Lord and Lady Todd of Trumpington in the Governor-General's car after arriving at Canberra airport yesterday.

'BENEFITS AND DANGER' AHEAD IN GENETICS

Foreseeable developments in the science of genetics had a potential for good or evil comparable with that of nuclear energy, Lord Todd of Trumpington said in Canberra yesterday.

Lord Todd, professor of organic chemistry at the University of Cambridge, England, won a Nobel Prize in 1957 for research of basic importance in the development of genetics at the chemical level.

Tomorrow he will officially open the new Research School of Chemistry at the Australian National University and receive an honorary doctorate of science at the installation ceremony for the new Chancellor of the ANU, Dr H. C. Coombs.

He predicted yesterday that within the next 10 to 15 years it would be possible to make specific alterations to genic materials by chemical means.

The benefits that could result included ability to cure genetically controlled mental deficiencies and physical disorders.

The dangers included the possibility of modifying people to make them behave in a particular way.

"If you could control genic material, I suppose you could produce a coalminer who would have no object in life but mining coal", he said.

Scientists had already shown that very simple cell systems could be modified, and big advances could be expected in 10 to 15 years.

Dealing with misery

"Whether you care to use this knowledge for good in dealing with misery caused by congenital defects or to further undesirable ends I'm afraid is going to be man's choice", Lord Todd said.

" . . . It is for man's decision whether he makes an appalling misuse of these discoveries in genetics. He could — I am hopeful he won't".

He predicted that in the "medium future" chemical modification of genetic material would be used mainly for stock improvement and modification. It would be a quicker process than the modification by breeding that was done now.

Molecular roulette finds insect killer

By LENNARD BICKEL

Organic chemists working at a new chemistry research centre in Canberra have achieved the biggest advance in pest control since the discovery of DDT.

By playing molecular roulette they have perfected the synthesis of an insect hormone which will interfere with the normal life cycle and prevent reproduction.

As a result of their work selective hormone compounds may be used in the near future to kill mosquitoes and bush flies.

It also means that insects will not be able to develop resistance to the hormone as they can against pesticides and insecticides.

The simplicity of synthesising the hormone has opened the way to producing large quantities for commercial use. The testing will be carried out by an American firm which will make its results freely available in Australia.

The dean of the Australian National University's Research School of Chemistry, Professor A. J. Birch, a world pioneer in hormone synthesis, led the team that made the breakthrough.

The work means insect hormones may soon be tailormade for specific pests and leape untouched the beneficial life forms that are often wiped out by the normal residues of poisonous pesticides.

The breakthrough has been in the synthesis of an insect juvenile hormone called juvabione, which controls the pupation stages of insects of the bug family.

Professor Birch said yesterday the hormone was not poisonous but stopped physiological processes in the insects.

"If the female insect absorbs enough of this synthetic hormone, all the eggs she lays will be sterile," he said.

He said the work complemented studies by the CSIRO. The object was to remove the threat of side-poisoning in the control of unwanted pests.

THROUGH SKIN

Professor Birch said that the character of the synthesised hormone had overcome previous application difficulties.

Some hormone compounds were only useful when injected into insects.

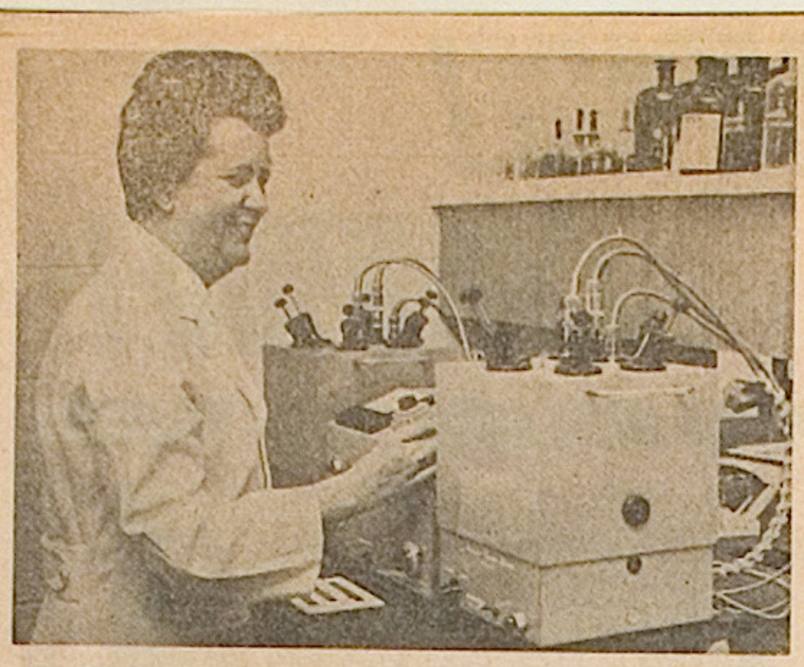
"If you can catch a bug you might as well squash it. With this compound capable of being easily and economically produced, and which is absorbed through the skins of insects, there is no such problem," he said.

He said his group would go on working to seek out the molecule structure changes needed for control of selected pests.

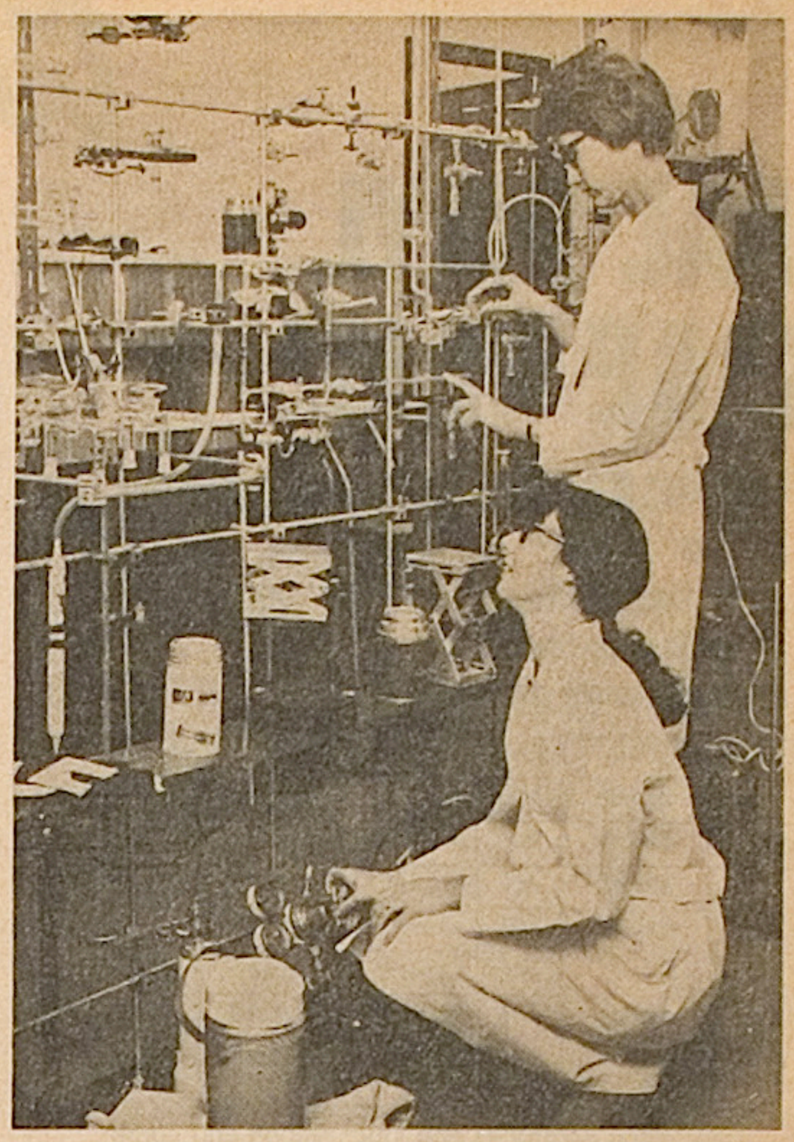
"Work in this field is only just beginning," he said.

"It offers us the biggest potential breakthrough in pest control since DDT. It has come out of an explosion in this science in recent years."

Professor Birch was the first man to achieve the synthesis of a male hormone in 1949.



Miss Brenda Stevenson, a microanalyst, takes a reading on the vapour pressure osmometer used for molecular weight determination in the organic chemistry laboratory of the new Research School of Chemistry, Australian National University.



Ph.D. research scholars Mrs Pat Marzilli (lower) and Miss Inge Olsen prepare an experiment in the new Research School of Chemistry.

Women's place is in the lab

CHEMISTRY, to Mrs Pat Marzilli, is a lot like cooking. "You mix things together, stir them up, then wait and see what happens".

A PhD research scholar, Mrs Marzilli is among the women scientists, analysts, laboratory technicians and assistants, secretaries and librarians at the Australian National University's newest building — the Research School of Chemistry.

Tomorrow at 3pm the school, built at a cost of $2.798 million, will be officially opened by Lord Todd of Trumpington, Professor of Organic Chemistry at the University of Cambridge and Chancellor of Strathclyde University.

Covering 120,000 square feet, the school consists of a core of service laboratories, especially those needing temperature control, with an outer ring of laboratories and offices.

In the core are laboratories for analysis, for work at low temperature, preparation of toxic materials, radioactive synthetics and measurement, a fireproof laboratory and others containing spectrometers and equipment for microbiological chemistry.

Much of the work of the organic section is concerned with compounds of biological importance, or with Australian natural products. One region of study includes that of sex hormones and insect hormones.

Research in theoretical and physical chemistry is concerned with the deep chemical problems of the forces holding atoms together in molecules and molecules in crystals.

"It's a beautifully-designed building with a touch of luxury that isn't always found in functional chemistry labs", said Miss Brando Stevenson, an analyst and Fellow in charge of the microanalytical unit. "We moved into the school in August and it was November before we were really settled but even now I seem to spend half my time chasing equipment".

Miss Stevenson, who took her Master's degree in Chemistry at the University of NSW, came to the ANU in August after more than 14 years as a microanalyst at the University of Sydney.

"Most of the work involves analysing chemicals for carbon, hydrogen, nitrogen and metals, and we are lucky to have really modern specialised equipment for the job.

"Lab technicians take on quite a bit of the work and it is a particularly good job for a girl. Girls who like messing about with chemicals and instruments love the work — it is interesting, quite different, and good for those who like variety without wanting too much responsibility".

In the inorganic chemistry rooms on the first floor, Pat Marzilli and Danish research scholar Inge Olsen worked side-by-side on a bench scattered with glass tubes, chemical jars and graph charts.

Pat, originally from New Jersey, and Inge moved to the Research School last year from the biological inorganic chemistry unit in the John Curtin School of Medical Research.

"It's rather fun being the only girls in the section and we are certainly treated like equals", said Pat. "In fact, sometimes I think they take the equality bit too far . . . such as letting us lug our own gas cylinders around".

Both are Ph.D. research scholars. Pat is concerned with the inorganic chemistry of metal complexes and Inge's studies concentrate on cobalt complexes.

Inge, who came to Australia two and a half years ago after gaining her Master's degree at the University of Copenhagen, will marry in two weeks' time a South Australian Ph.D. scholar in physics.

The couple met at the ANU, and after completing their studies at the end of the year hope to globe-trot before settling down. A graduate of Brown University, Rhode Island, Pat will move to Chicago with her husband later this year.

"Chemistry is a tremendous field for a girl and most seem to be attracted to it from the start when they are at high school. The pay is good, the conditions are good and the opportunities almost endless, because there are so many different ways you can use your knowledge".

Even secretaries in the chemistry school are well versed on the intricacies of molecular systems, spectrographs, electron spin resonance and ultra violet radiation.

According to Miss Joyce Dickson, secretary to Professor D. P. Craig, who is Foundation Professor of Physics and Theoretical Chemistry, "It is a language all of its own and a girl who has not worked with it before would have quite a hard time.

"I am used to it now, of course, and I much prefer to work in an academic atmosphere, as it is here, than in a business or industrial office. At first all the formulas and figures are a bit confusing but you get used to it".

Hormone war on insects predicted

The dean of the Research School of Chemistry at the Australian National University, Professor A. J. Birch, predicted yesterday that mosquitoes and the bushfly would be eradicated by hormone compounds used as insecticides.

He said work in the area of insect hormones was just beginning, and it offered the biggest potential breakthrough in the treatment of insect pests since DDT.

Scientists in the research school have devised a process for synthesising a hormone that could prove useful in controlling some insects.

Development of the process was announced in an ANU statement issued yesterday.

Not dangerous to other life

"Professor Birch said he could not name a date when the hormone compounds would be used to eradicate such common pests as mosquitoes and the bushfly", the statement said, "but he suggested that the time is not far off".

The statement said the use of hormones to control insect populations had several advantages over chemicals, such as DDT.

Hormone compounds worked selectively so that only certain insects were affected and they were not poisonous and not dangerous to other life such as birds and plants.

Insects did not develop an immunity to them as they did to poisons, because the hormones were an integral part of their own life cycles.

If maintenance of a number of insects was desirable, the population could be controlled rather than eradicated.

The hormone synthesised by the ANU scientists was juvabione, a hormone for "the bug family".

By making slight structural alterations in the compound, chemists could develop other synthetic hormones which might be effective for other groups of insects.

The research school would not be concerned with the testing of the synthesised compounds. The ANU was collaborating with an American firm which would do the testing and the results would be freely available in Australia.

PICTURED : Above, the new research school of chemistry building.

New chancellor and chemistry building

Tomorrow the Australian National University will get a new chancellor and a new research school of chemistry building, costing over $2 million.

DR. H. C. COOMBS . . . the former governor of the Reserve Bank who will tomorrow be installed as chancellor of the ANU.

Dr H. C. Coombs, the former governor of the Reserve Bank of Australia, will be installed as chancellor in the Canberra Theatre at 10am.

Replacing the late Lord Florey of Adelaide, Dr. Coombs will add the distinction of chancellorship to his other notable positions as chairman of the Office of Aboriginal Affairs and chairman of the Performing Arts Council.

After becoming chancellor, Dr Coombs will confer 17 higher-level degrees, including honorary degrees on three eminent Australians.

Sidney Nolan will receive an honorary doctor of laws degree for his services to Australian art.

The physicist Sir Mark Oliphant and the 1957 Noble Prize winner for chemistry, Lord Todd, will both receive honorary doctor of science degrees.

Lord Todd, professor of organic chemistry at Cambridge University, will probably be breaking some kind of record because tomorrow's will be the 19th honorary degree awarded to him from universities around the world.

In the afternoon, Lord Todd will officially open the new research school of chemistry building, a research school that will be conducted on a different basis from most others.

The school will have no formal departments, since emphasis will be placed on an exchange of ideas and an integration of functions.

Dr Coombs will apparently be kept extremely busy at 62 years of age, although retired as governor of the Reserve Bank and chairman of its board.

Born in Kalamunda, Western Australia, the eldest of a station-master's five children, he taught school in Perth until 1931, when he travelled to London to take a philosophy degree with a thesis on central banking problems.

In 1935, he joined the Commonwealth Bank as assistant economist and in 1939 was transferred to the Commonwealth Treasury.

During World War II, Dr Coombs served as the director of rationing and director-general of post-war reconstruction.

He led several Australian delegations to world economic conferences and in 1949, was an advisor at the British Commonwealth Finance Conference in London.

In 1965, the London Financial Times named him as the foremost foreign banker of the year.

Besides being a banker and economist of high distinction, Dr Coombs has also been interested in the fine arts, the contribution that universities are making and Australia's social problems.

His long association with the Australian National University is perpetuated by the H. C. Coombs Building, which houses the research schools of social sciences and Pacific studies.

Professor J. W. Cornforth

John W. Cornforth was born in Sydney, Australia and was educated at Sydney High School, and at the University of Sydney where he was a contemporary of Sir Ronald Nyholm. He and his future wife, R. H. Harradence, went to Oxford in 1939 and worked during the war in Sir Robert Robinson's laboratory, the chemistry of penicillin being one of the principal topics of research. In 1946 he joined the scientific staff of the Medical Research Council and held this position until 1962, when he and Professor G.

Popják left the Council's service to direct jointly the Shell Research Milstead Laboratory of Chemical Enzymology at Sittingbourne. He is an associate professor in the School of Molecular Sciences of the University of Warwick.

Professor Cornforth's research work has included contributions to heterocyclic chemistry; the synthesis of natural products including steroids, *N*-acetylneuraminic acid and abscisic acid; the biosynthesis of cholesterol and other polyisoprenoids; and the stereochemistry of enzymic reactions. He is a holder of The Chemical Society's Corday-Morgan and Flintoff Medals and, jointly with Professor Popják, has received the Biochemical Society's Ciba Medal and the Stouffer Prize. He was elected to the Royal Society in 1953.

John Harper

Sid Lind.

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OPENING 6 SEPTEMBER 1968

RESEARCH SCHOOL OF CHEMISTRY

The Building.

The main building contains three floors and a basement with some of the major plant. Attached to the front of the building is the library-lecture theatre block (two floors) and to the rear of the building the workshop area (one floor).

The main building contains a core with a number of common service laboratories, particularly those requiring temperature and humidity control. The peripheral laboratories on each floor, are integrated in terms of subjects (ground floor: Physical and Theoretical; second floor: Inorganic; third floor: Organic and Microbial Chemistry) and relate as far as possible to the core laboratories on the same floor. Few people work full-time in core laboratories only.

The building has few internal bearing walls, and could be completely reconstructed internally if necessary. Such flexibility is highly desirable in a science building. The building is cheap by European and U.S. standards (less than $20 per sq. ft including all fixed furniture), because of its method of construction. The use of caste concrete units, has for example, almost eliminated the need for plaster, and the construction of internal walls from concrete bricks gives not only flexibility but cheapness. The insulating double windows are a feature which assists temperature stability. The external louvres and roof overhang are in a sense purely functional in the same connection, but are at the same time fine architectural features.

