

Introduction



It is somewhat pretentious to call the present work a history. Instead, a scrap book has been assembled to remind and stimulate the pioneers to reminisce, and to preserve some aspects of the past for the more recent arrivals. Fifty years is a long time, long enough that significant parts of the School's history will become irretrievable if not captured now. There are many old photographs, but already not all the faces are identifiable, nor is the significance of the subjects of some apparent. Record keeping has been deficient, despite the noblest of intention. Much of the School's history remains in the memories of an inevitably decreasing few. It is to be hoped that the following pages will provoke the emergence and documentation of new facts, different interpretations and stories for future chronicles.

Since 1950, the School has grown to become a large and complex organisation. It has attracted outstanding research staff and graduate students (more than 500 PhD graduates have been produced) as well as large numbers of international visitors. Some thousands of people (an indeterminate number, but well over 400 in Nuclear Physics alone, for example) have toiled at whatever their particular abilities within its confines. All have contributed to the overall atmosphere and character of the School and have helped to make it an internationally known and respected centre of physics and engineering research.

For the most part, information from University, School and Department annual reports has been augmented by the recollections of early comers to the School. Two excellent biographies, those of Sir Mark Oliphant by Stewart Cockburn & David Ellyard and of Sir Ernest Titterton by John Newton, have been used freely as sources. The papers of the founding and later heads of departments have not been examined. Undoubtedly, a rich harvest of supplementary information and detail awaits those that would undertake a more thorough and scholarly approach. Otherwise, it is believed that the material presented is accurate and sufficient for the purpose at hand.

School sections, past and present, were invited to contribute summaries of research achievements and any other events worthy of note. These contributions, inter-leaved with a central narrative, provide interesting contrasts of style and illustrate the breadth of both the activity and personality that the School has nurtured.

Generally, honorifics associated with people have been omitted because they change over time. So too do units and the names of buildings and organisations. With them, the terminology at the time has been used.

Thanks are due to the many who have assisted with recollections, photographs, comments and suggestions. In particular, Roma Blamey, Fred Barker, Ray Spear, Peter Treacy, John Gascoigne, Tony Cullen and Ken Inall provided personal photographs (and other records) to augment the extensive collection assembled over the years by Tony Brinkley. Ken Inall, Tom Rhymes and Vince Ford of MSSSO provided contributions that have been incorporated into the text. Mrs Gill Taylor and Mrs Marilyn Holloway produced the text with commendable efficiency, the more so given the cut and paste techniques of one of the authors. Tim Thompson was responsible for electronic scanning of a wide range of material and the subsequent layout. All credit for the format is his, the authors lay claim only to responsibility for errors and omissions.

The cooperation and assistance of Zara Struik and staff of the Records Section are gratefully acknowledged.

During the final phases of preparation, the commissioned history, *The Making of the Australian National University 1946-1996* by Stephen Foster and Margaret Varghese (Allen and Unwin), was issued. Obviously this splendid and comprehensive history and the present more parochial work share some common ground. However, histories are not unlike wildflower books, where one book can neither include all the species, nor present the best guides for identification throughout. So it is too with events and interpretations. The history buff, no less than the nature lover, needs complementary texts.

More technical detail is given in the present work, though much of it is tucked away in the end notes. Even so, the balance of detail is sometimes other than would have been expected. For example, the “coming of democracy” to decision making within the School is only referred to in passing here, whereas the ANU history devotes much attention to the relevant events. The difference reflects a more general one of approach. Where Foster & Varghese explore many of the circumstances preceding events and appointments - in a sense uncovering the strategies of the generals; here the emphasis is more on outcomes as a view from the trenches.

Though it was tempting to modify some sections for whatever reason, be it rebuttal, explanation or greater emphasis, no changes were made save to choose several alternative photographs to avoid duplication.

R.S.Phys.S.E. in 1996



Chapter 1
Genesis of a University and a School



The Prime Minister Ben Chifley laying the foundation stone of the Research School of Physical Sciences on October 24 1949. The stone was relocated several times and is now at the right hand side of the main entrance of the Oliphant Building.

A Perspective

The Australian National University, to be comprised of as many as four Research Schools, of which Physical Sciences was one, was established by the ANU Act. The legislation, introduced by the Minister for Post-War Reconstruction, John Dedman, was assented to on August 1 1946 and proclaimed to commence on February 7 1947.

A university, in essentially the same location as that now occupied by the ANU, was a feature of Walter Burley Griffin's successful entry in the international competition of 1911/12 for the design of the new capital, Canberra. Subsequently, the first official Commonwealth endorsement of the Griffin plan appeared in the *Gazette* of November 19 1925. Aside from Parliament House and the proposed Capitol, the only other buildings indicated were those of the university¹.

Some of Griffin's concepts in the original entry were idealistically pragmatic and decidedly parochial, with the location of medical studies near the notional hospital, government and business close by a municipal centre and agriculture adjacent to a botanic garden and forest preserve. Others, at least by present day standards, seem quaint. A generic diagram categorised some twenty-seven faculties in all. Anthropology was one of the Natural Sciences, psychology and sociology amongst the Theoretic Sciences and logic and economics with Applied Science. Geology was labelled as Descriptive, physics and chemistry Derivative, while Experimental faculties included mineralogy, physiology and meteorology. There was to be a long gestation, albeit that in delivery, the university differed greatly from the first conception.

After gazettal of the plan for Canberra, Cabinet agreed in principle to establishment of university facilities as recommended by several committees convened in 1926 and 1927. At a Royal Commission on the Constitution that was held during the same period, T.H. Laby, Professor of the Department of Natural Philosophy (now the School of Physics) at the University of Melbourne, suggested that "a great national research and residential university should be founded in Canberra". Wise and ultimately prophetic words certainly, but he had cause to regret them some twenty years later. However, a university was not established. Instead, the Canberra University College was created by ordinance in 1929 to operate as an outpost of the Uni-

versity of Melbourne. The college was always intended as a temporary expedient, but the depression and World War II conspired to assure its continuance for just over thirty years.

The events of World War II revived, or created afresh, concerns about research training in Australia. Prime Minister John Curtin had discussed a possible medical research institute with Howard Florey, the developer of penicillin, in 1943. Later, the cataclysmic end of the war at Hiroshima and Nagasaki heralded the nuclear age, serving to highlight further that Australia was ill-equipped to face the future. Government advisers, notably Herbert "Nuggett" Coombs as Director-General of Post-War Reconstruction, and senior politicians returned to the concept of a research university.

