their own co-operative efforts to secure major and very costly items of equipment for use at one or another of them, or on ad hoc arrangements with appropriate Government bodies for access to such equipment.*

*The initiative of the Australian Atomic Energy Commission in successfully promoting the establishment, in association with all State universities, of the Australian Institute of Nuclear Science and Engineering is greatly to be commended, as is the major part taken in this project by the Nuclear Research Foundation within the University of Sydney.*

## 2.3 The AINSE constitution

Thus AINSE became an entity on paper but it had no powers, no constitution and no *modus operandi*. The first matter to be addressed was the creation of a constitution for this new body and a description of how it would operate.

Shortly after AINSE was established, legal advice was sought in regard to the writing of its constitution. AINSE was unique, being an organisation made up of universities and the AAEC, a Commonwealth Government entity. This raised issues of State – Commonwealth relationships. In 1957 the NSW Crown Solicitor's Office was first approached to write the constitution, in a memorandum from the Acting Crown Solicitor (NSW) to Solicitor-General (Commonwealth):

*The Deputy Crown Solicitor, Sydney, has been instructed by the Australian Atomic Energy Commission to draft a constitution for an organisation to be known as the Australian Institute of Nuclear Science and Engineering*<sup>24</sup>.

In a note<sup>25</sup> from the Acting Deputy Crown Solicitor Sydney to the Acting Crown Solicitor (NSW), recognition of the first legal hurdle is made, that of where the Institute should be incorporated:

*Similar Institutes to that now proposed have been established in other countries and I enclose a copy of the Charter of Incorporation and By-Laws of the Oak Ridge Institute of Nuclear Studies. As the United Kingdom and Canadian Institutes have only recently been established I have been unable to obtain copies of their respective constitutions ... Having regard to the functions of the proposed Institute and the financial commitments of the Commonwealth in connection therewith plus the obvious difficulties and disadvantages of registration under the Companies Act 1936 of NSW it appears to me desirable that the Institute should be incorporated by Commonwealth legislation*



Photo courtesy the University of Adelaide Archives:  
Series 695

### Professor Denis Jordan AO

Denis Jordan was AINSE's inaugural and third president (from 1958-59 and 1961-62) and he is the only person to have had two terms as President. He served on the AINSE Council from 1958 to 1970 and from 1973 to 1976.

Denis Jordan was appointed to the chair of the University of Adelaide's Physical and Inorganic Chemistry Department in 1954 and then Dean of the university's Faculty of Science in 1958 – the same year he became the first AINSE President. He was appointed university Pro Vice-Chancellor in 1974-75 and retired as Professor Emeritus in 1979.

*In his opening remarks [as President], Professor Jordan stated that he was both surprised and flattered to receive the honour bestowed upon him by his election as the first President of the Institute. He felt this particularly as he was one of the few chemists represented on the Council.*

From 1963 to 1968 he conducted an active research program which investigated the effects of radiation on biological and polymer materials. In 1980 the University of Adelaide named its Physical and Inorganic School in his honour.

His strong and diplomatic leadership encouraged a cooperative relationship between the AAEC and the nine university members of AINSE.

His support of research in radiation chemistry and radiation biology led to the biennial AINSE conferences in this area.

<sup>23</sup> Report of the Committee on Australian universities, September 1957 p5

<sup>24</sup> A432 Item 1957/419 Australian Institute of Nuclear Science and Engineering – Constitution

<sup>25</sup> 10 October 1957

*and the matter is accordingly referred for your consideration*<sup>26</sup>.

The Acting Crown Solicitor (NSW) subsequently wrote to the Solicitor General (Commonwealth) requesting clarification as to whether AINSE should be established under Commonwealth or State Law<sup>27</sup>. The Acting Crown Solicitor suggested that AINSE be set up under State Law<sup>26</sup>. While the legal entities were discussing whether AINSE should be incorporated under State law or Commonwealth Law, the new Chair of the Commission, Philip Baxter was growing impatient. In December he wrote a letter<sup>28</sup> to K. Bailey, Solicitor General (Commonwealth) saying,

*I would be grateful if you would assist the Commission in bringing the drafting of the constitution to an early conclusion*<sup>26</sup>.

A solution to the legal impasse was eventually resolved. AINSE would not be incorporated at all and in a note to the Deputy Crown Solicitor<sup>29</sup>, the Crown Solicitor suggested that the Commission pass a motion in essence saying that AINSE fulfils part of the training aspect of the Atomic Energy Act, 1953.