Great care has been given to all aspects of technical design in relation to function and workers are willing to explain such features.

Safety.

Visitors should note that although every care has been taken to remove or mark sources of danger, chemicals are dangerous and switches and the high-voltage instruments they control can be dangerous. Visitors are particularly requested therefore not to touch bottles, taps or switches, or any equipment.

The following parts of the building are available for inspection.

Workshop.

This workshop (rear of School) is open for inspection, and a glass-working demonstration will be in progress from 4.30 to 5.45 p.m.

Ground Floor. (Physical and Theoretical).

Room 5.

Electron-spin resonance. This instrument measures the energy required to change the direction of electron spins. Among many applications it is used to detect short-lived chemical species produced by chemical reaction or by irradiation.

Room 64.

Nuclear Magnetic Resonance. This instrument measures properties of the nuclear spins for a variety of nuclear types. Because these properties are modified by chemical environment they are particularly valuable in studying details of molecular structures.

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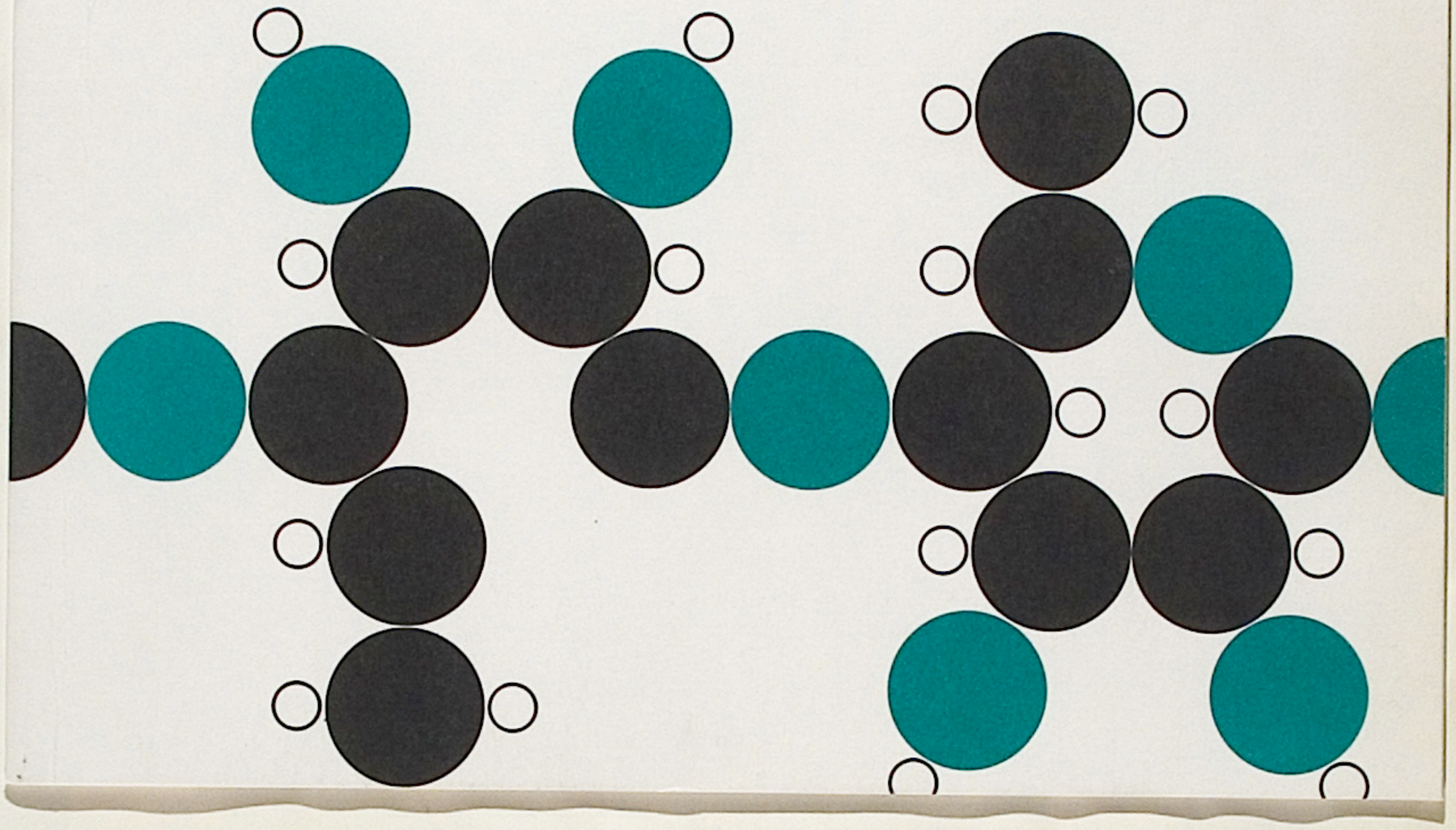
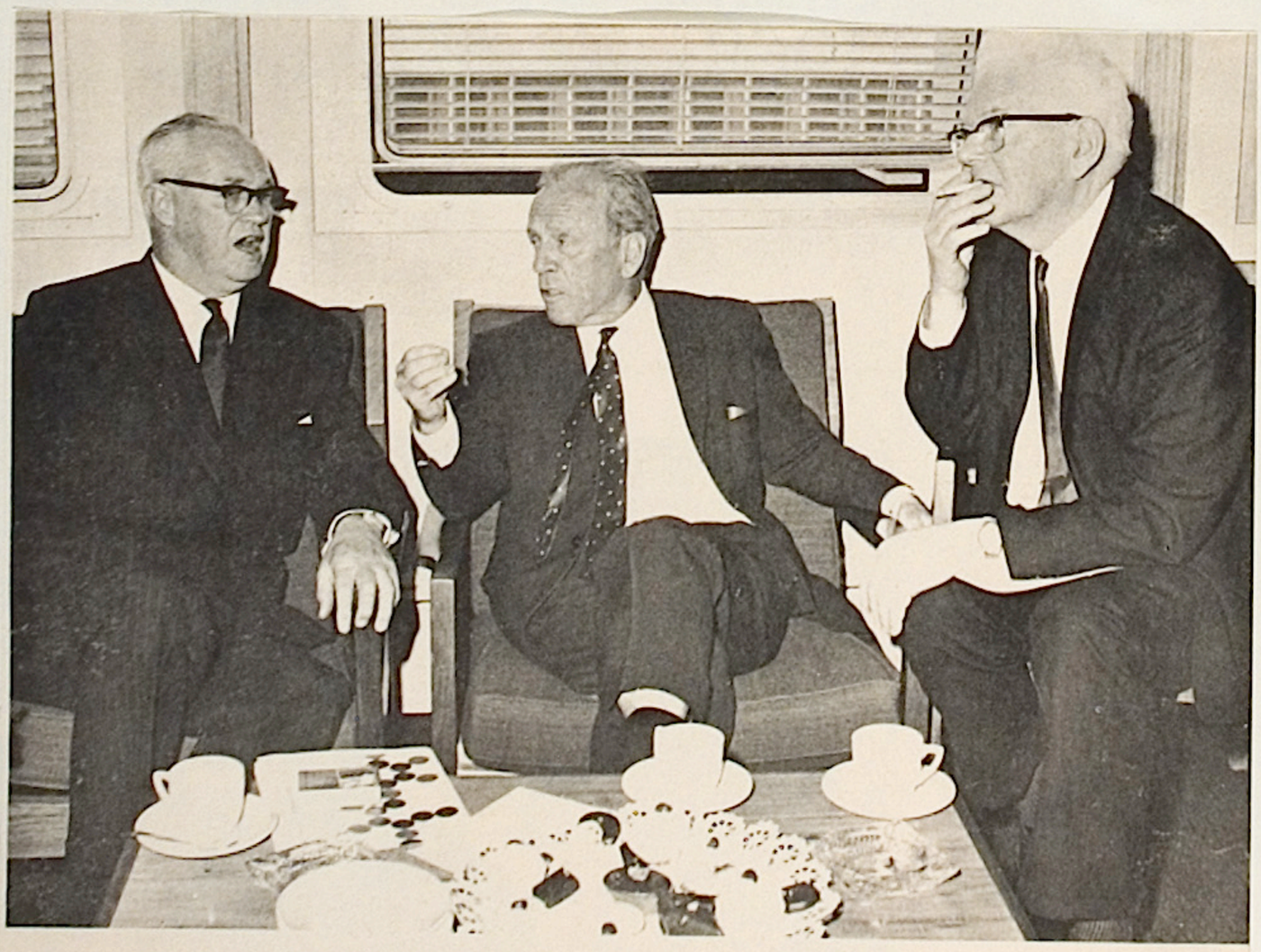
AUSTRALIAN NATIONAL UNIVERSITY

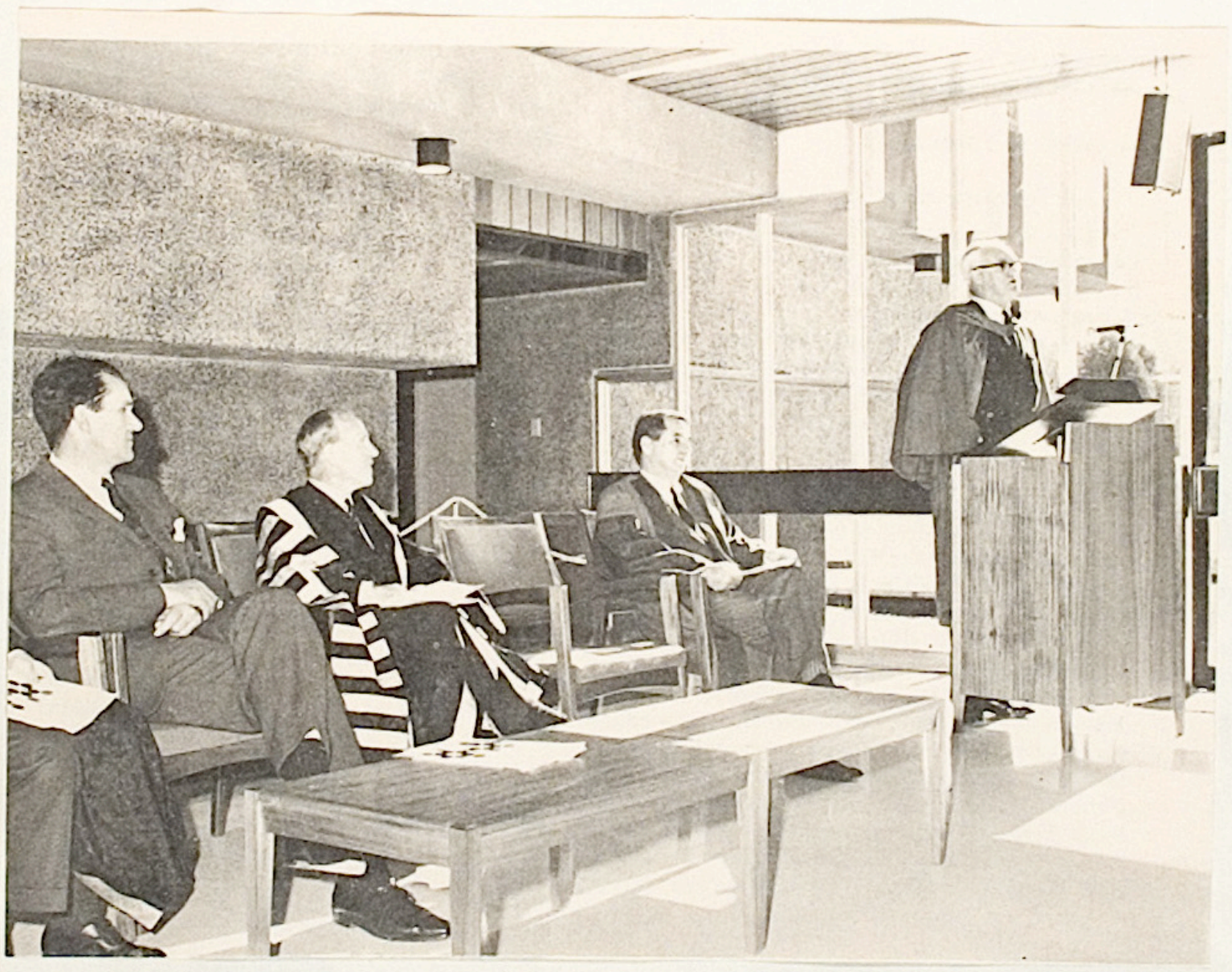
Institute of Advanced Studies Research School of Chemistry





After the ceremony Lord Todd (left) joined the Chancellor and Sir Mark Oliphant for tea

Professor D. P. Craig (left) and Professor J. A. Allen, University of Newcastle



6 Sept. 1968.

THE RESEARCH SCHOOL OF CHEMISTRY

OFFICIAL OPENING BY LORD TODD OF TRUMPINGTON

3 p.m.

Friday, 6 September 1968

NOTES ON THE CEREMONY

3 p.m. Procession from robing room to front foyer: Professor D.P. Craig, Professor A.J. Birch, the Vice-Chancellor Sir John Crawford, Lord Todd, the Minister for Education and Science Mr Malcolm Fraser, the Chancellor Dr H.C. Coombs.
The Chancellor will open the ceremony and call upon Professor Birch, Dean of the School, to speak.
Following Professor Birch's remarks a short address will be given by the Minister for Education and Science.
Finally Lord Todd will declare the Building open.

3.40 p.m. - 6.00 p.m. Afternoon tea, after which the Building will be open to inspection by the public.

NOTES ON SOME OF THOSE PRESENT:

Lord Todd of Trumpington, F.R.S.: Professor of Organic Chemistry in the University of Cambridge and Master of Christ's College, Cambridge. Chancellor of Strathclyde University. Winner of the Nobel Prize 1957 for work on the basic chemical structure of nucleic acids. On the morning of 6 September the newly-installed Chancellor Dr H.C. Coombs will confer the Honorary Degree of Doctor of Science on Lord Todd.

Professor A.J. Birch, F.R.S.: First Dean of the Research School of Chemistry, and Foundation Professor of Organic Chemistry. Previously Professor of Organic Chemistry, University of Manchester. Hormonal research carried out by Professor Birch after the war culminated in 1948 in the first total synthesis of a male sex hormone by a process now used extensively in industry in the production of oral contraceptives and in related fields. He is still actively engaged in the field of hormonal research, and is currently involved with a project of hormonal control of insect pests.

Professor D.P. Craig, F.R.S.: Foundation Professor of Physical and Theoretical Chemistry. Previously Professor of Theoretical Chemistry at University College, London. He developed methods which are now generally accepted for the interpretation of the spectra of crystals, and which have helped in the understanding of the forces holding together the molecules in solids. His current work is also in this area. Elected to Fellowship of the Royal Society March 1968.

THE BUILDING

Architects: Eggleston Macdonald & Secomb (who also designed the Physics, Chemistry and Geology Buildings, and the Psychology Building at present under construction).

Builders: Civil and Civic Pty. Ltd.

Total Cost of building works: $2,798,000.

Total area of building including workshops, laboratories, lecture theatre and service areas: 120,000 square feet.

THE SCHOOL

The Research School of Chemistry is the fifth of the six Research Schools of the Institute of Advanced Studies (the most recent, the Research School of Biological Sciences, is working in temporary quarters). The School is organised on an integrated basis, with a minimum of emphasis on traditional departments. Its policy is to pursue a wide range of chemical studies within the most flexible possible structure, in order to promote cross-fertilisation of ideas. In setting up the School it was intended to provide a "centre of excellence", equipped to the most modern standards. Research work has been planned around the physical facilities and the availability of appropriate staff to utilise them. Main areas of research are inorganic chemistry, physical and theoretical chemistry and organic chemistry.
Present academic staff number twenty-eight, and sixteen Research Scholars are enrolled. The facilities of the building will allow for considerable expansion of staff.

THE AUSTRALIAN NATIONAL UNIVERSITY

OPENING OF RESEARCH SCHOOL OF CHEMISTRY

6 September 1968

ADDRESS BY THE RIGHT HONOURABLE THE LORD TODD

It is a privilege and an honour to be here today for the opening of these magnificent new laboratories of the National University's School of Chemistry. To me it is a particular pleasure to be called uppn to open them - and that for a variety of reasons. In the first place I have a proprietorial interest in them as a graduate of the University, albeit one who didn't do any work to get his degree. Secondly, of course, Professor Birch is a friend of long standing and one who a good many years ago was my colleague in Cambridge where he worked for two or three years as a Royal Society Research Fellow. Thirdly it marks a major step in the University's development and one to which I have long looked forward. It really is astonishing how the University, and indeed Canberra too, has grown over the years. When I first visited Canberra close on twenty years ago it seemed to consist largely of small clumps of buildings separated from one another by substantial stretches of bush; the beautiful lake which now adorns it did not exist and, truth to tell, I regarded its realisation as something which might never happen. The National University was itself embryonic and showed much more in the way of mud than buildings. Since then there has been a great and continuing transformation; in the University we have seen the rise of great schools of medical and physical research. But to me the lack of a corresponding chemical school was always a source of concern, and it was so for the following reasons.

Chemistry can legitimately be regarded as the centre-piece of natural science. At the one extreme it has close affinities with physics and at the other it reaches deep into the realms of biology and medicine, progress in which is inextricably linked with progress in chemistry. In the large area between these extremes it stands as the backbone of industrial progress - not just for the chemical industry proper, but over the whole span of industries where chemistry and the products of the chemical industry play a vital part. In these days the lay public is, through press and radio, constantly reminded of the importance of physics (largely because of nuclear energy developments) and of the so-called molecular biology (D.N.A. and genetics); chemistry is much less in evidence and hence gets less attention than it deserves from the public - and not infrequently from Government also. Perhaps this is because its basic concepts seem rather abstruse and remote from everyday life and experience or possibly because its successes are not always spectacular in the way that an atomic explosion is spectacular. Yet a glance at the world around us today should surely convince us of its importance - new fuels, fibres, dyes, drugs, fertilisers, agricultural and veterinary chemicals, building materials, plastics and a host of other things stem directly from chemistry and from the great industries based upon it. Here in Australia it is my belief that chemistry is a science of tremendous importance and one which should be carefully nurtured. For make no mistake, no country can be strong industrially without a strong chemical industry, and such is the intimate connection that exists between chemical science and chemical industry that the latter will not develop real strength without strength in pure chemical research. This can be clearly seen from an examination of the state of affairs in any of the highly industrialised nations.