Prime Minister Ben Chifley, with an entourage of colleagues and advisers, went to London in April of 1946 for a Commonwealth Prime Ministers' conference. Chifley and Coombs proposed to use the opportunity to explore the possibility of establishing a research university of international standard around a core group of eminent, ex-patriate Australians then in the United Kingdom. Florey of course was one, Keith Hancock, the historian, another along with the physicists Harrie Massey and Marcus Oliphant. Massey was first approached but recommended Oliphant, as an experimentalist, instead. A dinner engagement was arranged for Oliphant to meet with the Prime Minister and others.

The authors of the biography of Oliphant, Stewart Cockburn and David Ellyard², assert that the meeting in April 1946 was a watershed occasion; clearly true for Oliphant himself but, as they present the facts, no less so for the ANU as well. Certainly, events moved quickly thereafter, seemingly driven by both the desire of Chifley and Coombs to attract Oliphant back to Australia as a founder, and an implied willingness by Oliphant to return. The Act establishing the ANU was passed within four months, being supported and assisted by the Leader of the Opposition, Robert Menzies.

Thereafter, Florey, Hancock, Oliphant and Raymond Firth, a New Zealand born anthropologist, acted as advisers, formally becoming the Academic Advisory Committee in April 1948. From the outset, the advisers were seen as likely Directors of the four schools to be established. In fact though, Oliphant alone made the bold step when it



The “hole” that was to become the magnet pit (early 1950).

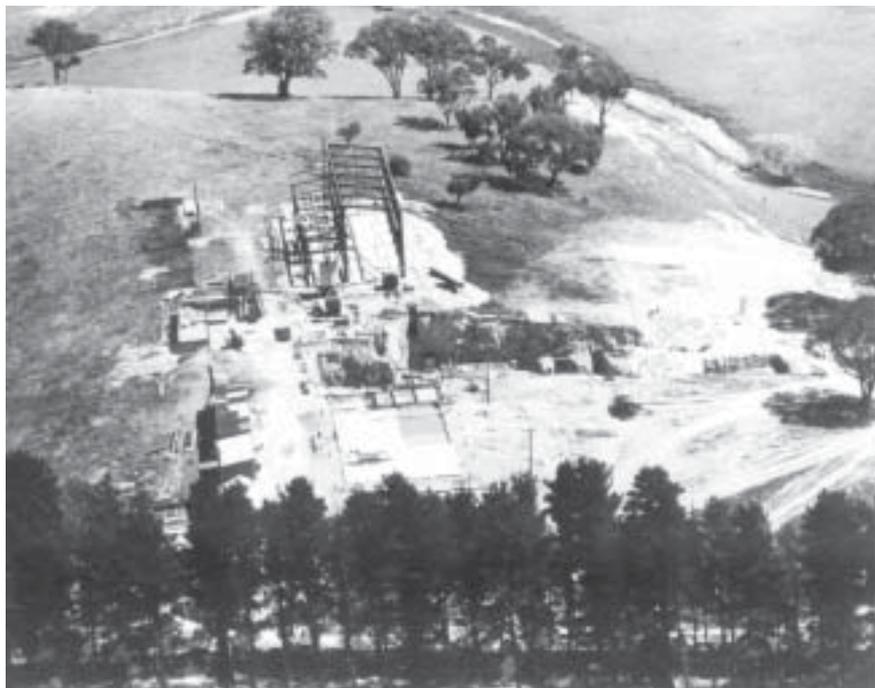
was most needed. His acceptance of the Directorship was finally announced by Chifley on October 20 1948. Intervening difficulties with funding and Canberra building plans, of both laboratories and a residence, had delayed the decision. The former was resolved after Oliphant flew to Australia early in 1947. Remarkably, he was allowed to address Cabinet and shortly afterwards, substantial augmentation of funds for a “School of Nuclear Physics” was approved, provided that Oliphant agreed to become Director. The original amount of £120,000 earmarked for the School was increased to £500,000. It is hardly surprising that Laby in Melbourne, where a modest nuclear physics research program had begun in 1938, and others in State universities were less than supportive of the new venture. The total annual research grant in Australia for all universities, in all faculties was only about £30,000 in the immediate pre-war years.

Side by side in raw comparison, the amounts could, and did, provoke intense envy and animosity toward the new, “spoiled” institution. Readily overlooked was the fact that the seemingly large sum was spread over as many as five years and included

building and infrastructure costs as well as salaries. Even now, critics of the ANU compare the total ANU grant with research funds available to the Australian Research Council. More realistic indicators, such as research funding per staff member, make it clear that, whatever obtained in fact or fancy during the founding days, the ANU is not now disproportionately funded.

Even after acceptance, Oliphant’s return hung in the balance on several occasions. *Inter alia*, several staffing issues emerged. Finally though, the Oliphant family embarked on July 11 1950 and arrived in Canberra in mid-August. Florey had predicted there would be “a hole in the ground and a lot of promises”. At least half of the prophecy was doubly correct! There were two such holes, one at the new laboratories and the other at the site of the intended residence.

Any analysis of a course of events, and of the influence of particular individuals on them, is rarely accepted universally. Nonetheless, it seems difficult to conclude other than that Oliphant was the essential catalyst that led to the establishment of the ANU



▷ A view of the building site not very different to that the Oliphant family found in August 1950.

◁ Aerial view of the overall building site of the Cockcroft Building and the accelerator wing (mid-1950).

∇ The early preparations at the building site of the Cockcroft Building (circa January 1950).

at that time. He was the right man in the right place at the right time. Such issues aside, the Research School of Physical Sciences was unarguably the pioneer school of the fledgling ANU in every sense.

RSPHysS had the foundation Director and the earliest academic and technical staff appointments. John Gooden (June 1 1948) and John Symonds

(June 27 1948) were appointed as Research Fellows³ and Sidney “Mick” Cornick and Maurice “Jimmy” Edwards as Chief Technical Officer and Senior Technical Officer respectively on October 1 1948. All four were then in Birmingham, where they began to work under the supervision of Oliphant planning new facilities for Canberra, being paid by the ANU from the indicated starting





dates of appointment. The first substantial buildings undertaken on site were those for the laboratories of RSPHysS and University House. Preparations for the building that was later named the Cockcroft Building and the accelerator wing began in late 1949.