*It does not appear to be essential that the Institute should be incorporated provided that the Commission can exercise its own powers on behalf of the Institute on such matters as the handling of funds, procurement of accommodation, equipment and materials and control of facilities*<sup>26</sup>.

In January in a note<sup>30</sup> to the Crown Solicitor, the Acting Crown Solicitor stated

In these rules I have provided that all property of the Institute shall be vested in the Commission as trustee (Rule 3) and that the Commission will handle the funds of the Institute (Rule 48 *et seq*) ...

*Although the rules provide that the Council of the Institute shall have sole control in regard to all matters relating to the management and organisation of the Institute I consider that, the Commission would exercise its own powers on behalf of the Institute*<sup>26</sup>.

The Constitution of AINSE had been drafted and the Commission followed the legal advice and passed the motion requested by the legal teams.

Years later, in 1976, the first Executive Officer of AINSE, Bill Palmer<sup>31</sup> related to the AINSE Council the actions that the Commission took

*... the following decision of the Australian Atomic Energy Commission at its 38<sup>th</sup> Meeting on 18 February, 1958 ... The Commission approved the draft Constitution and authorised the Chairman to agree to any amendments, and adopt the following resolution:- It being in the opinion of the Commission, essential for the purpose of ensuring the provision of uranium and atomic energy for the defence of the Commonwealth so to do, it is AGREED that the Commission make arrangements with the Australian universities for the formation of an organisation to be known as the Australian Institute of Nuclear Science and Engineering with the functions of*

- a) *Conducting research into matters associated with uranium and atomic energy*
- b) *Training scientific research workers*
- c) *Establishing and awarding scientific research studentships and fellowships in matters associated with uranium or atomic energy*<sup>32</sup>.

*\*Photo of Sir Ernest Titterton courtesy of Australian Academy of Science*

26 A432 Item 1957/419 Australian Institute of Nuclear Science and Engineering – Constitution

27 22 November 1957

28 5 December 1957

29 20 December 1957

30 8 January 1958

31 Bill Palmer was the first Scientific Secretary of AINSE; he commenced in November 1959

32 Paper entitled 'Review of AINSE Activities' in Minutes of C2/76



## **P**rofessor Sir Ernest Titterton\* FAA

The long and distinguished career of Sir Ernest Titterton is well documented in numerous sources. In his comprehensive biographical memoir prepared for the Australian Academy of Science J O Newton FAA states

*With the death of Sir Ernest Titterton on 9 February 1990, Australia has lost one of its most controversial scientists. Well known because of his forthright and uncompromising views on the subjects of nuclear weapons and nuclear power and because he 'pushed the button' for the world's first nuclear weapon, he was highly regarded by some and hated by others.*

At the time of his attendance at the inaugural meeting of AINSE as a Councillor in December 1958, Titterton was Head of the Department of Nuclear Physics at the Australian National University (ANU) a position he held from 1950-1970. In 1954 Titterton was elected as one of the earliest Fellows of the Australian Academy of Science. His distinguished career to date had allowed him to develop solid contacts with the Menzies Government – a benefit for the emerging AINSE. His extensive contacts with world figures in the nuclear field led to many of them visiting Australia under AINSE auspices, particularly to contribute to AINSE Nuclear Physics Conferences in the early 60s.

Sir Ernest Titterton served as AINSE Councillor from 1958 to 1984. He was President in 1973 and 1974. At the time of his appointment as President, he had concluded a term as Director of the Research School of Physical Sciences (RSPHysS) at the ANU and had returned to the Department of Nuclear Physics as Director.

He retired at the end of 1981 and continued as a Visiting Fellow in the Department of Nuclear Physics until his death in 1990.

AINSE's debt to his long contribution to the Institute is reflected in a decision to provide financial support for the cataloguing of his papers following his death – the first and only occasion that funds had been allocated for such a purpose.



## 2.4 The inaugural meeting of the AINSE Council

The inaugural meeting of the Council of the Australian Institute of Nuclear Science and Engineering was convened at 11.15 am on 4 December 1958 at the palatial beachside AAEC Head Office at Coogee.