What I have said could be regarded as a general plea for chemistry in Australia. But it is particularly important to have it in strength here in this capital city where in addition to the other research schools of the University we have major divisions of CSIRO such as those dealing with entomology and plant industry. The opportunity is surely here for a major venture in co-operative action among these various organisations to tackle the many problems - and they are major problems involving more than one discipline - which face a young and growing nation such as yours. Such co-operation has always been my hope and my dream and I believe that given goodwill it can now be realised. In Professors Birch and Craig and their colleagues you have chemists of ability and imagination. In their hands this School of Chemistry can and will grow and flourish and in so doing speed on the country's development and provide not only training for young men and women of Australia in what to me is the queen of the sciences, but will provide the fertile soil in which their genius may grow and flourish. It is for this reason that I now have the greatest pleasure in declaring these laboratories open and in wishing good fortune and successful research to all who may work in them.

The Australian National University

Research School of Chemistry

The new Research School of Chemistry within the Institute of Advanced Studies of the Australian National University was formally opened on 6 September, 1968, by Lord Todd, F.R.S., in the presence of the Minister for Education and Science, the Hon. Malcolm Fraser, and the Chancellor of the University, Dr. H. C. Coombs.

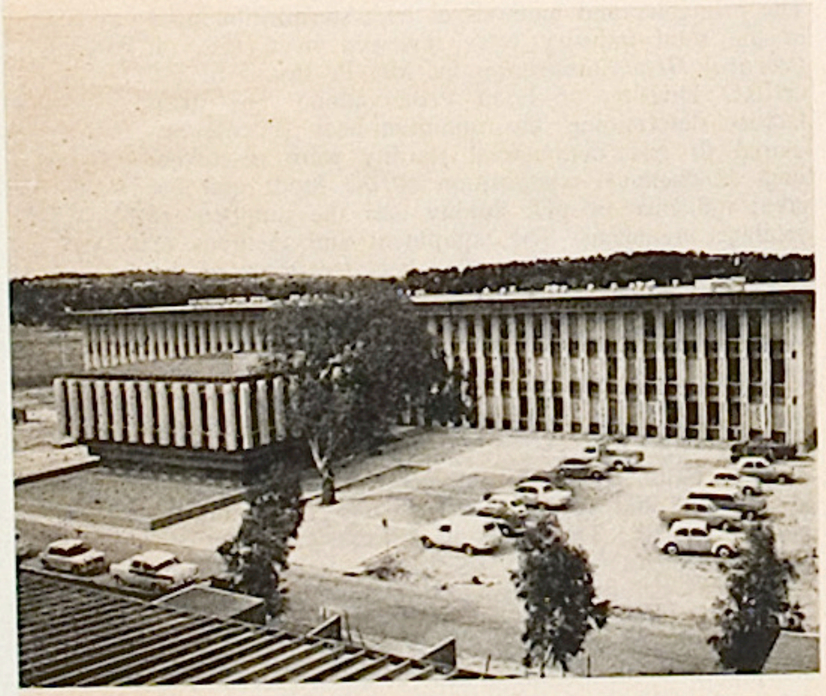
In this article the Dean of the School, Professor A. J. Birch, F.R.S., *Fellow*, describes the facilities available and outlines some of the research areas in which the School is already playing an active role.

The School was planned in discussions going back to 1961 between representatives of the National University, the Universities Commission and three Advisers: Professor A. J. Birch, Professor D. P. Craig and Professor Sir Ronald Nyholm. The building plans were drawn up in London in discussions between the Advisers and Messrs. R. MacDonald and W. Batt, the representatives of the architects (MacDonald, Eggleston and Secomb). Commenced in 1965, the building was completed by the builders (Civil and Civic) exactly on schedule in August, 1967. It comprises about 120,000 sq.ft., and with fixed furnishings cost $2,794,000.

The building is technically very good and architecturally most attractive. It was built with the greatest flexibility in mind, and also with building features which resulted in cheap building but a luxurious appearance. It consists of a core containing service laboratories (analysis, fireproof, microbiological chemistry, radiotracer preparation and measurement, refrigerated, hydrogenation, toxic preparations, thin-layer chromatography, instrumental, etcetera) including those which require temperature control. This control can readily be extended to any required laboratories through a locally-controlled mixture of hot and cold air from central sources. The peripheral laboratories and offices are the main working ones and all have double windows with enclosed venetian blinds for heat and light control. All internal walls are built of concrete bricks and can be removed or altered very rapidly and cheaply. Most ceilings are directly-cast concrete, some painted and some in exposed aggregate; they are much cheaper than plastered ceilings and more attractive. The floors are vinyl tiles. A large workshop area contains a drawing section, instrument repair and electronics sections, paint shop and metalworking, woodworking and glass-blowing shops, with appropriate expert technical assistance. An external section of the buildings includes a high pressure laboratory, a solvent store and liquid air and helium generators. A large common room is used for tea and coffee service, for social events and for Faculty and other large meetings. A library and lecture theatre block is attached to the main building. Both are very attractive and comfortable and the library contains the majority of the University chemical periodicals; it does not lend periodicals but provides a generous photocopying service.

Prof. A. J. Birch

Prof. D. P. Craig



A general view of the Research School of Chemistry building, the Lecture Theatre in the foreground.

Research School of Chemistry Professor John W. Cornforth, F.R.S., Associate Professor in the School of Molecular Sciences, University of Warwick, and Co-director of Milstead Laboratory of Chemical Enzymology, is spending three months in Australia as a visitor to the Research School, CSIRO and the Academy of Science. Professor Cornforth is a graduate of the University of Sydney. He went to Oxford in 1939 and in 1946 joined the scientific staff of the Medical Research Council, where he stayed until going to the Milstead Laboratory in 1962. Professor Cornforth's research work has included contributions to heterocyclic chemistry, the synthesis of natural products, the biosynthesis of cholesterol and other polyisoprenoids, and the stereochemistry of enzymic reactions. Professor Cornforth is accompanied on his visit to Australia by his wife, Dr R. H. Cornforth.

The School is an integrated one, the head being a Dean who holds office for three years and is assisted by a Faculty and a Faculty Board. The Faculty contains all academics, whether temporary or permanent, and the Board contains all Professors and all heads of Sections who have direct interest in finances, appointments or promotions, together with an elected representative of Faculty. The Dean is also assisted by a Laboratory Manager (Mr. J. Harper) and a Graduate Assistant (Mr. J. Sharp).

The School at present has three Sections—Inorganic, Organic, and Physical and Theoretical—but its structure makes the development of further Sections very likely in the near future. Nuclei of further Sections exist at present, for example, X-ray crystallography (Dr. G. B. Robertson) and microbiological chemistry. Only a decision of the Faculty Board is necessary in setting up a Section.

Excellent Facilities Available

Equipment is at the best world standards; students and staff have direct access to routine instruments such as infrared and ultraviolet spectrometers situated in clean areas immediately adjacent to research laboratories. Major items of equipment, such as 100 MHz nuclear magnetic resonance (with a PDP 8s computer), e.p.r. and mass spectrometers, are partly individual research tools (Dr. R. Bramley and Dr. J. MacLeod) and are partly for routine use, technical officers providing a service. A large analytical laboratory provides a wide range of organic and inorganic analyses, molecular weights and spectrometric analyses. The usual separation and purification equipment—high efficiency distillation, thin-layer chromatography, gas–liquid chromatography and zone-refining—is available at both analytical and preparative levels.

The main criterion applied to work being carried out in the School is that it should be primarily good

One of the School's well-equipped laboratories.

Lord Todd, F.R.S., delivering the inaugural address. Seated is Professor A. J. Birch, F.R.S.

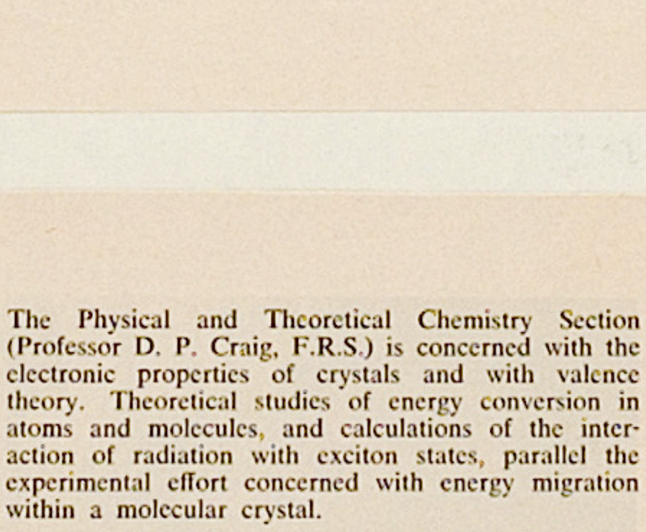
chemistry, but in addition other considerations apply: the field may not be adequately covered elsewhere in Australia for accidental reasons, or because it is too long-term or too difficult for the normal Ph.D. student organization of the State universities, or it may have particular long-term Australian relevance. In the last area are a number of aspects of biologically active compounds, since applied biology is clearly of continuing interest in this country. Particular examples are some aspects of termite chemistry (in collaboration with Dr. B. Moore of the CSIRO), chemical aspects of a sheep disease which is probably fungal in origin, the total synthesis of some insect juvenile hormones and some steroid hormones, and structural investigations of a number of natural antifungal agents (Mr. R. W. Rickards). We feel some responsibility also for investigations of natural materials unique to Australia, including some essential oils and the resins of the Xanthorrhoea ('grass-trees') which are chemically unusual. Some investigations of plant products also have an ultimate objective in assisting the tracing of evolutionary relationships by examining alterations in biosynthetic routes. To back up all of this is a considerable effort in the evolution of new synthetic methods (Professor A. J. Birch, F.R.S.).

Inorganic and Physical Chemistry

Almost any inorganic chemistry is likely to be relevant in Australia in the next few decades, and a strong Inorganic Section is investigating various fundamental extensions of 'classical' coordination chemistry (Dr. A. Sargeson and Dr. D. A. Buckingham), leading to such unlikely results as a new peptide synthesis, and organometallic chemistry (Dr. M. A. Bennett). The last to some extent interacts with the organic section on the evolution of new synthetic organic processes.

The Physical and Theoretical Chemistry Section (Professor D. P. Craig, F.R.S.) is concerned with the electronic properties of crystals and with valence theory. Theoretical studies of energy conversion in atoms and molecules, and calculations of the interaction of radiation with exciton states, parallel the experimental effort concerned with energy migration within a molecular crystal.

The School at present has 28 Staff (including Research and Postdoctoral Fellows) and 15 Ph.D. students. The numbers projected by the end of 1972 are about 55 staff and 45 Ph.D. students.



The E.P.R. Spectrometer

The library and a number of the major instrumental facilities are available to staff and research students of the School of General Studies and to the John Curtin School of Medical Research, and some undergraduate teaching is carried out by the staff under the control of the School of General Studies. The main teaching effort, however, is in frequent seminars and in postgraduate courses, extensions of which are currently planned.


PRESIDENT.
SECRETARY.


PRESIDENT.
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1969

1969

1970 PHYSICAL & THEORETICAL SUMMER SCHOOL

Summer School of Theoretical Chemistry

Almost 60 scientists from universities in Australia and New Zealand and divisions of CSIRO took part in a highly successful Summer School of Theoretical Chemistry, held in the Research School of Chemistry from 2-13 February.

While theoretical chemistry is taught in most Australian universities, research in the subject is confined to a few, including the Australian National University. In response to a number of enquiries members of the Research School became interested in bringing together members of academic staff and research workers under conditions where informal discussions could be arranged, as well as lectures by experts in various fields. The resulting program was an intensive one, with a morning lecture, an afternoon practice session in which participants worked at problems illustrating the lecture material, another lecture and, in the evenings, informal seminars on a variety of theoretical topics. On the last night a dinner was held at Bruce Hall, where the visitors had stayed. The participants ranged from honours year students to senior academics, and the lecturers and tutors came from the Research School of Chemistry, the Department of Chemistry (SGS), other Australian universities and CSIRO. □

THE BATTLE OF THE BUG

With the fall from favor of DDT as a weapon in the battle against insect pests, chemists and biologists throughout the world have now turned to biological methods of control of insect populations.

The new generals in the battle of the bug come from Sweden, the USA, Australia, and some other countries.

In Australia they are in Canberra's Research School of Chemistry at the Australian National University and the CSIRO's Entomology Division.

The new techniques are only recent.

They follow a warning in 1962 by Rachel Carson in her

be lured to a hostile environment with an abundance of natural predators, or to a pool with sticky compounds where they may be trapped, a CSIRO scientist told us.

The ANU's Research School of Chemistry and the CSIRO are working hand in hand. Head of the

If the hormone gets into the eggs they won't hatch.

"In Prague they gave it to a male who is then rendered the females eggs infertile and then she transmitted it to other males and rendered them infertile.

"The trouble is getting it ct at the correct

g with these hor- tainst pesticides is an insect can immunity to a is doubtful can build up an his own hor- are needed for

generals in the bug recognises al behavior of determined by ounds, eg. the

irch, as a chem- nterested in the sising chemicals lication of these pounds is in the biologists. the insect hor- xtension of his ormones, where working since loped the syn- which made

the oral contraceptive possible.

Sterilising insects is another weapon scientists are using to keep insect populations down to "manageable" proportions.

The USA has proved to be the leader in this field.

In 1937 Dr Edyard Knipling theorised that a livestock pest, the screwworm, could be eradicated by releasing a number of sterilised male flies who would compete with fertile males.

The screwworm was killing goats and cattle in the island of Curacao in the Dutch Antilles. He rendered thousands of flies infertile by exposing them to X-rays. This broke up their chromosomes, making fertilisation impossible.

Each week he released 150,000 sterile flies. At the end of three months there were no screwworms left.

The livestock industry in Florida heard of the results. Curacao was only 107 square mile, but Florida and the adjacent States were 50,000 square miles.

In 18 months 2,750,000,000 flies were released. By 1958 the screwworm disappeared from Florida.

Australia may not have a screwworm problem, but we do have about 50,000 known insect species.

About 5000 may be called pests and of these far less than 100 cause stock and crop damage.

What Australia lacks in quantity of research facilities (in the US they have 70 labs, 40 greenhouses, 700 barns and other buildings and 10,738 acres) it makes up for in quality.

The Research School of Chemistry is the best chemistry building in the world, according to Professor Birch, architecturally and technically.

And with the "Silent CSIRO" they are making world history in the big battle of the bug.

Chemicals influence insect behaviour, scientists find

Scientists in the Research School of Chemistry have succeeded in determing the structure of a compound used by termites for marking trails to food to be followed by other termites of the same species. Having found that chemical substances can have a specific influence on the behaviour of insects, scientists believe this behaviour is potentially controllable.

The termite used in the experiments was *nasutitermes*, one of the two principal termites found in the Canberra area.

Speaking of the work last week, Professor A.J. Birch, Professor of Organic Chemistry, Research School of Chemistry, said the compound had been found to be a diterpene hydrocarbon. Professor Birch said there had been many difficulties to be overcome in the course of the work, which had been proceeding for about eighteen months. The work in this area had already been initiated by Dr B. Moore, of the Entomology Division of CSIRO. The chief difficulty lay in the fact that there was only a minute amount of the substance in any one insect. About twenty kilogrammes of termites were needed to yield three milligrammes of the substance, and even then it is mixed up with other things and so was difficult to refine to anything like a state of purity.

Professor Birch said that the success of the work had been made possible by the sophisticated nature of the equipment available in the Research School of Chemistry, where the work is being carried out by postgraduate student Mr John Corrie, under Professor Birch's supervision.

Professor Birch said that the nearest chemical relation to the hydrocarbon found in the termites occurred in the resin of certain pine trees. The substance in the pine resin had also been found to have some biological activity and there was speculation on the possible interaction of pine trees and termites.

Attempts are now being made in the RSC to synthesise the compound, but this is no easy task.

Professor Birch will report to a congress on pure and applied chemistry in Boston in July on the work being done in this field in Canberra.

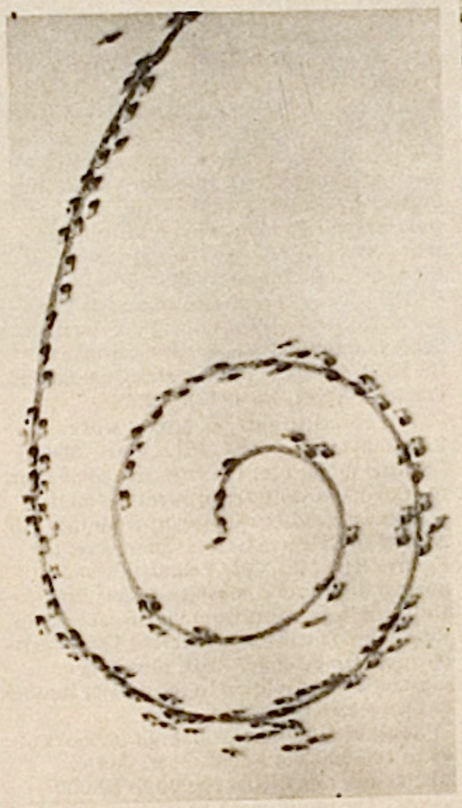
Last week Professor Birch described the work as 'one more facet in the interesting story that is being unravelled of chemical influences on insect behaviour.'