Cornick was sent ahead in June 1949 to organise materials and equipment that would be needed and to assist and advise the architect and builders⁴. He witnessed the busy activities of October 24 1949 when foundation stones were laid by Chifley at the Cockcroft site and near the site of the Medical School workshop, and by Dedman at University House. The former two are now at the entrances of the Oliphant and the John Curtin buildings. Cornick dined out for years on the story “of the day he drank beer with the PM”. Assertion of his unique pioneering role as the first member of any School to take up duty at Acton would have been no less impressive.

Finally, the School led the way in research. A small, separate building, added to the original plan in order to house a 1.2 million volt Cockcroft-Walton accelerator, was completed around November 1951. The accelerator was installed in the following months, allowing research measurements to be be-

gun with it by Ernest Titterton in early February 1952. By then, other ANU appointees associated with the John Curtin School of Medical Research were carrying out research in laboratories in Melbourne, Otago and London. Nevertheless, the School can proudly claim to have conducted and completed the symbolically important, first research with newly-established facilities on the campus, almost five years to the day after the ANU Act commenced.

Early Staffing - The ANU at Birmingham 1948-9

Oliphant’s early plans seem not to have been elaborated publicly during the early years, beyond the general understanding that he would establish nuclear research facilities. Since he was then building an accelerator at Birmingham, it was assumed that he would set about another “atom-smasher” in Canberra. For the general public and even the politicians, the potential existence of an atom-smasher, dimly enough understood without the complications of detail, implied an impending national achievement. Evidently, there was vagueness in other spheres. The *Sydney Morning Herald* of February 2 1949 carried a report from a London correspondent stating that “well-informed observers expect that

a cyclotron (“atom-smasher”) will have been installed by the time the professor and his staff arrive in 1951”. Forecasts are easily criticised with the benefit of hindsight. However, disregarding the overall naivety of the remark, those observers clearly had no appreciation of the important fact that Oliphant’s interests were directed toward the design and construction of accelerators, rather than their research use. That focus of interest was to have a profound influence on the events of later years.

Details of the proposed 2 GeV cyclo-synchrotron were finally published in *Nature* in March 1950⁵. Clearly though, intensive effort involving design evaluation, feasibility studies and planning had preceded the publication. Oliphant had briefed the Interim Council on his plans during the visit to Australia in January 1947, and again when the four advisers came to Canberra in March 1948. Sufficient detail of the layout and requirements for the accelerator must have been available, at least in broad outline, prior to discussions with the site architect, Brian Lewis, both in London in 1947 and in Canberra in 1948.

Recruiting of staff to assist with the design and planning in fact anticipated Oliphant’s formal acceptance of the Directorship. Appointments for Gooden, Symonds and Chaudhri were approved by the Interim Council in May 1948 with notional commencement on June 1. Chaudhri, formerly associated with Oliphant at Cambridge, was already a Professor at Muslim University in India and did not accept the offer of a five year Staff Fellowship. The short term apparently reflected strictures imposed by the White Australia Policy. Symonds had held a CSIRO Scholarship in the UK. After some muddling of dates, his appointment began on June 27 1948, the day after completion of his scholarship. Thus Gooden emerged as the first member of the academic staff of both the School and, aside from Vice-Chancellor Douglas Copland who was appointed one month earlier, of the ANU on June 1 1948.

Gooden, a highly regarded accelerator physicist and researcher, was expected, as Oliphant’s right hand man, to provide much of the impetus and expertise that the ambitious venture was clearly going to need. Tragically, the expectations were not to be realised. Gooden died in Adelaide, his home town, on June 9 1950 having been flown there from Birmingham, at ANU expense, when the medical prognosis of



“Mick” Cornick (23/7/1902-17/8/74). A portrait entitled “The face that sank 1000 schooners”.

his illness became known.

Meanwhile, Astronomy and Geophysics were being examined as likely components of the School. The Director of the Commonwealth Observatory at Mount Stromlo, Richard Woolley, was carrying out first-rate research there and association of the nearby observatory with the ANU was taken to be a natural and desirable development. Geophysics was suggested by a wider group of advisers consulted by the Academic Advisory Committee, in recognition of the economic importance of mining in Australia.

However, the earliest appointments and planning focussed on the accelerator. Aside from the physicists and engineers that were to build the machine, it would be necessary to develop a group of experimentalists and radiochemists to use it, along with theoretical support. In time, the Departments of Nuclear Physics, Radiochemistry and Theoretical Physics evolved with Nuclear Physics including both the machine builders and experimentalists. Initial appointments though were to the School without such identification.

Radiochemistry had played an important role in both the discovery of fission and its subsequent exploi-

tation to produce plutonium for the second atomic bomb. Thereafter, radiochemical techniques were used for research measurements with accelerators and applications of radio-active tracers in diverse research areas were either being undertaken then or foreshadowed enthusiastically. Further, Oliphant was alert to the potential linkage between radio-chemistry and the still-putative Geophysics group that could stem from radio-active dating methods based, for example, on the uranium decay chain in rocks and minerals. Indeed, he sought unsuccessfully during 1949 to attract the American chemist Martin Kamen, the co-discoverer of carbon-14, to the ANU. Unfortunately, Kamen was unable even then to get a US passport to leave the US because of an alleged security breach in 1944, while he was associated with the Manhattan project.

By the end of 1949, a small team had been established at Birmingham to work on the accelerator project. Gooden, Symonds, Len Hibbard, Ken Champion and Jack Blamey had been appointed as Research Fellows with a technical support group comprising Barry Shenton, a design engineer, David Walker as draughtsman and Edwards as a Senior Technical Officer. Fred Barker, who had just completed his PhD in Theoretical Physics at Birmingham, was appointed as Research Fellow also, thus becoming the first non-accelerator staff member of the School. He went to the Institute of Theoretical Physics in Copenhagen for the 1950/51 academic year prior to returning to Canberra.

Cornick of course was in Canberra. Blamey, at Birmingham on an ANU travelling scholarship until becoming a Research Fellow on January 1 1950, had come to Australia with Cornick in June 1949 to survey resources available for building the accelerator. Together they visited Melbourne, Canberra and BHP, Port Kembla to negotiate the supply of special steel for the magnet. Blamey returned to Birmingham, but Cornick stayed in Canberra.