Cliffbrook. AAEC Head Office at Coogee until 1982. Photograph courtesy of ANSTO

Present at this inaugural meeting were representatives appointed by the member universities: Professor Harry Messel from the University of Sydney; Professor Denis Jordan from the University of Adelaide; Professor Ernest Titterton from the Australian National University; Professor Hugh Webster from the University of Queensland; Professor David Allen-Williams from the University of Western Australia; Professor Leslie Woods from the University of New South Wales; Dr Geoff Cheesman from the University of Tasmania; Dr Robert Smith from the University of New England; and four representatives from the AAEC, being Professor Philip Baxter (Chairman, AAEC), Professor Sir Leslie Martin (Commissioner AAEC as well as representing the University of Melbourne), Mr Allan McKnight (Commissioner, AAEC) and Mr Charles Watson-Munro (Chief Scientist, AAEC). Those present were deemed as 'Councillors'.

*Professor Baxter welcomed all Councillors and suggested that the first business of the meeting should be to give life to the Institute by formal adoption of the draft Constitution and Rules; a President and two Vice Presidents should then be elected in accordance with Rule 17.*

Following these words, uttered by Philip Baxter, then Chairman of the AAEC, at the inaugural AINSE Council Meeting, AINSE came into being upon formal adoption of the Constitution of the Australian Institute of Nuclear Science and Engineering.

Philip Baxter, notwithstanding his pivotal role in the establishment of, and support for, the Institute, never assumed a role above that of Councillor, a position he was to hold from 1958 to 1972. The reason for this is perhaps explained in the Minutes of this Inaugural meeting whereby Baxter expressed the Commission's view

*that neither a member nor officer of the Commission should occupy the office of President at this stage; ... and felt that the Institute's President should be elected from one of the Universities outside both the Sydney and Melbourne urban areas.*

Even though Leslie Martin and Philip Baxter were representatives of the AAEC they also held professorial positions, in Physics at the University of Melbourne and in Chemical Engineering at the University of New South Wales, respectively.

At its outset, AINSE membership included all Australian universities, a situation that would



Photo P9504 courtesy of Heritage Centre, University of New England

### Professor Jack Somerville

Jack Somerville was AINSE's second president in 1960 and he served as Councillor from 1958 to 1964. Shortly after he resigned as Councillor he passed away in October 1964. He was remembered by the Council where all present at the December 1964 meeting stood and observed a brief silence. His contributions, particularly to physics, are recorded in the Minutes of the November 1964 Executive Committee meeting.

[Throughout his period of involvement with AINSE] Professor Somerville gave his time, thought and effort to the Institute's affairs, and gained the affection and respect of all who were associated with him; his balanced judgement, far-sightedness, and fine sense of humour contributed greatly to the Institute's activities. As foundation Professor of Physics in the University of New England, Professor Somerville had established a School of Physics of high reputation both for teaching and research, and he had become recognised as a leading scientist in the fields of electrical discharge phenomena and plasma physics. The Institute would remain grateful for the sound foundations he had been instrumental in establishing ...'

Jack Somerville's guidance of AINSE activities in the formative years was of great value in establishing a good relationship between the AAEC and the universities.

In 1934 he gained a BSc from the University of Sydney, followed by a BA from Cambridge University in 1936. He returned to Australia as a research assistant in physics at the University of Sydney in 1937, and then was appointed senior lecturer in mathematics and physics. In 1941 he became assistant director of the radiophysics training school, a position he kept until 1945. He was Foundation Professor of Physics at the University of New England from 1953 to 1964. In 1953 he was awarded a DSc by the University of Sydney.

essentially continue in the same way for the next 50 years as the number of universities increased.

These initial representatives were senior members of their respective organisations and remained on AINSE Council for considerable periods of time. The inaugural Councillors served as follows:

Professor David Allen-Williams	26 years
Professor Ernest Titterton	26 years
Professor Charles Watson-Munro	20 years
Professor Denis Jordan	17 years
Sir Philip Baxter	15 years
Professor Geoff Cheesman	14 years
Sir Leslie Martin	11 years
Professor Hugh Webster	10 years
Allan McKnight	3 years
Professor Harry Messel	2 years
Dr Robert Smith	2 years
Professor Leslie Woods	1 year.

Some of the foundation member universities have had very few changes in their Council representation: the University of Adelaide has had five Councillors, the Australian National University six, the University of Tasmania five, and the University of Western Australia four to the end of 2007.

Similarly, the organisation has only had three scientific secretaries. This long-term engagement of Councillors and administrators has resulted in a consistency of governance and practice, particularly in relation to the allocation of research grants, scholarships and fellowships.

The inaugural meeting was a gathering of university and AAEC representatives of very high standing. The Councillors had sufficient status within their respective universities to be able to commit funds without reference back to their institution. This senior-level representation on the AINSE Council ensured that AINSE was able to function at the highest possible level. High-level representation continues today and is one of the strengths of the Institute.