'The social behaviour of insects is controlled to a considerable degree by chemistry,' he said. 'Sex attractants enable mating to occur by the selection of partners over a wide area; the emission of alarm compounds in the case of attack warns other insects in the nest; and toxic protective substances provide protection by acting as "poison gases" on enemies. These are all examples which involve the intervention of fairly simple chemical substances.'

Having found that chemical substances can have a specific influence on the behaviour of insects, scientists believe this behaviour is potentially controllable. Thus, the chemical knowledge now being gained could possibly be used for the specific control of insects, in contrast to the wholesale and indiscriminate destruction caused by insecticides such as DDT.

The difficulty of getting enough of the compounds for use in experimental work underlines the value of being able to synthesise them in the laboratory. But even if this were achieved there would be other problems to be overcome before compounds such as the trail substance could be used for the biological control of insect pests. For example, females attract males by minute quantities of sex-attractant compounds. If these compounds or mixtures could be synthesised and used to lead the male insects to a bait, it would only be effective if *all* males were attracted, and this would be extremely difficult to achieve.

Also, the compound would have to be in just the right concentration. 'Just to pour the stuff out of a bottle would do no good,' said Professor Birch.



Blind termites (nasutitermes exitiosus) follow an artificial scent-trail laid on a pencil trace.□

Science on termites' tail trail

By JON WOOD

Scientists at the ANU Research School of Chemistry have isolated a termite trail chemical from sandalwood oil and have synthesised it in the laboratory.

The chemical is a mimic of the natural trail-laying compound produced in glands in the tails of certain termites. They secrete it as they return to their nest after finding a good food supply. Other termites then use their antennae to follow the track back to the food.

Dr B. Moore, of the CSIRO entomology division in Canberra, discovered that some termites would follow a trail of Western Australian sandalwood oil. Under the supervision of the dean of the school, Professor A. J. Birch, Dr V. H. Powell and Mr K. Chamberlain, in collaboration with the CSIRO, isolated the active chemical which the termites followed in sandalwood oil.

Termites on a false scent

They then reproduced it in the laboratory beginning with a commercially available chemical called Farnesol.

Professor Birch, who is in Africa on a short teaching visit, has said that the practical application of this development has yet to be investigated. It seemed to hold promise of a highly selective insect control.

The synthesis of insect hormones could lead to highly effective and safe insect control, as these hormones are usually harmless to other species, but play a vital role in the behaviour of their particular species.

Dr Moore said yesterday that he would like to work on the hormones critical in the bush fly, but this required co-operation with entomologists and other scientists, and also money.

There is a brain drain

There is a "brain drain" from Australia among chemists, according to the head of the ANU Research School of Chemistry, Professor A. J. Birch.

With a fellow Australian, Prof David Craig, Birch designed the new school after being approached by the Government.

They were both at Manchester University at the time and the Commonwealth Government sent its rcahitects and technical staff to Britain to study their design of he new school.

"When I was in Britain," said Prof Birch, "I met six professors who were Australian. I also met a lot of good research students.

"They were good. They had an original approach to things. This is very good. That is why they stay overseas. There are no opportunities here for them.

"All the Government here seems to be doing is making new scientists for the USA. That may be very nice . . . but they are needed here.

"I'll give you a good example. I advertise for one research chemist. I get more than 20 applications. This is the index of bad employment opportunities for chemists.

"There seems to be a point of view that overseas research people are better than the indigenous chemists . . . they say that they must be superior and so on.

"Let's take nickel extraction. They spend millions paying a licencing fee for a foreign (not indigenous) contraption instead of spending the same amount on setting up our very own plant.

"It is not a matter of overproducing scientists, it is a matter of under-using them," he said.

The matter of scientists working for international combines reached a peak in the Department of Trade and Industry when a senior officer discovered that an Australian scientist working on research and development had evolved a new process.

The process was registered by the head office in the USA and the Australian subsidiary has to pay licensing fees to the US parent company to manufacture the product.

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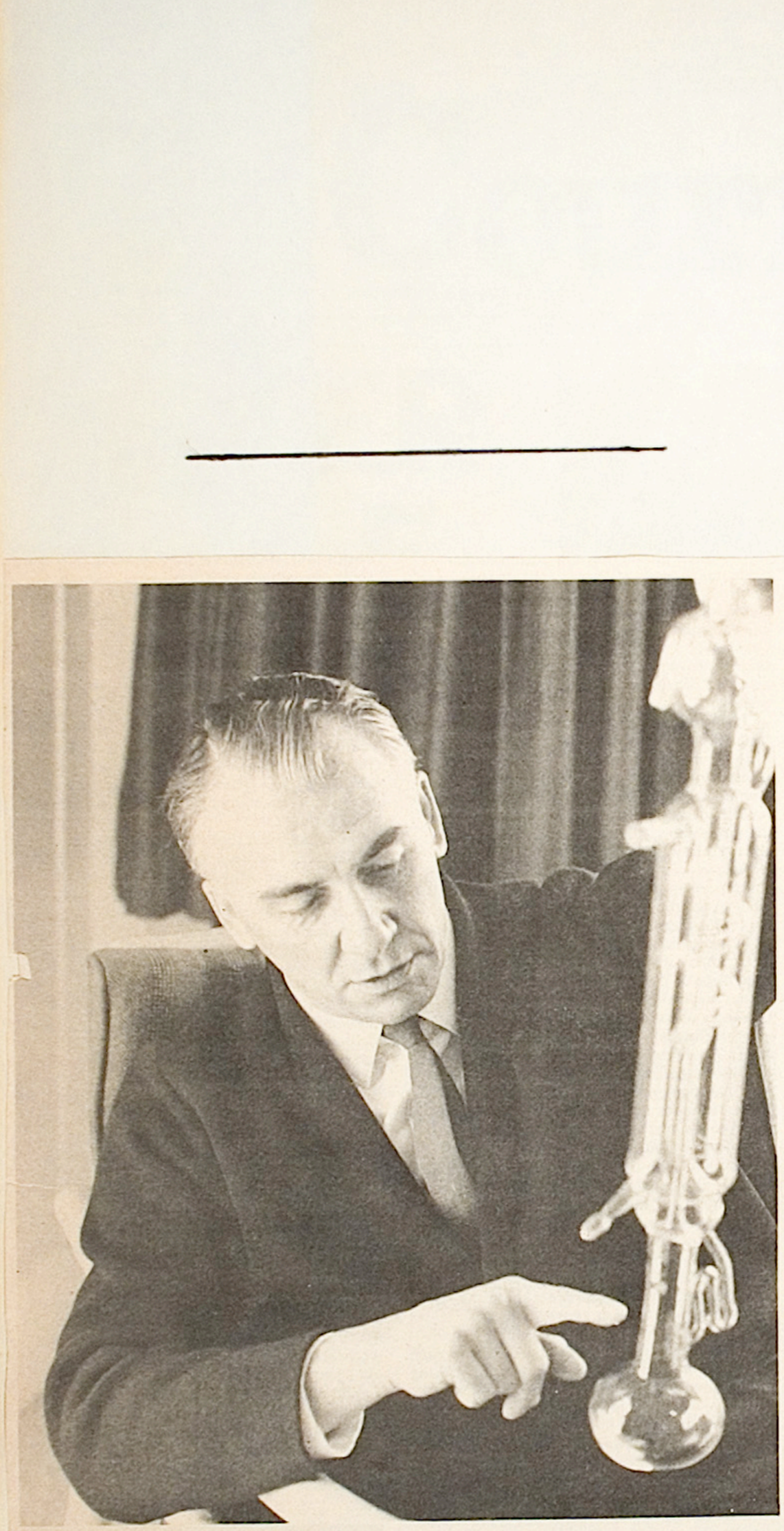

Mr Tys with a high vacuum three-stage mercury pump of his own making. In blowing the glass for equipment such as this Mr Tys works closely with the scientists who will be using it.

Glassblower as Churchill Fellow

Mr W.C. Tys, senior glassblower in the Research School of Chemistry, left Canberra early this month on a Churchill Fellowship which will take him to universities and scientific institutions in the United States, Europe and Britain to observe the latest in glassblowing techniques and equipment.

The first glassblower to receive a Churchill Fellowship, Mr Tys has been with the University for eighteen years. A Dutchman, he learnt his art with Philips Industries in Holland. He then worked for a time in the University of Leyden and was recruited to ANU late in 1951. He began work in the Research School of Physical Sciences early in the following year and was there until early this year, when he moved to the Research School of Chemistry. He made the change because the glassblowing needs of Physical Sciences were tailing off, while the Research School of Chemistry was new and required a great deal of new glass equipment.

Mr Tys works in both glass and quartz and he will take a special interest in work being done with quartz overseas. Shortly before he left Canberra, Mr Tys said the Research School of Chemistry was making increasing use of quartz, which can withstand much higher temperatures than normal glass and enables ultra violet light to pass through it. However, work in quartz needs special facilities and very high temperatures. Considerable work in this field is being done in the United States and Mr Tys will see something of this in his weeks there.

Mr Tys's Churchill Fellowship is for fifteen weeks and he will supplement it with three months' long service leave which will enable him to renew acquaintance with family and friends in Holland.

June 1970

Uncertain future for Ph Ds in Chemistry

Newly graduated Ph Ds in Chemistry face an uncertain future in Australia if they rely on employment with their traditional employers in education, government and industry. This is the finding of a survey of employment prospects in Australia for doctoral graduates in Chemistry recently undertaken by a Careers Sub-Committee in the Research School of Chemistry.

The committee worked with the co-operation of heads of Chemistry departments in Australian universities, CSIRO, the chemistry industry and Commonwealth and State governments. It found that by the end of 1972 almost 8 per cent of new Ph Ds in Chemistry would be unlikely to find work in the fields of research, development and management. Even more will be unable to find permanent positions in these fields. The committee estimates that more than one quarter of all Ph Ds in Chemistry will have to go into temporary positions on graduation. Temporary positions usually have a tenure of only two or three years. Australian universities are expected to produce 450 Ph Ds in Chemistry in 1969–71, when the total requirements of traditional employers for both permanent and temporary positions will amount to only 415.

In the four years ending in 1972 almost 600 Ph Ds in Chemistry are expected to graduate in Australia. This is twice the widely circulated estimate of Ph D. graduates made for this period five years ago, and is more than twice the total number of Ph Ds in Chemistry who graduated in Australia before 1965.

The Chairman of the Careers Sub-Committee, Dr A.J. Parker, said last week that in the 1960s an overwhelming belief had arisen in the importance of scientists to industrialised western society. Australia shared this belief along with the countries of Western Europe, the United States, Canada and Britain. All these countries had taken measures to encourage the training of more scientists, but it could be questioned whether sufficient thought had been given to the consequences of this policy, including how the newly qualified scientists might be employed.

Australia, like other developed countries, made available more scholarships for postgraduate study in science. More finance was made available to universities for staff, laboratories and research, and because of the belief that the nation's greatest asset was well trained scientists, some universities lowered their previously very high standards of entry for postgraduate study.

Up to about 1966 Ph Ds in Chemistry could look forward to going abroad to do postdoctoral work and then returning to a permanent position, usually in a university. There were plenty of permanent academic posts for these people but now postgraduate students in Chemistry can look forward to about forty permanent positions becoming available in their fields in the next three years. In correspondence and conversations with heads of Chemistry departments, members of the Careers Sub-Committee gained the impression that some universities were planning to fill temporary posts, previously held by graduate students, with experienced post-doctoral appointees.

Partly in response to the limited employment prospects for Ph Ds in Chemistry the Research School of Chemistry has cut its intake of post-graduate students. There are currently twenty-five students working for doctoral degrees in the Research School. This figure will rise to forty-five in 1975 but in each case the figure is about two-thirds that originally anticipated in planning for student numbers when the School was being established.

The Careers Sub-Committee found that while Australia spends an amount on scientific research and development comparable to that spent in other developed countries in relation to their wealth and population, the pattern of development is very different. A major difference lies in the relatively high proportion of research and development that is carried out in Australian Government laboratories, whereas a relatively small proportion of this activity is performed in Australian industry.

Australian industry also finances a comparatively small amount of the country's effort in research and development. However, such work as is financed by industry is paid for from industry's own funds, whereas abroad, and particularly in the United States, much of industry's work in research and development is financed from government funds, often for military and space purposes.

Dr Parker said that if Australian industry employed a proportion of Chemistry Ph Ds in research and development comparable with that in other developed countries, the anticipated surplus of doctoral graduates would disappear. However, he stressed that a surplus of Ph Ds was not in itself sufficient reason for more research and development activity in Australia.

'From a nationalistic point of view it might be considered a good thing for Australia to carry out its own scientific research, but there is not necessarily merit in every country pursuing parallel lines of enquiry. It leads to duplication of effort and a needless involvement of men and resources in comparatively small scale research programs. There is sense in companies drawing on the work of major research teams overseas. It is certainly less expensive, and the savings that accrue could well be used in other directions', he said.

Too many qualified chemists, says survey

By ROBERT LEHANE

Australia is facing an oversupply of qualified research chemists according to a university survey.

A survey of employment prospects for graduates in chemistry, with doctorates of philosophy has found that by the end of 1972 more than 25 per cent will probably have to take temporary jobs on graduation.

About 8 per cent will be unlikely to find any suitable research, development or management positions — temporary or permanent.

The survey was made by a committee of staff from the Research School of Chemistry at the Australian National University. Chemistry departments at other universities, the CSIRO, industry and Commonwealth and State governments co-operated.

It found that Australian universities were expected to produce 450 PhDs in chemistry between 1969 and 1971, but only 415 suitable temporary or permanent positions were expected to be available.

The universities were expected to produce almost 600 chemistry PhDs in the four years to 1972, twice the number estimated for the period five years ago and more than twice the total produced before 1965.

The ANU Research School of Chemistry has cut its planned intake of post-graduate students by about a third, partly in response to the limited employment opportunities.

FACULTY TALKS

The school's research staff will discuss the survey findings at a faculty meeting on Wednesday.

Dr A. J. Parker, chairman of the committee that made the survey, says the expected surplus of PhD graduates would disappear if Australian industry employed chemistry PhDs in research and development in a proportion comparable with that in other countries.

But, in a report on the survey in the ANU Reporter, the university administration's newspaper, he says a surplus of PhDs is not in itself sufficient reason for more research and development activity in Australia.

"From a nationalistic point of view it might be considered a good thing for Australia to carry out its own scientific research," he says, "but there is not necessarily merit in every country pursuing parallel lines of inquiry."

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TIM CLARK

ON CAMPUS

With the snow already on the mountains, homeless university skiers may soon be able to breathe a sigh of relief.

The Sports Union has been negotiating with the owners of Athol Ski Lodge at Thredbo to hire the lodge on certain weekends during the coming ski season.

An offer has already been received from the Munjarra Ski Club for discount rates on accommodation at their Thredbo and Perisher lodges.

Single bunks . . . but no complications?

More news from May

News continues to filter back from intervarsity contests held in May.

The inter-varsity women's rowing was rowed on the Longueville course in Sydney, where the ANU, under the leadership of Margaret Clark, was represented for the first time.

The ANU pair was only marginally outclassed by Sydney and WA and this may be attributed mainly to the lack of experience in racing, from which all ACT women's crews suffer because of the lack of competition here.

This problem may be remedied in the near year as the ACT has been chosen as the venue for the next Australian Women's Rowing Championship Regatta.

Inter-varsity rifle shooting was conducted by the WAU rifle club at the Swanbourne Rifle Range in Perth.

Lackie Fullerton reports that ANU battled against rain, wind and free alcohol, to win a wooden spooner's trophy after narrowly defeating South Australia's three representatives.

Melbourne were once again winners, with the best shot coming from John Madden who scored a remarkable 298 out of a possible 300, thus creating a new Australian IV record.

Strong arm of law

The grand final of the intra-campus basketball was won in fine style by Law, defeating NUCC (National University Caving Club) by four points, in a willing encounter.

In a magnanimous gesture law player Neil Gray [illegible] himself [illegible] the trophy at the conclusion of the game.

The intra-campus volleyball was won by the crack Research School of Chemistry I team, defeating Accounts two games to one.

Cavemen go underground

After their defeat in the basketball, caving club members have returned underground.

A renewed interest has been shown in earthmoving, and at present a "dig" is in progress at Narrengullen, a river cave (near Wee Jasper) where the water level has been raised by a siltation produced dam.

Excavations also are being carried out at a sinkhole in the highly cavernous Buchan limestone in Victoria, where if persistent the diggers may be rewarded by entry into a previously unexplored cave.

Fencing surprise

On Saturday eight members of the ANU Fencing Club competed in the first ACT Amateur Fencing Association Competition for 1971.

Run as a surprise teams event, it gave beginners an ideal opportunity to become familiar with competition procedure.

The competition was held in the gymnasium at Duntroon, where all four ACT fencing clubs were represented: Canberra, Duntroon, ANU, and the newly formed Woden Valley club.

Soccer kicks on

The ANU Soccer club is continuing on from last year's good performances.

The club, one of the most active in the University, has over 50 playing members in three senior competition divisions, one of them being professional.

The first two teams are in the top four in their competitions, and both appear to have excellent prospects for the finals.

A large social gathering is on the agenda for the near future where a keg of beer and several soccer films should provide the ingredients for success.

Mountain expedition

The Mountaineering Club has planned a trip to Budawango over the long weekend.

The trip will include an overnight camp in Cathedral Cave and an ascent of Mount Owen to view the monolith valley.

The exhibition, of beginners' standard, will be under the able leadership of Lloyd Monsborough.

Deanship of RSC: Council approved the principle that a Dean of the Research School of Chemistry be appointed from among the professors of the School every three years. It was agreed that each professor would be eligible for appointment as Dean but the appointment would be a matter for decision by Council. However, Council agreed that it would not be committed to a system of automatic rotation of the Deanship or any particular arrangements for rotation, nor would there be any assurance of every professor in the School being appointed Dean in course of time.