It is pertinent to note that all of the Research Fellows were Australians. Aided by the circumstance of them having been attracted to Birmingham to work on the 1 GeV synchrotron being built there, Oliphant clearly sought to appoint suitably experienced and qualified Australians wherever possible. As evidenced by the attempted appointments of Chaudhri and Kamen, and later senior appointments, there was no reluctance though to cast a wider net. Already the ANU was fulfilling the role of attracting Australians to return home, a role that

continued in both RSPHysS and the other three schools.

In the period between 1948 and 1953 while facilities were still being established in Canberra, the ANU provided travelling scholarships for Australians to undertake graduate study in the UK. Six such scholarships were associated with the School. In due course, all of the scholarship holders returned to Australia, three of them to the ANU - Stuart Butler from Birmingham, John Carver from Cambridge and Ian Wright from Glasgow.

The School moves to Acton - 1950

Four School staff members were on campus at the end of March 1950. Cornick had been joined by the Laboratory Manager Ron Purchase in February, while May Rice, appointed in the UK on January 1 1950 as secretary to the Laboratory Manager, and Edwards arrived in March.

At that time, and indeed until 1959 when the Boeing 707 rapidly changed the economics and graciousness of globe-trotting, ocean travel was the only affordable means of long distance transportation. Staff coming to Canberra were paid from at least the time of embarkation, some considerably before then depending on circumstance. As a matter of course, academic staff were provided with first-class berths, while students on travelling scholarships were accommodated in the nether regions of tourist class. Early technical staff such as Edwards posed a problem. The London-based representative for the ANU, Edward Clark, determined that technical staff were "at the lower end of staff"; a judgement, it is to be hoped based only on relative salary, that meant that tourist class was deemed appropriate. The practice of salary payment whilst travelling has made it difficult to establish when staff arrived in Canberra. Early records meticulously associate a date with each appointment, but it is of course unrelated to actual arrival.

Another technician, Dick Goldberg, was appointed in April and arrived in May.

Oliphant was next, in mid-August, to join the small contingent at what was little more than a camp site. Gooden's widow, Claire, became his secretary the following month. Gradually, members of the Birmingham group re-assembled at Acton, Blamey and Shenton came in October. Walker apparently took up alternative employment in the UK for some time

before coming to Canberra in 1952. Hibbard remained in Birmingham to gain experience with the synchrotron there until 1954. Some of the early Research Fellows did not come to Canberra. Gooden died before he could do so, Symonds resigned to accept a post at Birmingham (he returned to Australia some years later to join the newly-established Australian Atomic Energy Commission at Lucas Heights) while Champion completed a PhD at Birmingham in 1950 and subsequently joined a group at MIT in Cambridge, Massachusetts.

One other technical appointee, Peter Darling, arrived in November. He was a carpenter. Later, his woodworking skills became legendary for the production of beautifully crafted farewell presentations. In the early days though, benches, shelves and no small amount of general joinery were the first priorities. Darling retired in 1991 after more than forty years of loyal service to the School.

At year end, the School complement at Acton stood at ten. However, the staff list at that time included two names that represented important developments destined to shape the future of the School.

The appointment of Ernest Titterton as Professor of Physics was announced in March⁶ and he started duty as an ANU member while still at Harwell on September 1 1950. Titterton had been Oliphant's first student at Birmingham and became a prominent member of the British group at Los Alamos between 1943 and 1947. Later at Harwell, his research involved use of cloud chambers and emulsions - both likely techniques for research with a high energy accelerator. In April 1950, the decision to purchase a 1.2 million volt Cockcroft-Walton accelerator was reported as a consequence of Titterton's acceptance of the Professorship. Though the intention was plainly to provide interim facilities until Oliphant's accelerator was completed, the Cockcroft-Walton was to be the first of a sequence of accelerators under the stewardship of a Nuclear Physics Department that became separate from the machine-building activities of Oliphant and his team.

A second appointment was an Honorary Professorship for Richard Woolley of the Commonwealth Observatory on July 1 1950. A Department of Astronomy was to be located at Mount Stromlo under Woolley's leadership. The following year, Woolley was joined by an ANU-appointed Research Fellow Gerard de Vaucouleurs and Antoni Pryzybylski, the

first student to be enrolled for a degree at the ANU. Some years on, a group of pioneers decided that Foundation members of the university were those appointed on or before December 31 1950. This was the source of chagrin for several pioneers, especially Titterton's research assistant (later Senior Technical Officer) Tony Brinkley, since they missed the distinction by the barest margin of one day - and that at a time when the starting date was more than somewhat arbitrary.

A list of those so-called Foundation members associated with the School is given in Appendix I.

The Later Years 1951-56

Staff and graduate student numbers throughout the ANU grew slowly but steadily with the passage of time, tempered by slow building progress, the constraints of funding and, no less importantly, the availability of suitable academic and technical staff. Postgraduate training was uncommon in Australia during the fifties. Understandably, the seven other universities strove to retain those few graduates who evinced interest.

The rate of growth of both the School and the ANU can be gleaned from various lists published by the University. In March 1951, total academic staff of the ANU eligible to vote for Council members numbered 28, of which the School complement was 8 (including the two Research Fellows that did not come to Canberra). By October 1952, the corresponding numbers were 71 and 16.

Housing accommodation for new staff was a constant problem. The University bought some houses and flats and set about building others - as of July 1950, the *University News* reported that it was not possible "to make much use of the government's housing list, for houses from it are allocated in strict order of place on the list. Special priority has been successfully argued for an odd house or two." Evidently though, some wider priority rating was accorded to the ANU later. During mid-1951, new arrivals were provided with temporary accommodation, at the Hotel Kurrajong for example, for some weeks before being allocated the first available government houses. Even so, some dissatisfaction was expressed. After all, the new immigrants had been promised accommodation on arrival, but had to wait a short time before being settled. The locals on the long waiting list were of course rather more resentful.

While the School had been successful attracting many promising Australian physicists and accelerator engineers, the sustained reliance on British technicians and machinists was one of necessity. Even well into the sixties, technicians were still being recruited from the UK and many local appointees were former UK migrants, at first employed in Australian industry.

Three early appointments in mid-1951 of microscope scanners to the group being established by Titterton were the fore-runners of a new source of technical and workshop staff. All three were women, two Latvians and one Lithuanian, who had come to Australia as displaced persons in the immediate post-war period. They were “Balts” in the jargon of the time, a term first used as convenient identification but later, regrettably, more commonly with derogatory connotation. The Australian Government drove a hard bargain with such migrants. They were compelled to work out the cost of their passage by undertaking directed employment for two years. The situation of medically or legally-qualified ditch-diggers was reportedly not uncom-

mon. One of the three, Margarita Strautmanis, had been a waitress at Lawley House in Canberra to fulfil her obligation. She continued in the Department of Nuclear Physics, becoming one of the few women technical officers at the ANU, before retiring after 29 years of service.