Then Minister for National Development, The Honourable Senator Spooner, had been invited to open proceedings. In his speech delivered to the meeting, Senator Spooner took the opportunity to announce that the government would be providing £60,000

*... for a headquarters building at Lucas Heights ... includes lecture hall, study rooms, and offices, and is to be ready for occupation by the middle of next year.<sup>33</sup>*

The construction of the building took a little longer than expected and was finally occupied on 21 March 1960 and was officially opened on 27 May 1960 by Senator Spooner<sup>34</sup>. This building, with a few alterations and refurbishments, is the building that AINSE currently occupies at Lucas Heights.

The first task of Council, after the opening formalities, was to elect the President, other Office Bearers and the adoption of the Constitution and Rules of the organisation. Professor Denis Jordan, from the University of Adelaide, was elected President. The Constitution and Rules were adopted and now the organisation had appropriate legal status. The Constitution of AINSE remained unchanged until 1990.

The Council was soon seen as too large a body to run all the activities of the new Institute, and therefore resolved that a smaller executive group would be able to meet with the requisite frequency, with the day-to-day running of the organisation to be the responsibility of an executive officer. To achieve both ends, Philip Baxter, from the AAEC, suggested that an Executive Committee be established and that the Executive Committee be responsible for employing an Executive Officer. The Council accepted this motion and the first Executive Committee comprised Denis Jordan (President), Charles Watson-Munro and Allan McKnight from the AAEC.

<sup>33</sup> A987 (A987/4) E1223 AINSE

<sup>34</sup> Report of Proceedings from Inauguration on 4 December 1958 to December 1960

# Official Opening

At Lucas Heights on May 27th, the Minister for National Development, Senator Spooner, opened new buildings which cost £220,000 to build.

The buildings comprised the Isotopes/Technical Physics block, the headquarters of the Australian Institute of Nuclear Science and Engineering, and the canteen.

The Isotopes/Technical Physics building, in which Health Physics also has a place, called for special considerations in the various types of laboratories, with need of fine tolerances and exacting design.

The Institute building is now the home of an organisation comprising all Australian universities and the Atomic Energy Commission.

It is devoted towards furthering fundamental research and training with access to the facilities at Lucas Heights.

The laboratories, some of them pictured here, will be the home of some of the men whom the Minister described as "a really first-class, distinguished and enthusiastic scientific team".

*From 'Atomic Energy' July 1960*



*On the occasion of the official opening of the AINSE building at Lucas Heights in 1960. Left to right: Bill Palmer, Scientific Secretary AINSE; Jack Somerville, AINSE President; and the Minister for National Development, Senator The Honourable W H Spooner.*

## 2.5 Executive Committee meetings

The first meeting of the Executive Committee was held on 4 December 1958. At this meeting two AAEC employees, Principal Field Engineer John Webb and William (Bill) Lynch were also present. John Webb was appointed by the Committee as the acting Executive Officer of AINSE until an Executive Officer could be appointed. It was also noted that, at this time, AINSE had no funds and therefore the AAEC offered to pay all incidental expenses up to £1,000 until AINSE funds became available. It was from this time that the AAEC undertook to administer all the AINSE accounts. The signatories to all AINSE bank accounts included both an AINSE and an AAEC (and later ANSTO) representative. The actual individuals were senior employees of the two organisations and were nominated by Council.

Initially all Executive Committee meetings were held at the AAEC Coogee Head Office while the Council meetings were held at the Lucas Heights Research Establishment and at the member universities in rotation. In 1960 and thereafter, AINSE Executive Committee meetings were held in the AINSE building at Lucas Heights. The number of Executive Committee meetings held annually varied from four to six per annum and the number of Council meetings remained at four until 1990 when it was dropped to one but shortly thereafter rose to two, where it remains today.

## 2.6 AINSE's first administrative head

The Executive Committee decided that the position of Executive Officer was an important and responsible one and its salary should reflect this. They decided that a salary of not less than £3,000 would seem reasonable. (The average wage at this time was about £1,000 per annum.) Advertisements were placed in all the Australian capital city newspapers and major newspapers in the UK. The position was also advertised through universities both in Australia and abroad and directly through the atomic energy agencies in Canada, United Kingdom, New Zealand and USA<sup>35</sup>.