Third Chair in RSC filled

Professor R.L. Martin (above), Professor of Inorganic Chemistry and Dean of the Faculty of Science in the University of Melbourne, will move to Canberra in July next year to take up his appointment to the foundation Chair of Inorganic Chemistry in the Research School of Chemistry.

The Chair of Inorganic Chemistry is the third to be established in the Research School. Chairs of Organic Chemistry and Physical and Theoretical Chemistry were filled when the Research School was established in 1967.

A Master of Science of the University of Melbourne, Professor Martin also holds the degrees of PhD and ScD from the University of Cambridge. He enjoys a world-wide reputation for his original research in inorganic and physical chemistry and in chemical physics, especially in the area of the relation of chemical interaction and magnetic properties.

Before taking the Chair of Inorganic Chemistry at Melbourne in 1962, Professor Martin was associate research manager in the central research laboratories of ICI, Melbourne, where he was responsible for many of the research and development activities in such areas as plastics, minerals, explosives and heavy inorganic chemicals.

In 1968 he was awarded the H.G. Smith Memorial Medal by the Council of the Royal Australian Chemical Institute for his published research contributions to chemical science.

In April this year Professor Martin was elected a Fellow of the Australian Academy of Science. The Academy citation named his major work as that on the magnetism and structure of transition element compounds. His early magnetic studies on copper acetate and related compounds first drew attention to the copper-copper interactions that were one of the starting points of the current widespread interest in metal-metal bonds.

Professor Martin is aged 45 and is married with four children. He is the son of Sir Leslie Martin, Dean of the Faculty of Military Studies in the Royal Military College, Duntroon. □

Professor Birch expresses his reservations about patent policy

Professor A.J. BIRCH, Professor of Organic Chemistry, although a member of the Council committee which recommended the University's new patents policy (see Council news, page 2, 'Reporter', 8 October 1971, and 'ANU News', November 1971), was abroad during its deliberations. Although the general tenor of the report is in line with suggestions he has made over the last four years and he believes that the University has a role in the development of patentable work, he also believes that this should stop short of applied work and that there should be a sliding scale of benefits to inventors rather than a set percentage of net income from a patent. In the following interview Professor Birch discusses the implications and the background of the new patents policy.

'The fact that work is patentable implies that it has some direct application,' Professor Birch said. 'It can in one sense therefore be called "applied". However, despite this, it can be as good pure science as any other pure science. The word "applied" does arouse some emotional feelings in many academics, and there is clearly a rather arbitrary division between pure and applied work which raises the question of what subjects are suitable for universities.

'Genuine applied research is the application of principles already known. I do not think that it is suitable to a university, which should train students to look for something genuinely new. On the other hand, if some novel principle is discovered, there is a value in demonstrating how it might be exploited, and the main question is where to stop. This point may in a number of instances be dictated by costs and by the organisation of universities.

'With pharmaceuticals, for instance, the initial discovery of a drug may represent one per cent of the final cost of production; development may represent another 10 per cent and the rest is in setting up the actual production. The university is very badly suited both by its organisation and finance to attempt the second stage and obviously should have nothing to do with the third.'

Professor Birch was asked whether it were not in the public interest to make discoveries freely available to whoever could make use of them. On balance he thought not.

'If a basic principle is discovered which may have an application I think the university has some responsibility to examine it to see if it has any genuine possibility of application. If it has, then arrangements should be made to pass on the highly expensive and technical development to whoever is best suited to this work. The principle, however, should first be patented by the university to protect its and the public's interest.

'But the idea of universities patenting discoveries raises some disagreement. People say that the University should conduct work for the good of humanity and everything should be open. I agree that work should be published freely but the plain fact is that if it is not patented the university loses control of what happens to it.

'If you do not have control you cannot press development, and in fact you have no further say in the matter at all. Developments may be slow, without an interested party to press them, or be carried out by the wrong people. A drug firm is not going to spend the $5-10 million now necessary to develop a new drug to the point of usefulness and acceptance, to find that a rival firm, perhaps in a low cost area, then takes over. It needs some guarantee of return of its expenditure. Patents can frequently be taken out on minor modifications of a revealed, and therefore unpatentable process, to the enormous benefit frequently of firms and countries who made no contributions to the original discovery at all.

'In any case,why should not the university and the discoverers derive some benefit? I think also that it is very useful for the public image of universities not only to be doing useful basic work, but sometimes to be clearly seen doing it in terms which laymen and politicians can understand.'

Professor Birch was asked what were the arguments put forward against this process and what he thought about them.

'A major one is based on the ideal of a community of scholars, each of whom is engaged in work which is academically equally valuable whether it is potentially applicable in practical affairs or not. If the world were differently organised I might agree with this, but realities do not in my opinion make it a workable ideal. It has already been breached for many years, for instance, in premium salaries for medically qualified university staff, or even in different salaries for different "levels" of staff.

'An argument which has more practical weight is that rewards for applied results might well distort the desirable pattern of research work. I think that this objection can be overemphasised. Most academics are so because they have original minds and are interested in academic life, otherwise they would be in business. Furthermore, in my experience they are usually very responsible and dedicated. The major practical point is to see that rewards are not potentially so high that temptations are irresistible to the weaker brethren. There could also be a bad effect on morale and on the attitude of other staff members.'

Professor Birch was asked how he would attempt to guard against this difficulty.

'Although I believe that staff inventors should benefit financially, there should be a sliding scale which guarantees that no matter how high the income, there is effectively a ceiling so far as staff is concerned. I do not think this should be a fixed point, but vary with the value to the community of the discovery.'

Professor Birch was asked if he thought the pursuit of patentable work would lead to undesirable secrecy and lack of communication.

'If I believed that,I would be the first to advocate scrapping patents. I do not. So far as publication is concerned there is no real difficulty. Most people take much longer to write articles than is required for the taking out of provisional patent cover. Inhibition of communications between research workers in a department is a far more serious problem if it were necessary. I do not believe that it is, even at the risk of leakages of information outside. The need for secrecy is greatly overestimated in industry, and is in any case mostly related to very applied questions, such as the detailed design of some new piece of machinery. It could be necessary occasionally to be a little cautious about the ultimate applied possibilities of a piece of pure research, but this need not, in fact must not, inhibit open discussion of the pure research itself.

He was asked whether he thought the University would derive any other benefits from the attitude he advocated.

'I think it would lead to much greater realism in assessing areas of research. The term "academic" is used abusively in some quarters partly through misunderstanding but partly justifiably. I repeat that I am not advocating applied research, but if you have a choice of several areas of basic work, one of which looks as if it might be some use eventually, why not choose it?

'The academic reply to this is that it is impossible in many cases to foresee uses and that major innovations frequently depend on ability to pursue "happy accidents". I am emphatically not against that, but I think that "happy accidents" will occur in any case, since they are dependent much more on the ability of the innovator to perceive them than they are on the exact topic.

'I think that it is worth at least considering the "relevance" of a topic in the broadest sense, and the community which in the end pays the bill, will feel more kindly disposed if it believes that some thought is being taken of its long term interests. The image of the academic in many quarters is of an introvert busy on some esoteric investigation of interest to him and about three other people, or else of an evil magician thoughtlessly filling the world with devices which will destroy it, and which he has no desire or ability to control. An obviously businesslike and responsible attitude to exploitation of basic discoveries will help to make the community feel that academics can be trusted.' □

RSC scientists made their point

When Professorial Fellow Dr A.J. Parker and his colleagues in the physical organic section of the Research School of Chemistry sought to demonstrate that universities, and especially PhD graduates in chemistry, had knowledge and skills that could well be used by industry, they succeeded to a remarkable degree. They discovered methods of extracting and refining copper that could change existing industrial processes and be of considerable benefit to the metals industry.

Patent applications embracing the discoveries have been filed and a small unit especially established to develop the practical and commercial implications of the discoveries.

The research team that made the discoveries included, as well as Dr Parker, a group of organic chemists and electrochemists, and four recent PhD graduates. They found solvents which allow copper to be processed via cuprous salts, rather than the conventional cupric salts, together with a new process which avoids the slow electrorefining step in the purification of blister copper.

Apart from the possible economic advantages,the new processes may help to reduce the pollution problem of sulphur dioxide emission in conventional smelting.

Thus far the experiments have only been on a laboratory scale. They have been highly successful but much more work must be done before they can be proved on an industrial scale.

However, Dr Parker said last week that the results certainly justified further development to the pilot plant stage. He said he hoped that an Australian company would join with the University in the development and thus come to occupy a dominant position in world copper processing like that occupied by the Canadian company, Sherritt-Gordon Mines, in the processing of nickel.

'We need more outlets and job satisfaction for our highly talented young research chemists,' he said. 'For many reasons, it is essential that Australian mining companies seize every opportunity to find and develop more Australian processes for producing pure metals from our natural resources.

'After all, how can the average Australian find satisfaction in our technology if the best we can do is dig up a mountain and load it onto an ore carrier?' he asked.

Picture: Dr Parker (right) and Postdoctoral Fellow Dr David Muir removing acetonitrile from a cuprous sulphate solution to produce pure copper in the laboratory. □

ANU scientists make metallurgical advance

Scientists at the Australian National University have succeeded in a search for a better method of refining and extracting copper.

Dr Parker

The Vice-Chancellor of the university, Sir John Crawford, announced the new process yesterday. The group chiefly responsible is the physical organic section of the Research School of Chemistry headed by Dr A. J. Parker.

Dr Parker and a group of organic chemists and electro-chemists made the discovery as part of an attempt to show that universities had knowledge and skills which could well be used by industry.

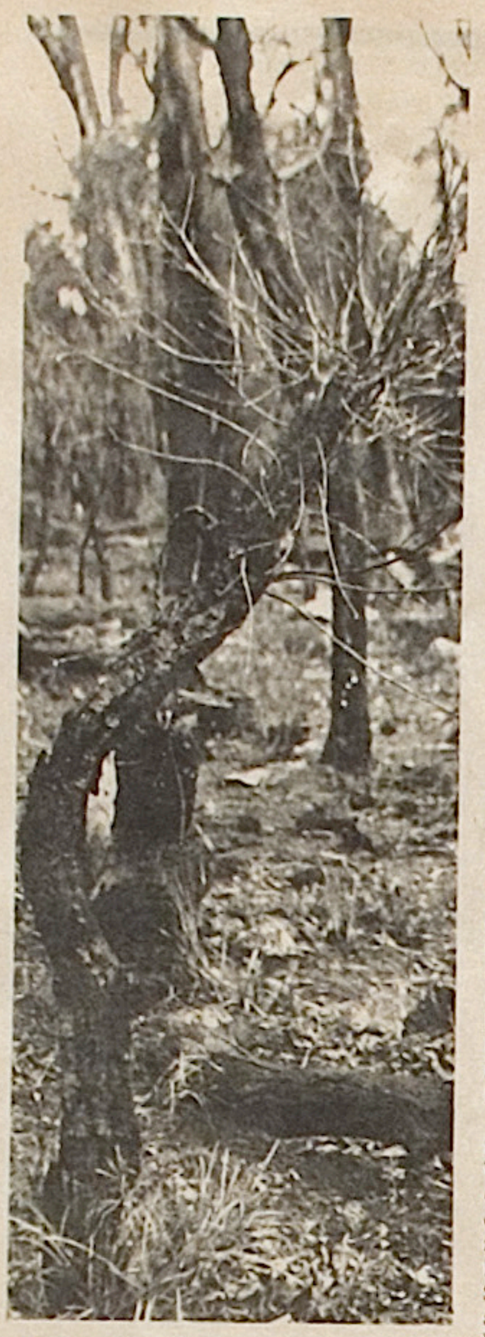
They discovered solvents which would allow copper to be processed with cuprous salts rather than the conventional cupric salts, together with a new process which avoids the electro-refining step in the purification of blister copper.

Patent applications covering the discoveries have been filed.

Dr Parker said yesterday that experiments on the laboratory scale had been highly successful, but much more work would have to be done before they could be proved on an industrial scale. Results so far had justified development to the pilot plant stage.

He hoped an Australian company would join the ANU in the development and thus occupy a major world position in copper processing. It seemed to him essential that Australian mining companies seize every opportunity to find and develop more Australian processes for producing pure metals from natural resources.

"How can the average Australian find satisfaction in our technology if the best we can do is dig up a mountain and load it into an ore carrier?" he said.



Not the aftermath of a bushfire, but of the destructive root rot fungus Phytophthora.

Forestry leads fungus fight

The Department of Forestry in co-operation with other University and outside bodies is leading the fight against a destructive root rot fungus. The fungus, *Phytophthora cinnamomi*, was so called because in 1922 it was first identified attacking cinnamon plants in Sumatra

It damages a wide range of agricultural, horticultural and forest crops throughout the world and is of great concern to pathologists. Interest in the fungus arose originally through its attacks on crops such as pineapples, avocados, peaches and flowering plants such as rhododendrons.

In 1965 the fungus was found to be causing a serious decline in production of Western Australian native forests and particularly the Jarrah forests, where large trees were killed. This was the first record of the fungus being associated with die back of native forests in Australia.

The Forests Department of Western Australia, concerned by the economic consequences of die back, provided research funds to enable the Department of Forestry to study the disease. Additional support is now being provided by the Parks and Gardens Branch of the Department of the Interior, the Australian Research Grants Committee, the Forestry Commission of New South Wales, the Queensland Department of Forestry, the Forestry Commission of Tasmania, the Victorian Forests Commission, the South Australian Woods and Forests Department, Australian Paper Mills Forests Pty Ltd, Australian Pulp and Paper Manufacturers and Australian Newsprint Mills Ltd.

The research team in the University Department of Forestry is being led by Dr. W. A. Heather and Dr. B. H. Pratt, and includes a research assistant, honours and graduate students. The Forestry Department is working in collaboration with Mr R. W. Rickards and Dr K. Moody of the Research School of Chemistry and Dr C. J. Shepherd and Dr J. Philips of the CSIRO Divisions of Plant Industry and Biochemistry. Close liaison is also maintained with the various forest services and private industry in field sampling and trials.

Part of the research program is aimed at finding out the distribution of the fungus in Australia. Members of the Forestry Department have discovered the fungus in native and planted forests in Tasmania, Victoria, South Australia, New South Wales and Queensland. They have also found the fungus associated with dying trees and shrubs in the University grounds.

The disease fungus attacks and destroys the fine roots of plants. Without their fine roots the plants wither and die because they are unable to take in water. Depending on the plant's environment or physiological condition,death can appear to be a slow or an almost 'overnight' process.

It is not known for certain whether the fungus is a native Australian organism or whether it has been introduced from overseas. All of the available evidence indicates the fungus has been present in Australia for more than half a century at least. Due to the improved techniques of detection that have been developed the fungus is now known to be more widespread than was previously thought and to attack a wider range of plant species.

One reason for its success as a pathogen and the difficulty of control is the ability of the fungus to attack plants of many species in a variety of environments. This may be because it is a primitive, non-specialised fungus without the characteristics of other fungi which attack only a small variety of plants or parts of them.

At present there is no way of controlling the disease. The Department of Forestry is investigating various possible techniques. One method that has proved promising is the compounds produced by other soil organisms and which are antagonistic to the root rot fungus. One soil fungus has been discovered by the Department of Forestry which produces such a compound. This antagonistic compound has been identified and synthesised in the Research School of Chemistry and the synthetic chemical is now being laboratory tested against the disease fungus by the Department of Forestry.

Because of the growing interest in *Phytophthora cinnamomi* an entire section of this year's Australian Plant Pathology Conference will be devoted to a discussion of the disease

Faith shown in Territory's future

Dr P. F. Sinnett, who is to leave his position as National Heart Foundation Fellow in the Department of Clinical Science in July to become Foundation Professor of Human Biology in the University of Papua-New Guinea, believes that New Guinea offers unique opportunities for the establishment of research and teaching in medicine.

For example, in research the Faculty of Medicine is in an ideal position to study the health aspects of acculturation. 'Papua-New Guinea is one of the last of the emerging countries and we have a rare opportunity to participate in its emergence and to contribute to the health standards of the indigenous people ' said Dr Sinnett.

Dr Sinnett has no doubt that the people of the Territory have the competence and capacity to make the intellectual change necessary to move from a traditional culture to one embracing tertiary education. He has worked extensively on research projects in New Guinea and has been impressed with the capacity of the people who have worked with him after graduating from the Territory's high schools or the former Papuan Medical College.

He said his experience with the people of the Territory over the past four years had led him to accept the Chair of Human Biology at Port Moresby. However, he looks forward to the day when a member of the indigenous population will be qualified to accept this chair. 'As Papua-New Guinea moves to independence it is important that the country provide its own leaders in the academic as well as in the political field,' he said.

Speaking of the role of the University of Papua-New Guinea, and especially of its Faculty of Medicine, Dr Sinnett said that the Faculty had a primary responsibility to produce graduates who would provide medical services in a country that was extremely short of qualified doctors. However, he said this must be achieved without sacrificing academic standards. 'The new graduates should be as acceptable internationally as are graduates from Australian universities,' he said.

Dr Sinnett also stressed the importance of stimulating interest in medical research, especially in areas appropriate to the University's opportunities in an emerging country.