Announcements were made of the appointments of John Jaeger, then Professor of Applied Mathematics at the University of Tasmania, as Professor of Geophysics and of Frank Scarf as Reader in Radiochemistry in March 1951. Scarf was an Area Chief Scientist with the National Coal Board in England, though evidently without any experience in radiochemical research. He had been a neighbour of the Oliphant family in suburban Birmingham. Both Jaeger and Scarf began duty in early 1952.

The association of specific fields with these two appointments was unusual within the School, having been done only once previously for the honorary position of Woolley. It did not become common practice to do so for Research Fellows until about 1955. No doubt influenced by the small total



The temporary building, completed by March 1951, that was used as a store, workshop and darkroom. Situated near the present Research School of Earth Sciences, it was demolished to make way for the Rock Mechanics Laboratory in 1957.

The microscope “girls” with Mick Cornick in late 1951.

L to R, Sheila Miller, Lily Velioniskyte, Mick Cornick & Margarita Strautmanis.

Lily and Margarita were two of the three migrants first employed in the group.



number of School staff, there was a gradual evolution of a department structure. In the *University News* of June 1951, the School staff list contained no departmental identification except for those in the Department of Astronomy. For the other three Schools, with few if any staff actually in Canberra, a complete breakdown of staff by department was given. A departmental structure for the School was first provided by the ANU Annual Report of 1951 and, in similar form in October 1952, in a glossy booklet that reviewed progress of the ANU. In both, the five foundation departments were shown as Astronomy, Geophysics, Nuclear Physics, Radiochemistry and Theoretical Physics. Nuclear Physics contained both Oliphant's accelerator team as well as the experimental nuclear physicists working under Titterton (Appendix II). Subsequently, without comment, the 1952 ANU Annual Report listed two departments, Particle Physics and Nuclear Physics, headed by Oliphant and Titterton respectively. Outwardly, it would appear that the fission was a benign administrative arrangement rather than a cataclysmic event. None of those in the School at the time, who has been asked to comment, has any clear recollection of the change. Even so, given the personalities and strong wills of the two men involved, it is tempting to speculate that there may well have been a stormy interlude before the separation.

The later years were marked by further sadness.

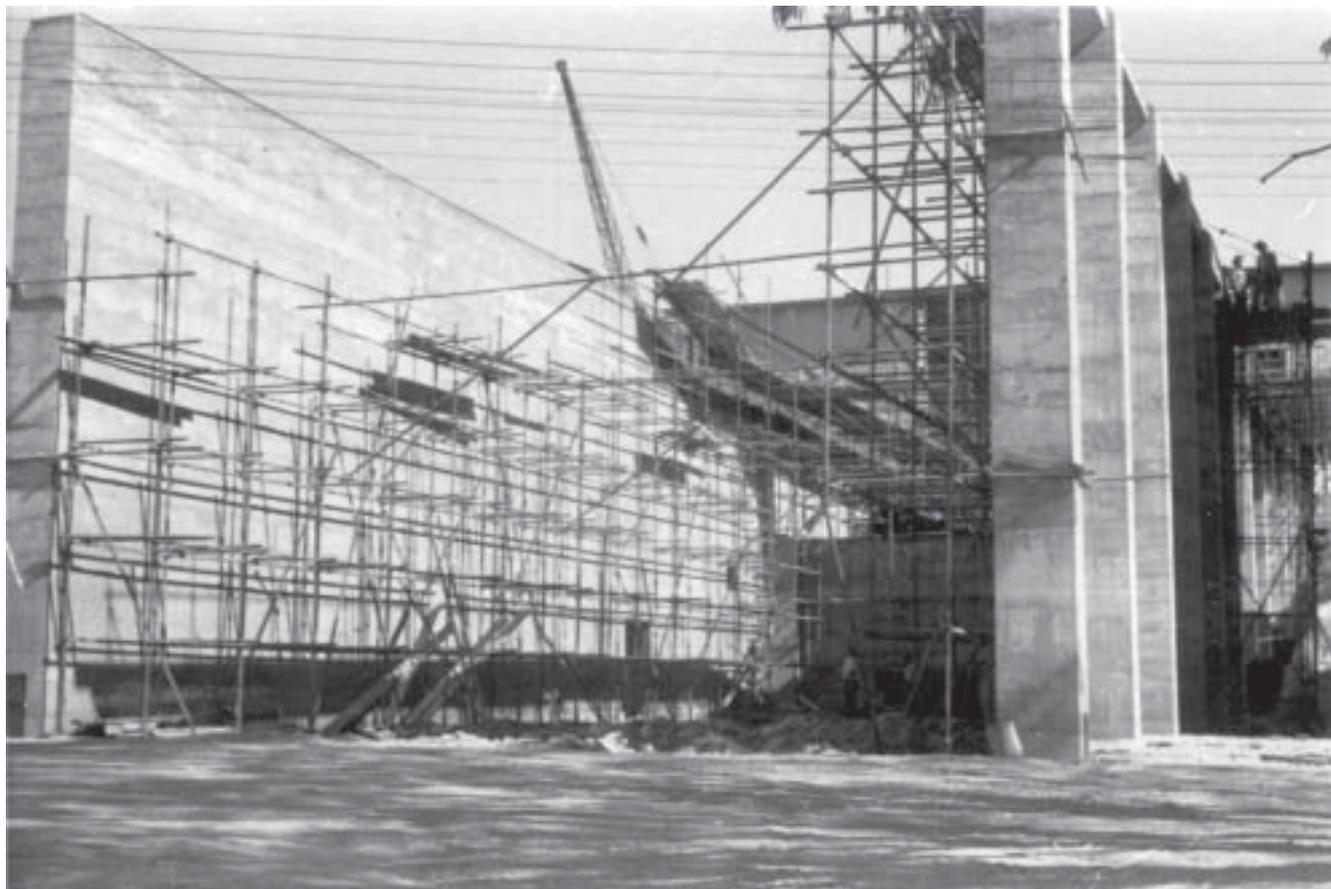
Two unexpected deaths occurred, that of Bill McCall (appointed February 1 1951), the first workshop foreman, in July of 1953 and of Bob Wilson in 1954. Wilson (appointed January 1 1951) was a Fellow, having been recruited to work on the radio-frequency elements of the cyclo-synchrotron.