When the Executive Committee met on 28 April 1959, all the Australian candidates for the position of Executive Officer had been interviewed and a short list had been drawn up. There had been a process put in place to interview overseas candidates but at this stage, these interviews had not taken place. The following day the Council met and discussed the Executive Officer issue. Harry Messel believed that none of those short-listed was acceptable for the position. Messel believed that the Executive Officer should also be an experienced researcher similar to the Executive Officer at Argonne National Laboratory (ANL) in Chicago. The Council then discussed, at great length, the nature of the position of Executive Officer. Messel further initiated discussion on a possible increase of salary from the initial £3,000 to £4,000. In the end Council agreed to a salary of £3,500. The Acting Executive Officer, John Webb, attempted to conclude discussion stating *that two previous meetings by University Representatives prior to the inauguration of the Institute had considered its functions in some detail*. Finally, it was agreed that since no suitable candidate for the position had been found, members of Council were asked to nominate anyone they considered suitable.

In June 1959 the position of technical secretary was offered to a preferred London-based candidate at £3,000 a year<sup>36</sup>. The offer was declined and at the Executive Committee meeting on 14 August 1959, Professors Myers and Worner suggested that the person be offered £3,500, and the Committee agreed to this action. The AAEC representatives had their abstentions noted and suggested that an administrative appointment be made with a salary of £2,500, with the appointee being required to hold a university degree.

At the September Council meeting<sup>37</sup>, Baxter moved and Titterton seconded, *'that Council not fill the position of Executive Officer ... but proceed to appoint a scientific secretary at a salary in the vicinity of £2,500 p.a. and the President of the Institute, for the time being act as Executive Officer of the Institute*. It was further suggested that the Executive Committee should make this appointment. Following the Council's decision to accept this motion, Mr E A (Bill) Palmer accepted the offer to take up the post of Scientific Secretary in November 1959. He held a BE(Aero) from the University of Sydney and had experience in university administration.

<sup>35</sup> Minutes of Inaugural Council and Executive Meetings

<sup>36</sup> Executive Committee Meeting 4 June 1959

<sup>37</sup> 4<sup>th</sup> Council Meeting p 3



Photo courtesy of the Australian Academy of Science

### **P**rofessor Charles Watson-Munro OBE FAA

The distinguished career and life of Charles Watson-Munro, AINSE Councillor from 1958 to 1959, 1961, 1963 to 1971 and 1973 to 1980 and AINSE President in 1967 and 1968, and his long association with, and contribution to, AINSE is acknowledged by his colleagues. He was a leading Figure in controlled thermonuclear fusion research in Australia and established the Plasma Physics Conferences.

In 1955 Charles Watson-Munro took up appointment as Chief Scientist with the AAEC where the principal objective of the research program at that time was on the development of nuclear power. In 1960 he moved to the University of Sydney where, as a professor in the School of Physics, he led the internationally recognised Department of Plasma Physics.

Max Brennan in the Australian Academy of Science Biographical Memoirs provides a succinct eulogy to this man of science.

*The combination of scientific and engineering expertise and his personal qualities enabled Charles to make major contributions to science and engineering in four countries. In each country his contribution was at an early stage in the development of a particular technology – radar in New Zealand, nuclear power reactors in Canada and the United Kingdom, and nuclear science and technology in Australia. His contributions in New Zealand and Australia included participation in national committees and as a country representative on international committees.*

Charles Watson-Munro received a DSc from Victoria University of Wellington, New Zealand in 1968 and was a Fellow, Institute of Physics (London), Fellow, Australian Institute of Physics, Fellow, Institution of Engineering (Australia) and a Fellow, Australian Academy of Science (1968)

He received an OBE in 1946.

This eminent scientist passed away in 1991.



At the time of his appointment, Bill Palmer was working as Secretary, Technical Branch, at the University of Melbourne and was involved in establishing a Board of Studies in Nuclear Science and Engineering. While still employed by the University, he was seconded to AINSE and worked from Coogee until 2 February 1960 when he officially commenced with AINSE. On 28 January 1968, Bill Palmer was promoted to the position of Executive Officer.

For the next twenty-eight years, under Bill Palmer's guidance, AINSE steadily grew from the embryonic organisation that it was in 1958. It established a series of conferences and workshops and distributed funds in the form of research grants, fellowships and studentships.

Bill Palmer and the administrative staff acted *in loco parentis* to the many research students and young Fellows who regularly stayed at Lucas Heights. Mrs Jean Kearns, Palmer's assistant, was affectionately referred to as 'Mrs AINSE' by many of these young people from 1960 to 1976.