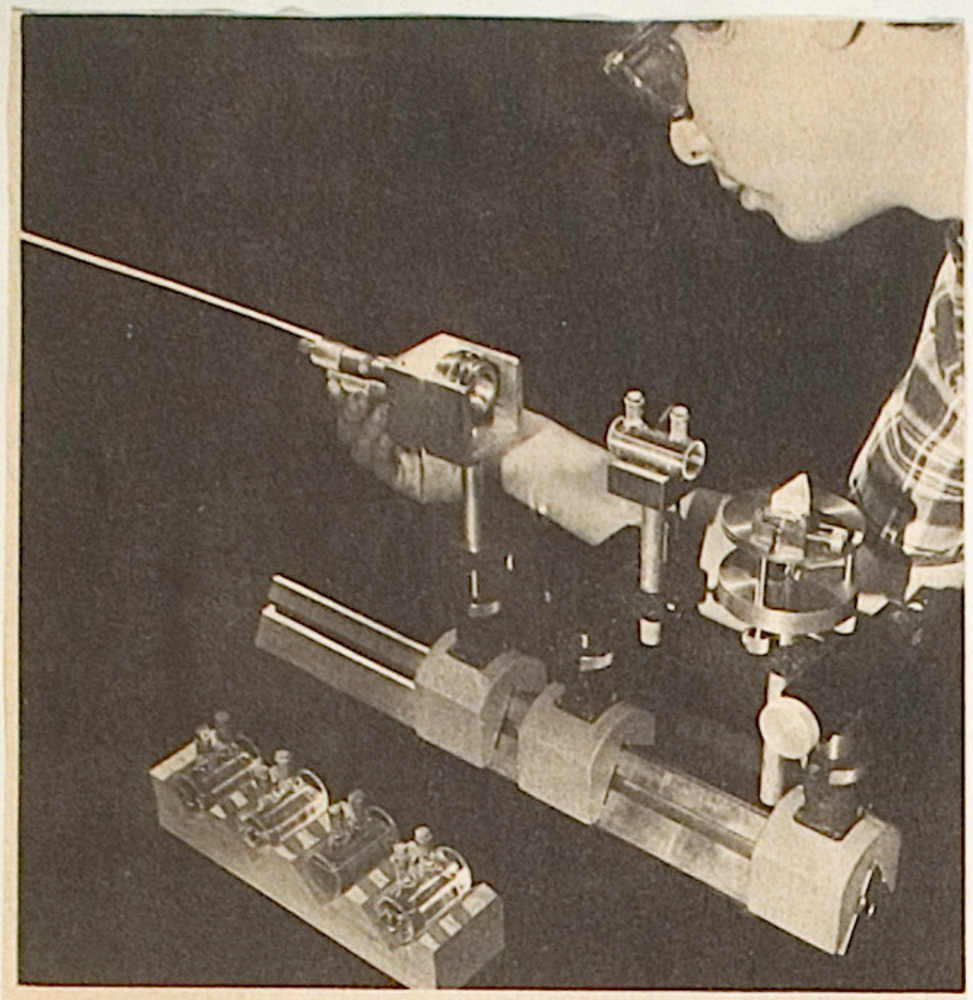
Dr Sinnett's Department of Human Biology will embrace the traditional disciplines of anatomy, physiology, biochemistry and pharmacology. In devising his curriculum Dr Sinnett is taking what he considers to be the best of the traditional forms of medical teaching from the established universities of Britain, America and Australia, and adapting them to a completely new situation that does not involve an established hierarchical structure of disciplines. Dr Sinnett said he hoped the result would be a truly integrated curriculum that would fit in with the principles that guided the foundation of the Department of Human Biology in the John Curtin School of Medical Research.

Dr Sinnett also sees the University of Papua-New Guinea as offering a unique challenge to young men and women graduating from Australian universities to make a contribution to academic life in an emerging country for which Australia has a special responsibility. □

CORRECTIONS

Concerning the article 'The role of the research student in "a community of scholars" ' (p. 2, *ANU Reporter*, 12 March), it has been pointed out that it is not a fact that students *are* represented on faculties in the way the writer, Mr Alastair Crombie, suggested. However, it is a fact that some faculties have invited students to attend and have accepted the principle of student representation in various ways in the various Research Schools, but the amendments to the statutes and rules to formalise such arrangements have still to be made.

Also, it was incorrectly stated in the article 'Visitor makes it permanent' (p. 3) that Professor Leonard Broom had been appointed to a Chair of Sociology in the Research School of Pacific Studies. Professor Broom will in fact hold his chair in the Research School of Social Sciences. □



Dye laser helps crystals study

Scientists in the Research School of Chemistry have saved the University a considerable sum by assembling their own dye laser to help them in a study of the properties of crystals.

Imported dye laser attachments may be bought for about $5,000. That assembled in the Research School of Chemistry cost about $20 for the materials.

Most of the work was done by Dr Albert Mau, a Postdoctoral Fellow in the physical and theoretical section of the Research School, with Professorial Fellow Dr James Ferguson.

By passing light pulses from a commercial nitrogen laser through small cylinders containing various dyes, it is possible to obtain wave lengths ranging from 350 nanometres (giving near ultraviolet light) to 640 nanometres (giving a brilliant red light). Without the dye attachment the laser would have only the one wave length of 337 nanometres.

The secret of the attachment is in the dyes used, but Dr Ferguson and Dr Mau plan to publish the composition of their dye solutions (which are really very simple) in an Australian chemical journal.

While the cheapness of the equipment is clearly one of its attractions, the greater interest for scientists is in the research it makes possible.

Dr Ferguson said the need for a dye laser was realised when he and Dr Mau began studying energy levels of certain substances. This involved the study of pairs of molecules so that a better understanding could be gained of crystals as a whole, crystal structures being repeated patterns of pairs of molecules. However, a problem with the study of molecules and their pairs is that to study the emmission of light as fluorescence, the time the light takes to radiate is only a few nanoseconds (one nanosecond equals 1,000 millionth of a second). To look at the time properties of the emmission it is necessary to work with a light source that has a pulse width less than the decay time of the light from the molecule.

Dr Ferguson and Dr Mau had access to a commercial nitrogen laser but found its usefulness limited because some molecules absorb light very poorly at the laser's wavelength of 337 nanometres. The answer was to convert the laser into a dye laser so that the laser's usual ultraviolet wavelength could be used for any molecule and passed through a cylinder filled with a dye solution that absorbed and emmitted the light very intensely. The pulse width can be made as short as two nanoseconds, which is considerably shorter than the 10 nanosecond pulse width of the nitrogen laser.

With the dye cylinders, the operator simply dials a line and the equipment can produce a wide range of pulse widths. As well as being capable of being tuned over this wide frequency range, and being relatively inexpensive to set up, the dye laser is easy to maintain.

Dr Mau explained that dye lasers differed from the better known lasers of science fiction in not being as 'energetic'. A carbon dioxide laser, for example, can cut in half a person who is careless enough to walk across its beam. Also, the dye laser is much less powerful than pulsed ruby lasers which, if not handled carefully, can cause breakdown in any substance. However, the narrow pulse width of the dye laser gives it a wide range of applications in photochemistry.

Pictured above is Dr Mau working with the improvised dye cylinder laser attachment in the Research School of Chemistry. □

11/9/72.

ANU scientists on national committee

Two scientists at the Australian National University are among the foundation members of the Commonwealth Advisory Committee on Science and Technology.

They are Profesor Arthur J. Birch, professor of organic chemistry in the research school of chemistry, and Sir Rutherford Robertson, master of University House and director-designate of the research school of biological sciences.

The Minister for Education and Science, Mr Fraser, announced yesterday the foundation members of the 11-man committee.

Its chairman is Sir Colin Syme, formerly chairman of BHP Ltd, and now, among other things, director of the Australian Industry Development Corporation.

Mr Fraser said the committee would have the responsibility of assessing on a continuing basis, Australia's civil science and technology, requirements, resources, and potential.

The committee would be independent of the government, but would be assisted where required by departmental and other officers.

It would undertake studies and advise the Government on its own initiative as well as provide advice on matters referred to it by the government.

Mr Fraser said this would ensure that the benefits of an integrated and rationalised approach to scientific achievements and technological developments would be fully realised.

Professor Birch is treasurer, and Sir Rutherford president, of the Australian Academy of Science.

Professor Birch was professor of organic chemistry at Manchester University before becoming in 1967 the first dean of the research school of chemistry at ANU.

Other members of the committee are:

Mr Peter Ballieu, chairman and managing director of King Ranch Pastoral Company Pty Ltd and president of the Northern Territory Pastoral Lessees Association.

Professor Colin M. Donald, professor of agriculture at the University of Adelaide.

Mr Alan W. Hamer, managing director, ICI (Australia) Ltd.

Mr B. T. Loton, general manager, BHP Newcastle Steelworks.

Mr Russel T. Madigan, managing director, Hamersley Holdings Ltd, Director of CRA Ltd.

Professor Robert Street, professor and chairman, department of physics at Monash University and a member of the Australian Research Grants Committee.

Professor Bruce R. Williams, Vice-Chancellor and principal of the University of Sydney, member of the Reserve Bank board, member of the UK National Board for Prices and Incomes 1966-67 and member of the UK Central Advisory Council for Science and Technology.

Mr John G. Wilson, managing director, Australian Paper Manufacturers Ltd, director, British Petroleum Co (Aust) Ltd, director, Vickers (Aust) Ltd and a member of the council of Monash University.

Mr Fraser said he was delighted that men of such eminence had accepted the Government's invitation to join the advisory committee.

Council member outlines industry's problems in employing chemistry PhDs

When Mr John Yencken, a member of Council and a Director of P-E Consulting Group (Aust.) Pty Ltd, spoke to members of the Research School of Chemistry on Friday 19 November about the role of chemistry PhDs in industry, he saw two major problems: making the new PhD graduate in chemistry recognise both the possibility of non-academic employment and the training necessary for it, and getting the employer to use the new graduate effectively, to motivate him and give him job satisfaction.

Mr Yencken said these problems were well illustrated in recent studies of the problems of retaining young engineers employed in the public service and other large organisations. In many cases a high proportion of the new graduate intake had either left or had lost a sense of motivation within the first two years of joining. 'And', said Mr Yencken 'many of those they lost were probably those who, in the long term, they most needed to retain. There are two sides to this problem. The individual graduate has to adjust to his new environment, and an employer has to create an environment in which the new graduate can find challenge and satisfaction.

'In the eyes of the world the PhD graduate is an expensive product. After all, a lot of community funds have been spent in getting him his degree. On the other hand, the graduate has a high expectation of value from a future employer. He has foregone a lot of earnings, having earned little or nothing while studying for his first degree and probably, as a research student, having foregone many of the financial benefits he might have enjoyed had he gone into employment straight after having received his first degree. The employer on the other hand, generally is unwilling to pay a high salary to a new graduate from whom he will get minimal value until he has gained experience on the job'.

Mr Yencken said the PhD graduate was possibly among the top 1 per cent of the population in intelligence; he had the motivation and the ability to concentrate; he was numerate (in most disciplines), analytical and capable of logical thought and had a degree of creativity and originality. However, he lacked experience in leadership. He said, 'Leadership is not really essential in doing research to the PhD level.

'Similarly, the research worker is not used to the problems involved in making decisions in situations of uncertainty. The PhD candidate can carry out research experiments and, if these leave the answer uncertain, he can carry out more experiments to refine and develop his hypothesis until it looks right. The commercial man cannot afford the time to do this and very often he has to make decisions and draw conclusions from very uncertain or unreliable information. Frequently such a decision has to be taken, recognising that there is a high probability that it may not be the right one. So you must be aware of the possibility that you will have to change your decision, and change it quickly. This is something the scientist has great difficulty in understanding when he first comes into contact with the commercial decision-making situation.

'Speaking with some experience of applied research, I can appreciate the problems of telling someone that he has to stop work on a problem that is dear to his heart, when the chances of success are so small in relation to the potential benefit that the decision must be taken to stop the project. It is easier to start a program of research than it is to know when to take the decision to stop it, but it must be remembered that industrial research activities are directly related to improving the performance and profitability of the organisation which undertakes them'.

Mr Yencken said that research workers lacked an appreciation of value for money, or cost/benefit relationships. The P-E Consulting Group is presently conducting a study for the Commonwealth Advisory Committee on Advanced Education, which aims to study the working role of the engineer and from this make suggestions as to how his education might be improved. In interviews, qualified engineers working in industry commented that they had not been taught to 'put a dollar sign' on their designs. Similarly, no-one had told them how to persuade other people to accept their ideas. Mr Yencken said these answers indicated the need for a rethinking of the structure and methods of teaching so that engineers, and also chemists, were introduced in the course of their studies to the ideas of cost/benefit and the need to communicate.

'A man with a PhD has spent at least seven of the most important years of his life in a university and, because most people resist change, it is very tempting for him to stay on in the university environment after receiving his degree.' Mr Yencken said. 'According to a recent survey, some 50 per cent of PhDs in 1970 were in a university or college of advanced education environment, but Mr Yencken queried how many of these graduates would obtain true satisfaction from what they were doing. While some might enjoy teaching at the tertiary level, and others would make major discoveries in research, many would not. 'Is academic life the only challenge?' he asked, 'the only area where you can get sufficient challenge and satisfaction to compensate for the earnings you have foregone?'

Mr Yencken then quoted figures from a 1970 survey made by the Royal Australian Chemical Institute on the employment of chemistry PhDs in Australia. A total of 438 (or 50 per cent of the total) were employed in tertiary institutions; there were 162 in industry; 266 in government (mostly Commonwealth) service, and none in schools. He then compared the number of chemistry PhDs in these categories per million of the population, with figures from the United States. Australia had 29 chemistry PhDs per million of population in tertiary institutions in 1968, while the United States had 85 per million (Australia had 35 per million in 1970). Australia had 3 per million in industry (6.1 in 1970), while the United States had 125 per million. Australia had 20 per million in government service (21 in 1970) while the United States had 16 per million. The Australian survey showed no PhD respondents employed in schools.

The RACI report estimates that in 1973 there will be 144 new PhDs in chemistry and a demand for 128. About 27 per cent of that demand will come from industry, which means, said Mr Yencken, that a substantial proportion of scholars should be preparing for the transition from university to industry on completion of their degrees.

One way in which they might do this is by gaining some understanding of the economics of industry. Mr Yencken said that universities and research institutions should consider what could be done during a PhD's training to help those who were going into industry to be readier for it than they sometimes were. 'I don't think academic life is a very effective training for some of the things one finds in a commercial situation,' he said, suggesting that PhD courses might include some introduction to the process of commercial decision-making and applied and industrial research generally.

He said that optional course work might perhaps be offered relating to future employment in government and industry. 'It is important for individuals and the research schools as a whole to get some understanding of the problems of industry,' he said. 'This could mean talking to plant and industrial research managers and finding out those areas in need of research so that research can be done. This does not necessarily mean the setting up of a centre for applied research. Rather it means that people individually should look at the sort of things that go on in industry that may have some relevance to the research they are doing'.

Apart from research in specialised areas, Mr Yencken urged PhDs in chemistry to seek opportunities in industry as 'highly numerate and analytical problem-solvers'. 'The work, the decisions and the challenges of this sort of work can be every bit as great as those of solving a pure research problem,' Mr Yencken said.

Mr Yencken deplored the lack of PhDs in the ranks of secondary schools as teachers of science but did not blame PhDs for not going into the secondary education system because, in his words, 'this is not generally an environment at present which makes it attractive to intelligent, enquiring minds'. He said he had some personal knowledge of the effect a teacher with research qualifications could have on young students. This teacher had been able to show students what science was really about. This was not curricula and text books but an understanding of scientific method and practice in the study of the natural phenomena. He suggested that ANU should, together with State and private education authorities, investigate how teaching could be made an attractive career for at least some of those leaving university with a PhD in chemistry. □

CANBERRA TIMES 1972.

GANG GANG

A medal for the Birch reduction

PROFESSOR Arthur Birch, of the Research School of Chemistry at the ANU, has recently received his fourth learned-society medal in just over 12 months.

"I'm a bit worried about that — when people start getting medals one suspects they're almost finished", he said in dead-pan jest yesterday.

In fact, Professor Birch is particularly pleased with the latest, the Davy Medal, which is the Royal Society's most prestigious award for chemistry. He is the first Australian resident to receive it.

The citation is "for distinguished biosynthetic studies of organic natural products and his development of new reagents for reduction processes", which needs some explaining.

The last refers to Professor Birch's work which led to the discovery of oral contraceptives. "Actually, I was trying for cortical hormones for fighter pilots during the war", he said.

"They're related to sex hormones and I found a new reagent with which I produced analogues of male sex hormones. Further work was done in the US on female hormones using my reduction process and, quite by accident, oral contraceptives were evolved."

They are still being made by the basic synthesis, the Birch reduction, which he worked out. However, Professor Birch has personally gained nothing from the multi-million-dollar industry.

"I didn't take patents out, I wasn't experienced enough, and anyway at the time we were pretty busy having twins", he said.

Much of his work on the biosynthetic studies was done in Australia, where he worked out his theory about how a large number of plant and mould products are produced chemically by acetates.

"I worked that out in Sydney University in the '50s when I had no chemicals, no equipment and few students — I had nothing much but my brains to work with", he said.

"I left for Manchester University because I couldn't get the means of testing and proving the correctness of the theory, and I found it correlated all sorts of apparently unrelated products — like the tetracycline antibiotics, and the red and blue pigments of flowers".

These days, having returned to Australia in 1967 after planning the building of the Research School of Chemistry ("this beautiful, simple, scientific building is technically and aesthetically the best in the university"), he is still working in these fields.

Professor Birch

Using his reduction process Professor Birch is looking for useful analogues of prostaglandins — "they're a very important area so I thought we should be in it and this synthesis work is good for the students".

And in the biosynthesis area, "I'm trying to follow up toxic compounds on moulds. And, frankly, these days I wouldn't eat anything which had mould on it, even if the mould were chopped off and the rest cooked. I'm even beginning to look sideways at blue cheeses".

As well, Professor Birch is working in areas which he thinks will become important, particularly in organometallic chemistry, in which organic and inorganic chemistry are combined and in which there should be spin-off for the natural-gas and mining industries.

"This medal proves world-standard work can be done here — and recognised", he said.

"It's a team effort, of course. I haven't worked in a laboratory with my own hands for 15 years.

"And while I've been mainly concerned with synthetic methods in themselves, other people use them for a multitude of things and they have long-term relevance. Like the hormones for fighter pilots that led to the pill.