At the end of the first decade of the ANU's existence, the School was well and truly established and forging the beginnings of an international reputation. Many of the early visions and plans had been realised. Laboratory and office accommodation was complete and there were five active departments, all with high calibre staff and graduate students, involved in mainstream research. The remaining department, Particle Physics, had passed a number of project milestones of the accelerator, including completion of the 136" magnet.

There were 31 academic staff, 14 graduate students and 22 technical staff at the end of 1956⁷. Two Astronomy students were awarded PhD degrees in 1954 and 1955, while a further six theses from Geophysics, Nuclear Physics and Astronomy had either been submitted or were nearing completion. Because of the small total staffing of the School and the existence of one central tea room (there was another in the Cockcroft building for workshop staff), mixing between both technical and academic staff of the departments, and the level of awareness of activities in the School, were better than at any



The Cockcroft Building as of February 14 1952.



The accelerator wing as of February 14 1952.



A view from the race-course (March 4 1952).



◁ *The first laboratory manager, Ron Purchase, surveys the site for the High Tension Laboratory that was to house the 1.2 MV Cockcroft Walton accelerator (1950).*

▷ *The completed High Tension Laboratory with the slowly rising formwork of the accelerator wing behind it (21 April 1952).*

The concrete and brick control room and target area for the accelerator. The structure is still within the Nuclear Physics complex, housing the 2 MV Van de Graaff now used by the Department of Electronic Materials and Engineering (mid 1951).



time subsequently. School seminars were more informal, often being progress reports and student presentations akin to what are now confined within departments. Even so, almost all academic staff attended.

The School's central facilities, comprising a large and well-equipped mechanical workshop as well as electronics, glass-blowing and carpentry sections, headed by Andy James, Frank Reynolds, Bill Tys and Peter Darling respectively, were functioning well. All provided valuable support to the experimental departments, both in assisting their establishment and by producing state of the art research equipment.

It had been possible finally to appoint an outstanding theorist to the headship of Theoretical Physics. Ken Le Couteur, well-known for his work on the statistical theory of nuclear reactions and on beam

extraction from cyclotrons, arrived in May 1956 to take up the position. Inevitably perhaps, almost as soon as the important senior positions seemed at last complete, there was to be change. Woolley resigned to become Astronomer Royal at Greenwich. Another outstanding astronomer, Bart Bok from Harvard, was appointed in his stead. At the same time, the Department of the Interior had agreed to transfer control of the observatory to the ANU. Formally, the transfer occurred on January 3 1957.

There was one storm cloud on the horizon. Completion of the cyclo-synchrotron had been anticipated in two to three years from a somewhat ill-defined date. Whatever that date, should it have been that of the publication in *Nature* in March 1950, the time of Oliphant's arrival in Canberra in August 1950 or even that of the long-delayed completion of the Cockcroft Building in September 1952, it was obvious by 1956 that the accelerator



was much behind schedule. In fact, expected completion was still to be within two or three years. What had started as the *raison d'être* of the School was perhaps to become its *bête noire* instead.

The Early Buildings of the School

The first buildings, those for the School and University House, were started during the difficult period of post-war reconstruction when there were severe shortages of materials and skilled labour. For example, bricks were rationed, with the ANU being allocated 12% of the total Canberra quota.

Progress was slow. The March 1950 maiden issue of the *University News* noted that bulldozers and high explosives were being used on the excavations for the Physics building. The confident claim in the April *News* “that the main excavations are now complete and building operations are about to begin” conflicted with later reports that “excavations of the accelerator block have only recently been completed” (July) and “excavations for the accelerator wing are nearly complete” (October). Fabrication of the structural steel work began mid-year and erection of the girder work for the workshop wing was complete by October. All in all, progress was deemed to be extremely unsatisfactory, with

completion then anticipated for September 1951. Because of the delays, the decision was made to erect a temporary building of some 2000 square feet. It was complete and ready for use for a workshop, a photographic darkroom and a store by March 1951.

By June 1951, some optimism had returned. The rate of progress was regarded as more satisfactory with the roof and walls complete. Hope was expressed that progress would continue to be favourable.

Thereafter, the *University News* diverted its attention to more cheerful happenings, with scant mention of the School's buildings. Certainly the pious hope of the June issue was not realised. It was to be August/September 1952 before School staff moved into the Cockcroft Building. It was so named at a ceremony on September 5, when it was declared open by Sir John Cockcroft with Prime Minister Menzies in attendance.

The accelerator wing languished with no other name until, extended and refurbished, it became the John Carver Building in 1994. An intention to name it the Gooden Wing, in memory of the first School staff member, was stated in the ANU Annual Re-



port of 1951, but clearly was not carried out, for whatever reason.

At last, the School had a home, albeit without the planned offices since the adjacent building, to be known initially as the Chifley Building, was not to be ready for occupation until April 1954. In 1950, School members had shared quarters in the temporary wooden huts that had been erected for administration, in the vicinity of the present Law School and Asian Studies Building. Next, they moved to the Old Hospital Buildings. An electronics workshop was established there and Brinkley set up emulsion processing and microscope scanning facilities for Titterton's early research measurements. The Old Hospital Buildings, also referred to in early reports as the Acton Government Offices, gradually became available to the ANU as their inhabitants, including the Department of Immigration and the News and Information Bureau, were located elsewhere. Once RSPHysS moved to the Cockcroft Building, the buildings became the temporary homes of the Research Schools of Social Sciences and Pacific Studies and of the library. Many of the original Old Hospital Buildings, and indeed some of the huts associated with the temporary administration, remain to this day. Following the appoint-

ments of both Titterton in 1950 and later, of Jaeger in 1951, additions were made to the original plan.

Decisions to purchase a 1.2 million volt Cockcroft-Walton accelerator and to erect a small, separate building for it were announced in April 1950. By the end of the year, planning of the steelwork for the building was complete and "the procurement of steel for this purpose put in hand". A construction contract was let around March 1951 and the building was sufficiently complete to allow the installation of the accelerator to begin in early December.