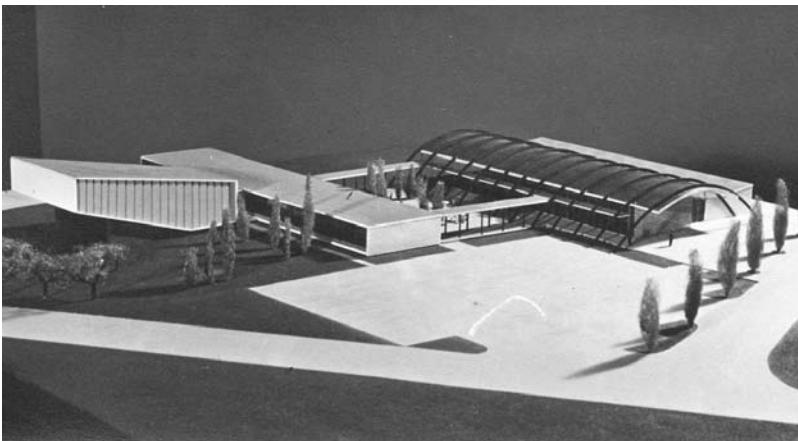
## 2.7 Finances

Much of the success of AINSE has been in the distribution of funds in the form of benefits to the universities. These benefits are principally research grants, postdoctoral fellowships and postgraduate studentships. This success has come from the selection of elite fellows and students and the selection of projects which have made significant contributions to scientific research in Australia. The fruit of this research has been the advancement of knowledge in a variety of different fields by academics and students.

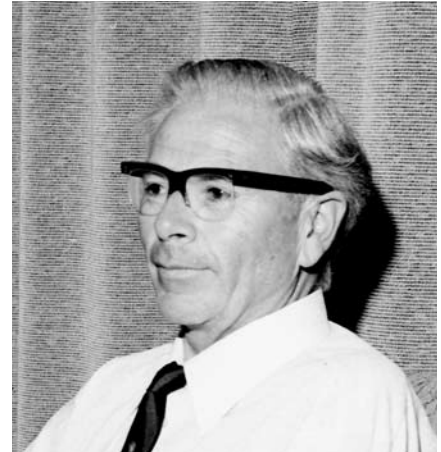
AINSE is an organisation that essentially allocates funds for research. But where does AINSE obtain these funds?

In essence the money has come from three sources: the annual subscription dues paid by all university members; the Commission (now ANSTO); and a research and training contribution made by the Commonwealth Government through the Commission. From 1993 this third component has been subsumed into the ANSTO subscription. The Government contribution paid annually has varied over time. The membership subscription for each university initially was determined by the size of the university. The initial subscription rates are listed in Table 1 on page 5, with the universities committing to membership of AINSE for a period of three years. The Commonwealth Government also contributed an initial amount of £50,000 for research and training purposes.

At this stage AINSE's expenses comprised the payment of salaries to its staff and administrative costs, the purchase of equipment to be used at Lucas Heights by university researchers, the hire of facilities from the Commission and the distribution and allocation of studentships, fellowships and grants that included travel to and from Lucas Heights and accommodation while working there. The provision of travel funding laid the groundwork of one of the enduring aspects of AINSE funding – equity of access.



Model of the AINSE Building Complex 1960



David Allen-Williams in 1973  
Photo 6204P courtesy of UWA archives

### Professor David Allen-Williams

David Allen-Williams was Professor of Mechanical Engineering at the University of Western Australia from 1959 to 1977.

He represented the University of Western Australia on the AINSE Council for the Institute's first years until 1963, from 1965 to 1983 and then 1988 providing valuable continuity and wise counsel throughout this long period. With a background in research in wartime Britain, and an association with civil nuclear reactor development, he contributed much engineering and scientific expertise to AINSE activities, particularly in the areas of heat transfer and fluid flow.

His input into the processes relating to AINSE research awards, postgraduate studentships and fellowships ensured high standards in the development of joint projects between universities and AAEC groups.

He retired to Augusta WA, where he employed his skills as a church organist. He always maintained an active interest in science and technology.

Bill Palmer said

David was very supportive of AINSE's role in promoting research in engineering aspects of the nuclear field, and was instrumental in establishing the series of AINSE Heat Transfer and Fluid Flow Conferences which involved staff and research students from academia and industry.

David Allen-Williams passed away in July 2004, aged 86.