"I certainly don't have any ivory tower feelings about practical applications. In fact, the more the better— we're very derivative in Australia. We draw on the rest of the world, so we owe the rest of the world something."

CANBERRA TIMES 28-2-73

WA study of methods developed at ANU

New methods of extracting and refining copper, nickel, and silver, developed at the ANU, will be studied further at a mineral chemistry research unit to be set up at Murdoch University in Western Australia.

Dr A. J. Parker

The head of the new research unit will be Dr A. J. Parker, who developed the methods at the ANU Research School of Chemistry together with Dr D. Muir and Dr D. E. Giles.

Dr Parker has been appointed also as foundation Professor of Chemistry at Murdoch University. Dr Muir and Dr Giles will also transfer to Murdoch University in January, 1974, to set up the new research unit.

The ANU has lodged patent applications in 29 countries for the methods developed by the team, which are being examined by a number of Australian and foreign metal producers.

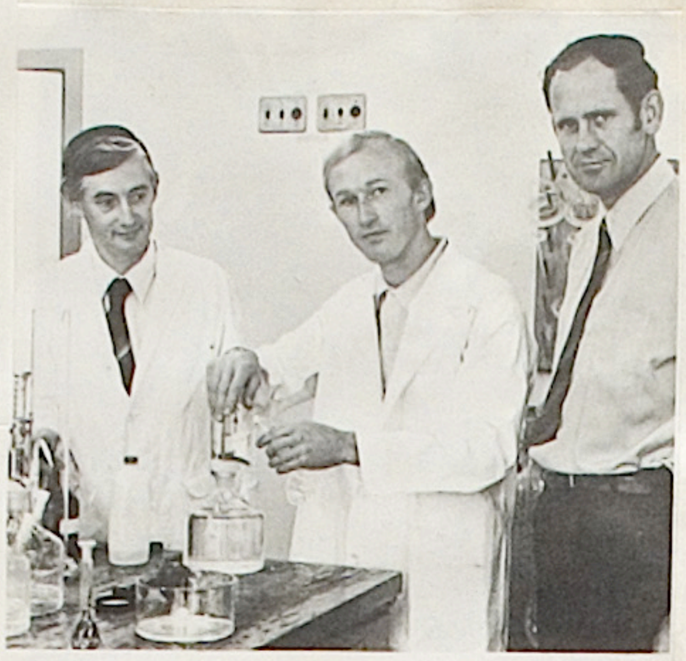
Dr Parker said yesterday that the new methods involved putting the ore into a tank of chemicals. The metal could then be removed from the resulting solution electrically or by other methods.

The most promising example had been the extraction of copper from its sulphides, carbonates, and oxides as well as from scrap copper.

Dr Parker said the new methods were speedy, produced metal of high purity, and were sufficiently inexpensive to be commercially competitive. He intended to have a chemical engineer join the research unit in Western Australia to investigate the industrial application of the new methods, which had so far been used only in the laboratory.

He anticipated that the extraction of copper by chemical processes would become more attractive as the costs of controlling pollution from smelters increased.

Conventional copper smelters gave off sulphur dioxide gas whereas the chemical method produced only solid sulphur in powdered form. Although the chemical solutions contained poisonous substances such as acetonitrile, which contains cyanide, they could be recycled and the small amount of residue safely treated.



Dr A. J. Parker (right) in his laboratory with Dr D. Muir and Dr. D. Giles discussing the development of his metal extraction method.

Dr Parker appointed to Murdoch University

Dr A.J. Parker, Professorial Fellow in the Research School of Chemistry, who has developed a new method of extracting minerals from ores, has been appointed foundation Professor of Chemistry at Murdoch University in Perth.
Dr Parker will also head the Mineral Chemistry Unit in the School of Physical Sciences at the new University.
Dr Parker developed the process while at ANU together with Dr D. Muir and Dr D.E. Giles who will also transfer to Murdoch University.
The University has made arrangements for registering a company controlled by the University, to be known as Anumin Pty Ltd, which would enter into an association with industrial undertakings to develop the patented process.
The Vice-Chancellor of Murdoch University, Professor S. Griew, said that Dr Parker would continue his work at Murdoch which could be of great importance to Western Australia and its mining industries.
Dr Parker said the new method involved putting ore into a tank of chemicals. The metal could then be removed from the resulting solution electrically or by other methods. The most promising example had been the extraction of copper from its sulphides, carbonates, and oxides as well as from scrap copper.
Dr Parker gained his PhD from the University of Western Australia and continued his research in Great Britain, Norway and the United States.

THE ANU NEWS.

APRIL 1973 Vol.8. No1.

GOVT. GIVES $150,000 FOR RESEARCH

The W.A. Government has given $150,000 over three years for the establishment of a mineral chemistry research unit at the new Murdoch University.

It is supported by a $15,000-a-year grant for a research fellowship given by Western Mining Corporation.

The unit will be staffed by a team of five scientists from the Australian National University in Canberra.

It will be led by Dr A. J. Parker (39), professorial fellow in the research school of chemistry at the A.N.U., who was recently appointed the first professor of chemistry at Murdoch.

Dr Parker, who delivered the Liversidge Lecture at the A.N.Z.A.A.S. Congress, said yesterday that the new research unit would begin work in W.A. in January and would be located initially in the department of chemistry at the W.A. University.

It would move to Murdoch as soon as the laboratories were ready towards the end of next year.

NEW METHODS

Research carried out at the A.N.U. into new hydrometallurgical methods of processing nickel and copper would be continued at Murdoch.

It was hoped to find new techniques to make processing cheaper and with less pollution.

Research at the A.N.U. had already resulted in a number of reactions that used mixtures of organic nitrites with water as solvents for copper salts, which suggested some very rapid cheap and clean methods of converting copper sulphides to pure copper and sulphur.

These methods would avoid the environmental problems associated with sulphur dioxide emission from copper smelters.

The A.N.U. had applied for patents in 29 countries covering this and other new methods of extracting and refining minerals, and had formed a company, Anumin, in an attempt to encourage Australian development of the inventions.

Dr A. J. Parker

New course on science

The W.A. University extension service has arranged a six-session course to inform physicists, chemists, metallurgists, computer scientists and engineers about new trends in applied science.

The topics cover new power supply systems for the year 2000, the sociological consequences of the extensive use of computers, and new pollution-free chemical and metallurgical processing methods.

The course, which will start on September 18, costs $9.

Sunday paper for Victoria

The Herald and Weekly Times Ltd. and David Syme and Co. Ltd. have agreed to produce a combined Sunday newspaper for Victoria.

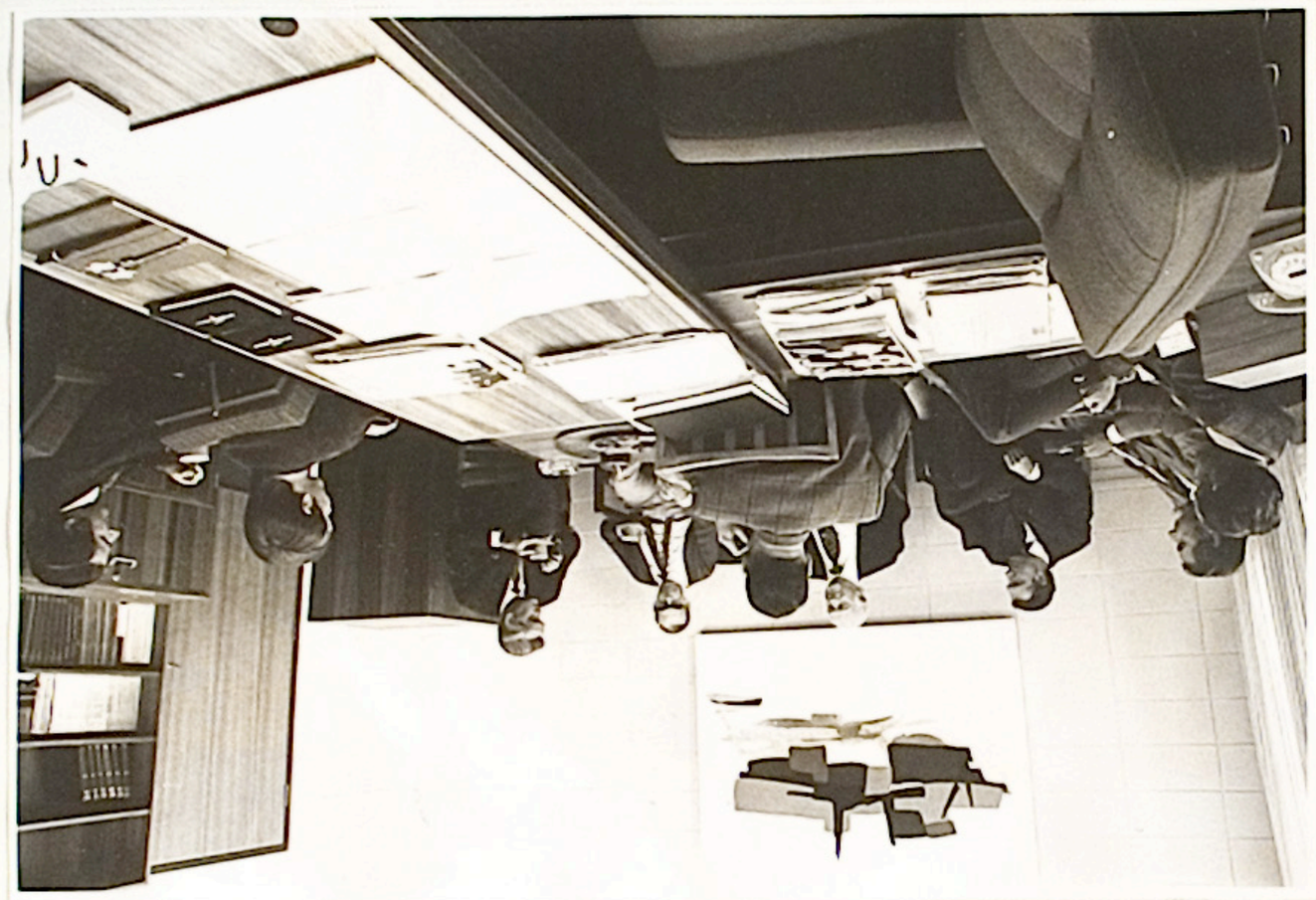
The paper, to be called the Melbourne Sunday Press, will be a popular tabloid, selling at 15c. Its advertising rate will be based on $350 a page.

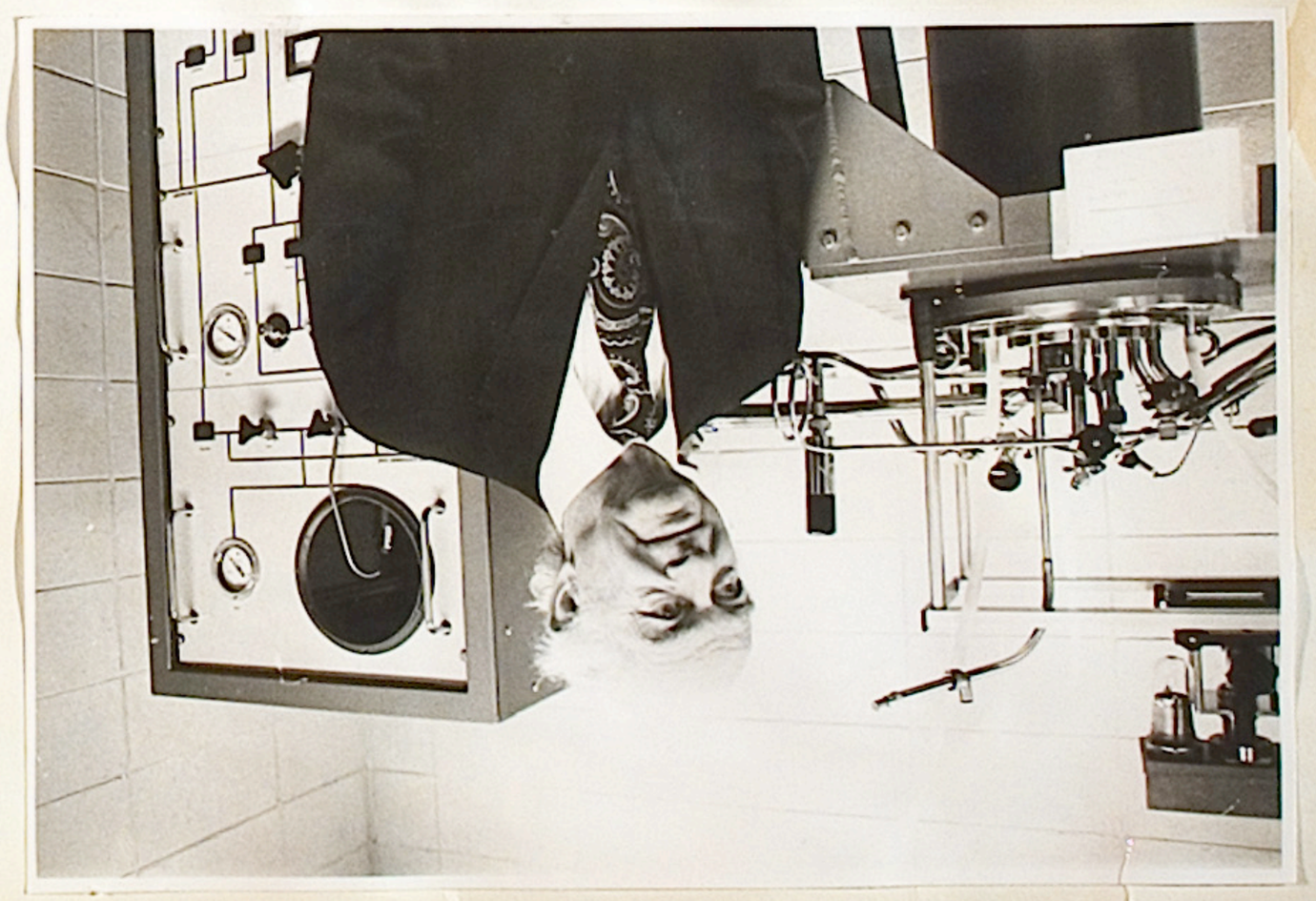
TURNOVERS

PERTH: Industrial 74,182 (Wed. 41,550). Mining 114,503 (122,055). Oil 4,000 (49,800).
MELBOURNE: Industrial 1,399,923 (1,542,833). Mining 717,716 (977,085). Oil 91,271 (294,281).
SYDNEY: Industrial 1,253,846 (1,024,341). Mining 1,051,063 (982,141). Oil 277,913 (203,096).

THE PERTH PAPER.

AUGUST 1973.





Prof Paulings visit
MAY 1973

THE UNIVERSITY WITH A DIFFERENCE . . . II

Second of two articles by GAVIN SOUTER

Sydney Morning Herald
May 11 1973

Inside the non-ivory tower

THERE ARE two pitfalls in writing about the Australian National University. One is that of concentrating on the Institute of Advanced Studies while appearing to ignore the more mundane but by no means undistinguished School of General Studies. The other is describing the institute as some sort of ivory tower.

I am going to fall into the first pit but not the second; and I hope to be excused for the first.

ANU has much to recommend it apart from the research and post-graduate training at the Institute of Advanced Studies.

The School of General Studies produces PhDs of its own, about 35 of them for every 65 from the institute. It is Australia's largest centre for the intensive teaching of Asian languages, and it has broken new ground in such fields as Human Sciences and legal training.

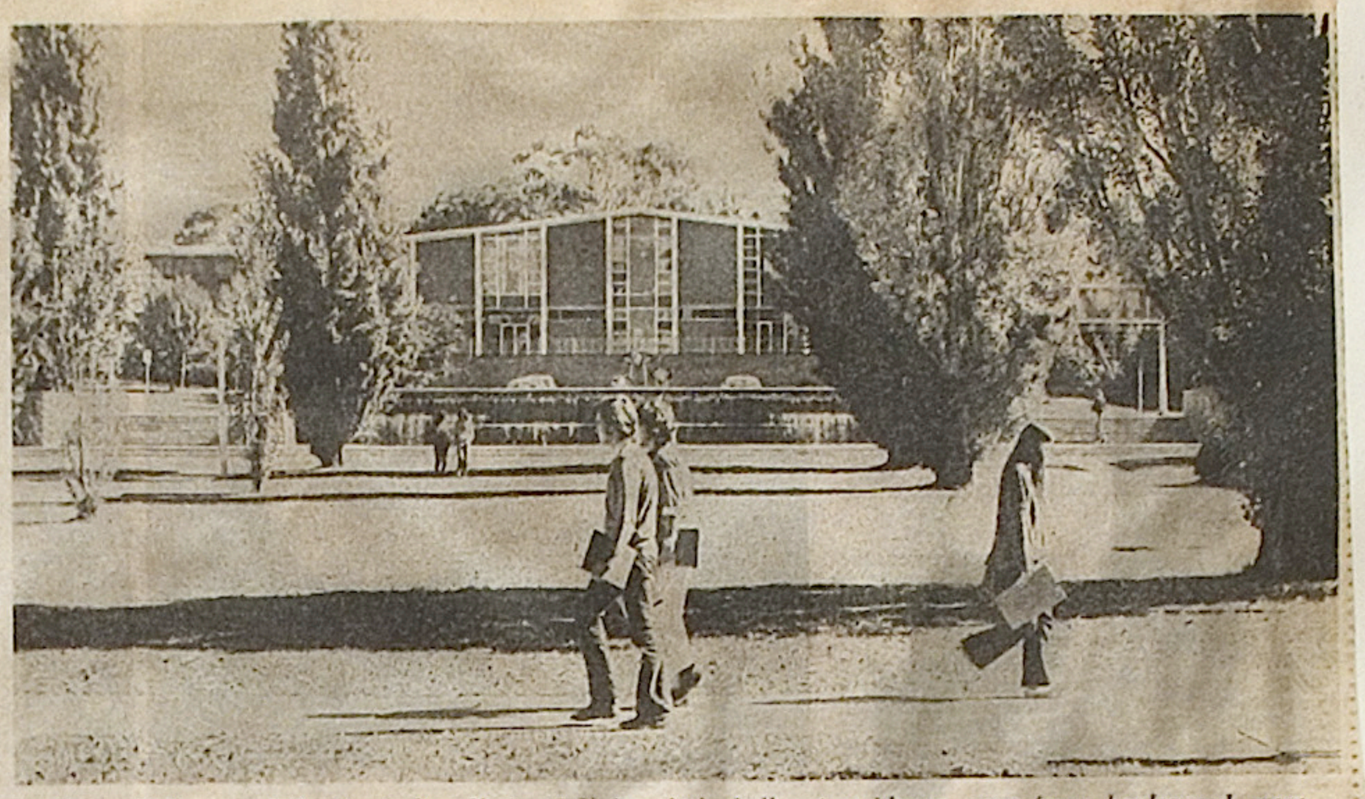
This year the SGS introduced a group of inter-disciplinary courses on Human Sciences as a major in the Faculty of Arts. The courses are Human Biology, Human Ecology and Human Adaptability.