In parallel during 1951, several other separate buildings were undertaken for Geophysics. The first was completed in June 1952 and the second section, comprised of five offices, in 1953. Always with buildings, completion dates are somewhat indeterminate. For example, the Annual Report of 1952 stated that the Geophysics building was complete as of June 1952, though without most services. Again, Titterton, having carried out the first research measurements with the new accelerator in February 1952, then had to shut the accelerator down for three weeks so that painting of the building could be completed and floor coverings installed.

◁ *Sir John Cockcroft making the inaugural speech on September 5 1952. Seated from left to right are “Nuggett” Coombs, Prime Minister Menzies, Herbert Evatt, the Leader of the Opposition, and Vice Chancellor Douglas Copland.*

▷ *The newly-completed Chifley Building (30 June 1954).*

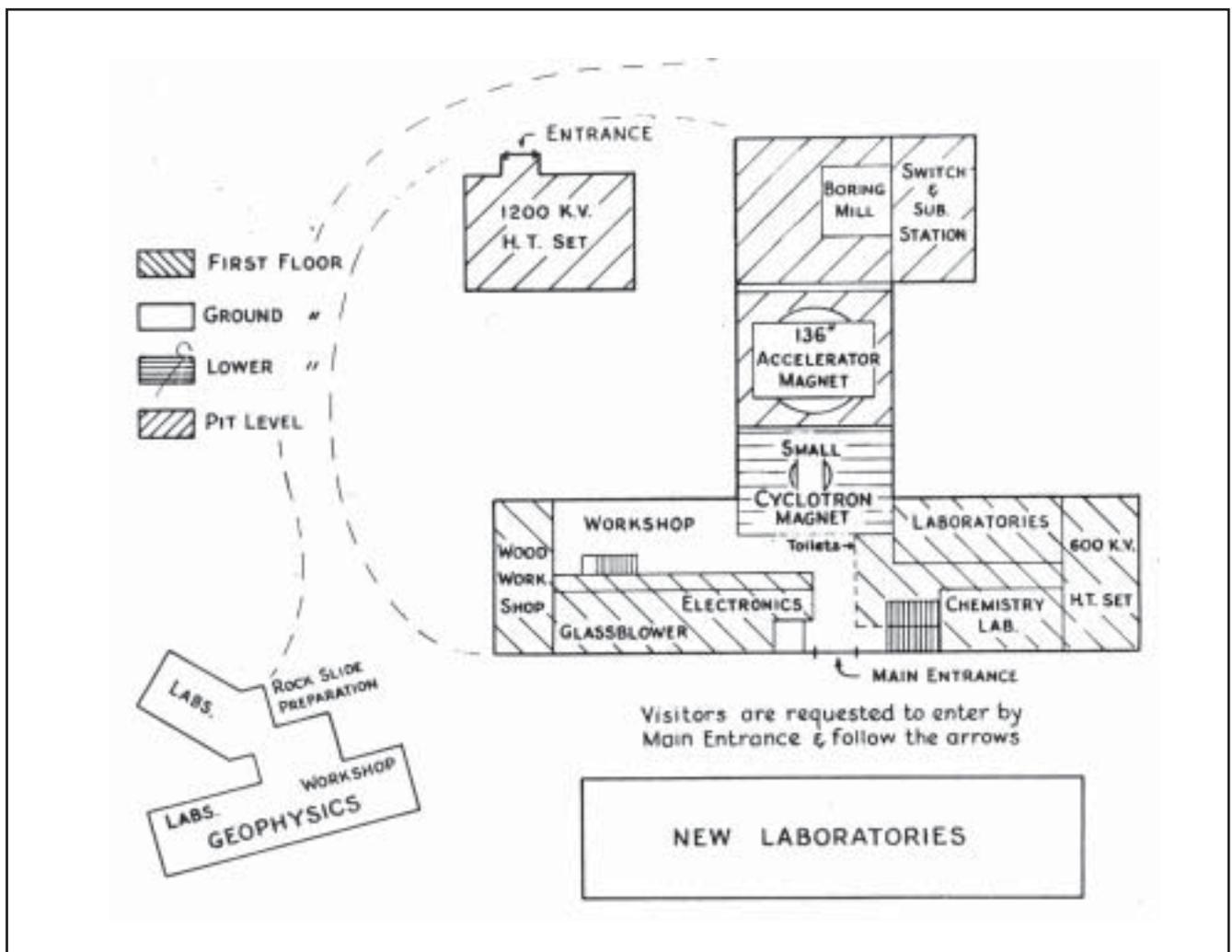
∇ *A plan of RSPHysS taken from a brochure prepared for an Open Day held on November 13 1953.*



Two other projects were undertaken in the first decade. The workshop section of the Cockcroft Building was extended by two bays in 1955, and the “roundhouse” was built during 1956.

The roundhouse, described in the 1956 ANU Annual Report as an octagonal hut, is still evident,

though partly melded into surrounding structures, and is plainly twelve-sided. Built by School staff under the supervision of Darling, it was to accommodate an air-cored magnet that would define the beam orbit of the Oliphant accelerator. The significant changes to the accelerator design that occurred in 1953 will be addressed in a following chapter.





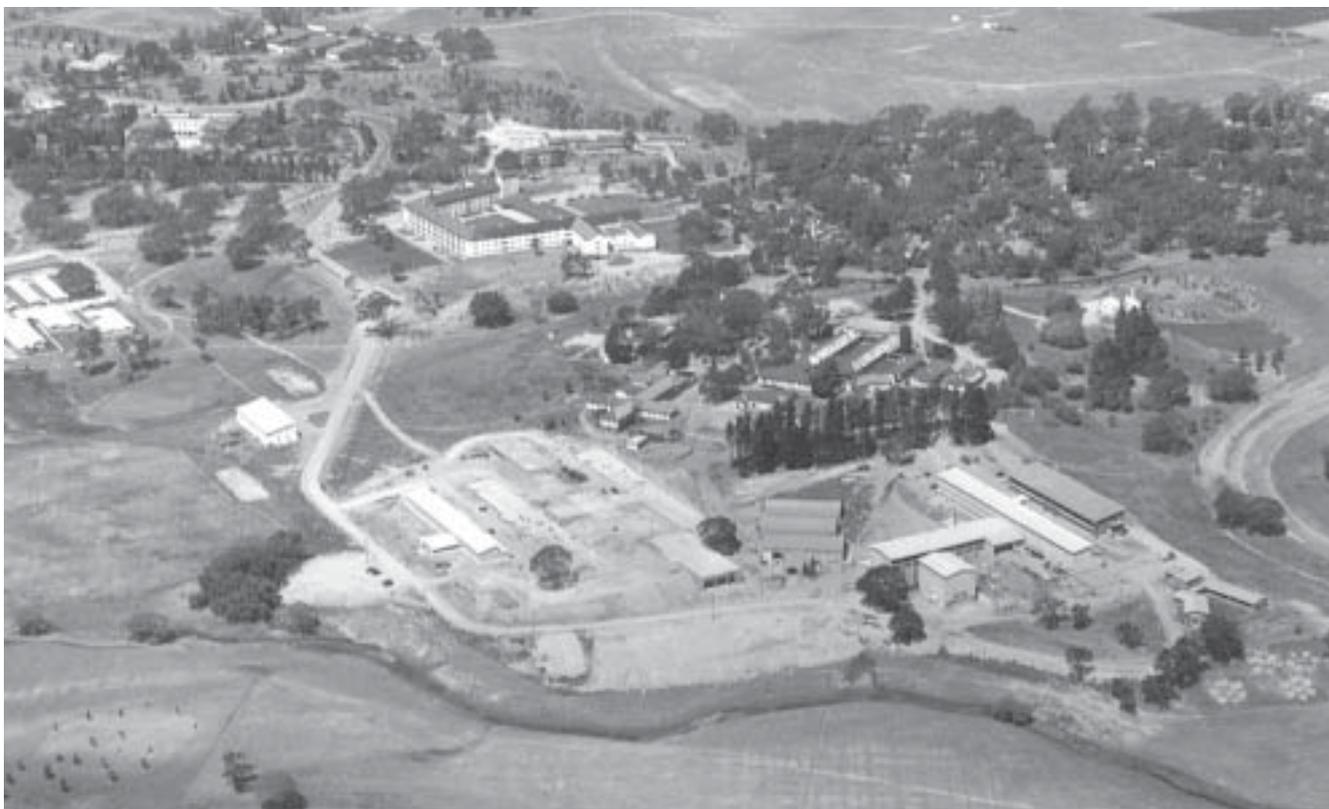
An aerial view of the campus and rural environs (April 26 1953).



An aerial view with the temporary Administration buildings in the foreground. The Old Hospital Buildings/Acton Government Offices complex is at top centre. To the right of those buildings, the temporary store/workshop can be seen adjacent to the row of pine trees (June 8 1953).



A later aerial view that should evoke memories for pioneers of the School. Lennox Crossing is at the lower left and the original Commonwealth Avenue bridge spans the River Molonglo at the lower right. The Acton Sports Ground, scene of many cricketing triumphs, is at the centre of the photograph (November 15 1954).



An aerial view with RSPHysS in the foreground. Preliminary preparations of the site for JCSMR are evident. The two parallel Nissen (or Romney) huts between RSPHysS and the JCSMR site were used by the Library for storage of much of the extensive collection that had been moved from Melbourne (November 15 1954).

The pioneers of the fifties endured other problems besides building delays. Canberra's utilities were not always equal to the demands of continuously operated research equipment. Power interruptions were frequent - practically every time it rained due to "dust on the insulators", and often the water quality, according to a letter-writer in the *Canberra Times*, was better suited to the top-dressing of lawns than to more conventional use. Both problems continued well into the sixties, as did the infamous "Canberra Wog", a prevalent debilitating complaint causing either or both diarrhoea and vomiting, that was attributed to the muddy waters also.

It became a matter of routine for students in Nuclear Physics to head off for the laboratory whenever it started to rain out of working hours to ensure that no damage was done to equipment by power interruptions.

Cooling coils on the diffusion pumps of vacuum systems soon became clogged by suspended material in the water, sometimes causing supply hoses to burst. As a preventative, the coils were reverse flushed periodically. Such diligence was invariably rewarded by the thick chocolate-brown slurry that emerged. A technician in Nuclear Physics made several valiant attempts to design an effective filter. An inspection of trapped material after one test over a weekend period revealed strands of green weed, gravel ranging in size from grit to small pebbles and an earthworm!

1 Information about the Griffin Plan was taken from "The History of the Site Plan 1912-71", prepared by the Property and Plans Section in 1973. The document has no identification apart from the stamped number P&P 74/13 on the front cover.

2 Cockburn, S. and Ellyard D., "Oliphant - the Life and Times of Sir Mark Oliphant" Axiom Books (Adelaide) 1981. This excellent biography of Oliphant is recommended as companion reading to the present history. Though it has a different objective, there are obviously many areas of overlap, invariably well-presented and with useful background material. The biography proved to be an extremely useful reference source for the current work, for which document research was limited by the constraints of time and the pressures of other responsibilities.

3 The nomenclature for the early appointments finally became Research Fellow, although Junior Fellow was sometimes used initially. Somewhat arbitrary salaries were recommended, depending on experience and ability. No distinction has

been made here between Junior Fellow and Research Fellow.

4 Cornick's movements have been reconstructed from various fragmentary recollections of fellow ANU pioneers. Unfortunately, his file was destroyed during a period when it was the policy to do so once the subject of the file attained the age of 75. Exception was made for those achieving "notoriety". The definition of notoriety was rather pedestrian - inclusion in *Who's Who* for example, otherwise Cornick's file may well have survived! It has been suggested that Cornick accompanied Oliphant when the Advisory Committee came to Canberra in 1948. Confirmatory evidence has not been forthcoming.

The pressure on archival space from personnel files would be eased dramatically if all superannuation records were removed from them. For the early appointments, though perhaps less so for later ones, such matters constitute the greater part of the material held.

5 Oliphant, M.L., *Nature* 165(1950) 466.

6 Many of the dates given for announcements of staff appointments and building progress correspond to those of issues of the "University News". Actual dates may well have been a few weeks earlier, although in some cases, the News anticipated over-optimistically progress expected by the time of issue (excavations for the Cockcroft Building for example).

Nonetheless, the News provides excellent records of the early days and contains delightful insights into lifestyle and conditions in Canberra.

In March 1950 for example; "There was an unusually wet spell, 289 points falling between 4th February and 8th February, to the satisfaction of farmers; on the following few days mushroom gathering was a popular (and rewarding) early morning occupation".

7 Regrettably, it has only been in recent years (from 1981) that staff listings in annual reports of the School have included all of School Services, in particular staff of the various workshops. It has proven extremely difficult, if not impossible, to establish the total School general staff complement in years prior to them.