As an alternative to the legal profession's traditional articles of clerkship, the Faculty of Law last year established a very successful Legal Workshop. Largely because of this success, the NSW Law Society has decided to abolish articles from 1974 and set up a legal workshop of its own.

Other notable undertakings at ANU belong to neither the school nor the institute, and sometimes they belong to both. This category includes the new inter-disciplinary North Australia Research Unit, which will draw on the resources of both school and institute; the Creative Arts Fellowships, which bring Australian artists, musicians and writers to ANU for periods of residence with no strings attached; and the Centre for Continuing Education, which conducts seminars and "search conferences" in areas of national need.

One of the main purposes of the Centre for Continuing Education is to help Australians cope with accelerating change. One of its latest ventures is a re-orientation course for Northern Territory Administration officials, aimed at easing their adjustment to the Federal Government's new policy of self-determination for Aborigines.

Having thus briefly given credit to the rest of ANU, one may turn with a clear conscience to the Institute of Advanced Studies. For all the merit to be found elsewhere, it is still the research schools of the institute that make ANU a university with a difference. What is there to report from the non-ivory tower?



Bruce Hall, one of the Australian National University's halls of residence, seen from landscaped areas between the science buildings in University Avenue.

Social sciences

Not surprisingly, there is a strong emphasis here on areas of particular relevance to Australia. The Department of Economics has concentrated on trade, tariffs, income distribution and the labour force; Demography, on post-war population growth and distribution in Australia; History, on Federation and Australian Commonwealth history; Political Science, on Australian politics and administration.

The Department of Sociology is developing a long-range study of stratification and social mobility as two core elements through which it is possible to understand Australian society.

"We are in the middle of a revolution in social-science research," says the director of the Research School of Social Sciences, Professor W. D. Borrie. "The computer has opened up whole new vistas of what can be done by quantitative methods in demography, sociology, education, urban research, economics and even history.

"We are also on the edge of much greater use of social-science knowledge by Governments and others concerned with major aspects of social organisation."

In addition to its nine departments, the school also includes an Urban Research Unit, notable particularly for its careful analysis of the economic processes involved in the development and redevelopment of large cities; an Education Research Unit, whose work has included a study of educational opportunities in relation to social background; and finally a History of Ideas Unit, under Professorial Fellow Eugene Kamenka.

"Kamenka keeps us on our toes intellectually and theoretically," says Professor Borrie.

Medical research

One measure of the volume of research carried out at the John Curtin School of Medical Research since 1948 is its publication record: more than 2,100 major scientific papers and 31 books. Of the 21 Fellows of the Australian Academy of Science now pursuing medical research in this country, nine are at John Curtin.

The Curtin School's most distinguished scientist has undoubtedly been Sir John Eccles, whose work on nerve cells earned him the Nobel Prize in 1963. Its director for the past five and a half years, Professor Frank Fenner, will leave his post this month to set up ANU's new Centre for Resource and Environmental Studies.

The acting-director, Professor Frank Gibson, is a biochemist. "The school is now plateauing towards its final size," he said. "Our three departments still developing are Immunology, Pharmacology and Human Biology. We work on very fundamental problems. Our respiratory work, for example, is done with bacteria."

Physical sciences

There is some doubt about the future directorship of the Research School of Physical Sciences. The director for the past four and a half years—Sir Ernest Titterton, Professor of Nuclear Physics—will reach the end of his term in September. He plans to continue for another term, but last month the university advertised its intention of appointing a director "to succeed Sir Ernest Titterton."

If he is not appointed for another term, Professor Titterton will still have much to occupy him at the Department of Nuclear Physics. The department now has a new $2,200,000 tandem accelerator, the most advanced of its type in the world. This will enable it to take a major part in studying the relatively unexplored field of interactions between heavy nuclei.

The Department of Astronomy maintains observatories at Mt Stromlo and Siding Spring Mountain, where a 150-inch Anglo-Australian telescope is now being built. In the past two years these observatories have become major sources of information about the age of the universe.

Another of the school's eight departments, Geophysics and Geochemistry, will soon be detached and incorporated in a new Research School of Earth Sciences. The director of this school will be Professor Anton Hales, a South African geophysicist who will come to ANU from the University of Texas later in the year.

"Professor Hales is over 60," remarks one senior ANU official with the kind of institutional pride that sometimes ruffles other universities, "—which shows he must be good or we wouldn't be having him."

Chemistry

search is mostly fundamental, but involves Australian flora and fauna. The new director, Sir Rutherford Robertson, FRS, is president of the Australian Academy of Science. Until this year he was Master of University House.

Pacific studies

The new director of the Research School of Pacific Studies is Professor Anthony Low, an Australian historian whose particular interests are Africa and India. He was formerly Professor of History in the School of African and Asian Studies, University of Sussex.

Professor Low wants the School of Pacific Studies to take more interest in Asia, but not at the expense of its original concept: International Relations, Pacific History, Anthropology and Geography in the Pacific-South-East Asia milieu. As a long-range project, he would like to see the school undertake inter-disciplinary studies of South-East Asian peasant society.

The school will soon establish a Department of Political and Social Change, focusing primarily on South-East Asia, second on Eastern Asia, and then on South Asia and Papua New Guinea. Professor Low also thinks that ANU should expand the Contemporary China Centre, which is attached administratively to Pacific Studies.

The New Guinea Research Unit, which has done such excellent work in Papua New Guinea during the past 12 years, faces a changing future.

"I do not think it is on," said Professor Low, "that the major socio-economic research unit of an independent Papua New Guinea should belong to a university of a foreign country. The New Guineans will have to establish their own research unit. Once that is established, we can have all sorts of relations with it. But it must be theirs."

Pacific Studies is probably ANU's most outgoing and practically oriented research school. In the phrase of the new Vice-Chancellor, Dr R. M. Williams, it works close to the fire.

University with a difference

Sydney Morning Herald
May 8 1973.

The first of two articles
by GAVIN SOUTER

LEONARD FRENCH could hardly have chosen a more appropriate subject for his new mural in the dining hall of University House at the Australian National University, Canberra. It is called "Regeneration."

This 30ft-square synthesis of falling and rising life forms — fish, reptiles and birds — would serve at any time as a symbol for Australia's most remarkable university. ANU has always prided itself on change and renewal. It keeps research fellowships relatively short in tenure for the sake of new blood, and it welcomes more academic visitors than all the other Australian universities put together.

In addition to such habitual comings and goings, however, the academic hierarchy at ANU is now undergoing an unusual degree of change. Never before has its taste for regeneration been so fully indulged.

In March Sir John Crawford retired after five years as Vice-Chancellor, and was replaced by Dr Robert Williams, a New Zealand mathematician who was formerly Vice-Chancellor of the University of Otago. Last year there was a new Pro-Chancellor, Mr Justice Sir Anthony Mason; and next year there will be a new registrar. It also happens that the really distinctive part of ANU, the Institute of Advanced Studies, is having a total change of leadership during 1973.

Directors of research schools in the institute are appointed for five years, and normally their terms do not expire together. This year is very much an exception.

Professor Frank Fenner will leave the directorship of the John Curtin School of Medical Research this month to head the university's new Centre for Resource and Environmental Studies. In August Professor W. D. Borrie will retire as director of the Research School of Social Sciences, and in September Professor Sir Ernest Titterton will relinquish, albeit reluctantly, his directorship of the Research School of Physical Sciences. Their successors have yet to be appointed.

Professor Sir Rutherford Robertson took charge of the Research School of Biological Sciences in January, and in February Professor Anthony Low became director of the Research School of Pacific Studies. The only other research school, Chemistry, does not have a director. Its three professors take turns at being dean, year about.

Clearly a new generation of fish, reptiles and birds is on the way up. For this reason it is not a bad time to ask how the ANU experiment has been working. After 27 years of steady, privileged growth, to what extent has this university fulfilled the hopes of its founders and the fears of its critics?

"What is wanted in Canberra," said the late Sir Robert Garran in 1935, "is a university with a difference; something distinctly different, in character and function, from any institution that at present exists in Australia."

That is more or less what Canberra and the nation got. There was nothing unique about Canberra University College, an offshoot of Melbourne University which served the capital from 1929 to 1960; but there certainly WAS about the Australian National University which came into being at the high tide of post-war reconstruction in 1946. There was nothing else precisely like it anywhere in the world.

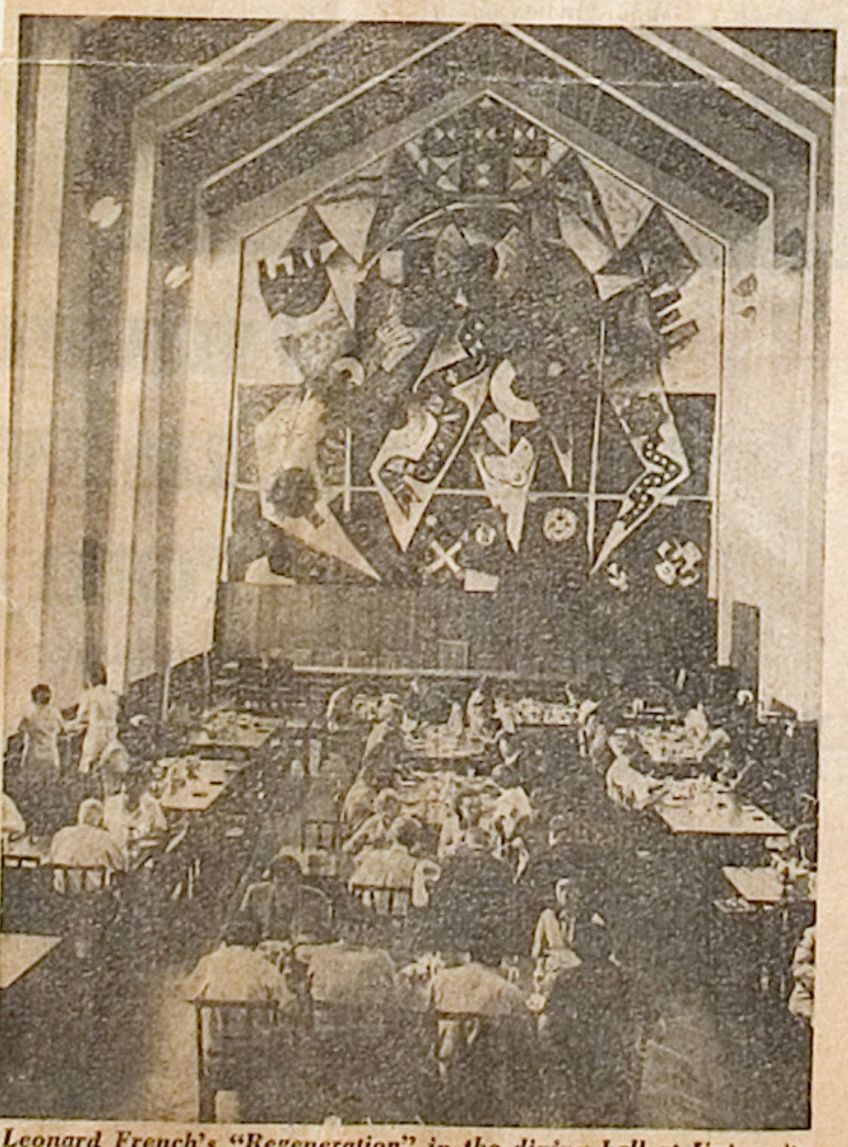
As conceived by such founding advisers and organisers as Lord Florey, Sir Marcus Oliphant, Sir Keith Hancock and Dr H. C. Coombs (now Chancellor of the university), ANU was to perform two basic functions. It was to be a sort of brains trust, conducting high-quality research into subjects of national importance; and, by attracting expatriate academics back to their homeland, it was to help to reverse the Australian brain drain.

In addition to the research carried out in its four initial schools (Medical Research, Physical Sciences, Social Sciences and Pacific Studies), ANU provided facilities for post-graduate but not undergraduate study. At one time it was producing more PhDs than all other Australian universities.

Unabashedly elitist and prodigally endowed, ANU was — and still is, although to a lesser extent than formerly—the envy of more pedestrian universities. In 1960 it was brought partly down to earth by amalgamation with Canberra University College.

"Down to earth" is perhaps invidious. ANU's head may have been in the clouds, but its feet have always been on the ground. Since the amalgamation, it has conformed more to the orthodox idea of a university. But it is still a university with a difference.

The Australian National University is now a confederation consisting of the ineptly named School of General Studies, a sort of "university within a university" which has evolved from Canberra University College, complete with students; the Institute of Advanced Studies, which has evolved from the original ANU into six research schools, soon to become seven with the addition of a Research School of Earth Sciences; and finally, certain other bodies which are neither fish nor fowl, but serve, or will serve, as bridges between the lofty institute and the less rarefied School of General Studies.



Leonard French's "Regeneration" in the dining hall at University House.

The institute absorbs about half the university's income, and the School of General Studies about one-quarter. ANU's staff of about 800 is divided more or less equally between the institute and the SGS.

A State university would need about 10,000 full-time students to justify a staff of that size. ANU has only 5,200 students, about half of whom come from Canberra and its environs.

In terms of students, ANU ranks only tenth among Australia's 16 universities. In terms of expenditure recommended by the Australian Universities Commission, it is the largest of all ($122,265,000 for the 1973-75 triennium).

State academics may today envy ANU its supply of full-time tutors and demonstrators. They may also wonder why professors at the Institute of Advanced Studies receive $1,000 a year more ($16,369) than professors anywhere else, and sabbatical leave at the rate of one year for every four instead of the usual one for seven.

But they have to admit that their own lot has improved too. Capital and recurrent expenditure of all universities has risen from $33 million in 1957 to $1,016 million in the present triennium (annual average, $338-million). ANU's share of expenditure for this triennium ($122 million) is followed closely by those of the Universities of Sydney ($118 million), NSW ($112 million) and Melbourne ($104 million).

After much vigorous expansion during the 1960s (from 1960 to 1967, ANU academic staff numbers rose from 225 to 496, and PhD students from 137 to 468), ANU is now entering a period of moderate growth and consolidation. Its eucalypt-shaded campus at the foot of Black Mountain is now studded with more than 30 buildings, including three halls of residence (Bruce, Burton, Garran) and three residential colleges (John XXIII, Ursula and Burgmann). But the boom has ended.

The Australian Universities Commission has asked ANU to reduce its average cost per student in the School of General Studies. It has also intimated that the University of Adelaide and James Cook University of North Queensland have strong claims for the establishment of research schools to meet national needs.

"The commission believes," its last report said, "that it would be wise to limit the number of research schools at the Australian National University and that there would be advantages in establishing, from time to time, similar national research schools in other universities. . . . The commission would not wish to suggest that no new research school should ever be established at the Australian National University, but it believes that strong arguments would be required to justify the creation of any new school."

Strong arguments are one of ANU's fortes. It has already convinced the commission that it should have a multi-disciplinary Centre for Resource and Environmental Studies, a Humanities Research Centre and a Research School of Earth Sciences. The two centres will help to bridge the gap between the Institute of Advanced Studies and the School of General Studies.

CRES will conduct research into a wide variety of problems relating to resources and the environment. The Humanities Research Centre will bring together, at seminars, Australian academics and overseas scholars distinguished in the humanities.

Other strong arguments will doubtless be advanced in the future. But they will be harder to win. In his valedictory address to the ANU Council, Sir John Crawford, who is now Chancellor of the University of Papua and New Guinea, said: "The School of General Studies faces a tighter but not ungenerous future. It will, like the established research schools, have to accept the fact that some new ventures within the school may be possible only by reducing resources available to established activities no longer so much in demand . . ."

DR WILLIAMS . . . "involved with the issues of the day."

Any measurement of ANU's value to Australia inevitably involves some assessment of the extent to which the university's most distinctive component, the Institute of Advanced Studies, has fulfilled the hopes of its founders.

First, has it helped to reverse the brain drain? From 1960 to 1970, ANU appointed 803 academic staff at Research Fellow or Lecturer and higher levels; 462 of these came from overseas, and 135 of those from overseas were Australians. Nine-tenths of the Australians from overseas have remained permanently in this country.

Has ANU become a "brains trust" of indisputably high academic quality? "I offer no quantitative data on this," Sir John Crawford said. "I can only judge by the growing attractiveness of ANU as a place to work (both to visitors and recruited staff); its clear standing in the publication of scholarly work in and outside Australia; and the growing respect for its members as effective contributors to many public authorities — again both here and abroad."

In quantitative terms, 22 per cent of the 157 Fellows of the Australian Academy of Science are at ANU. So are 35 per cent of the 103 members of the Australian Academy of Social Sciences. Eight ANU professors are Fellows of the Royal Society.

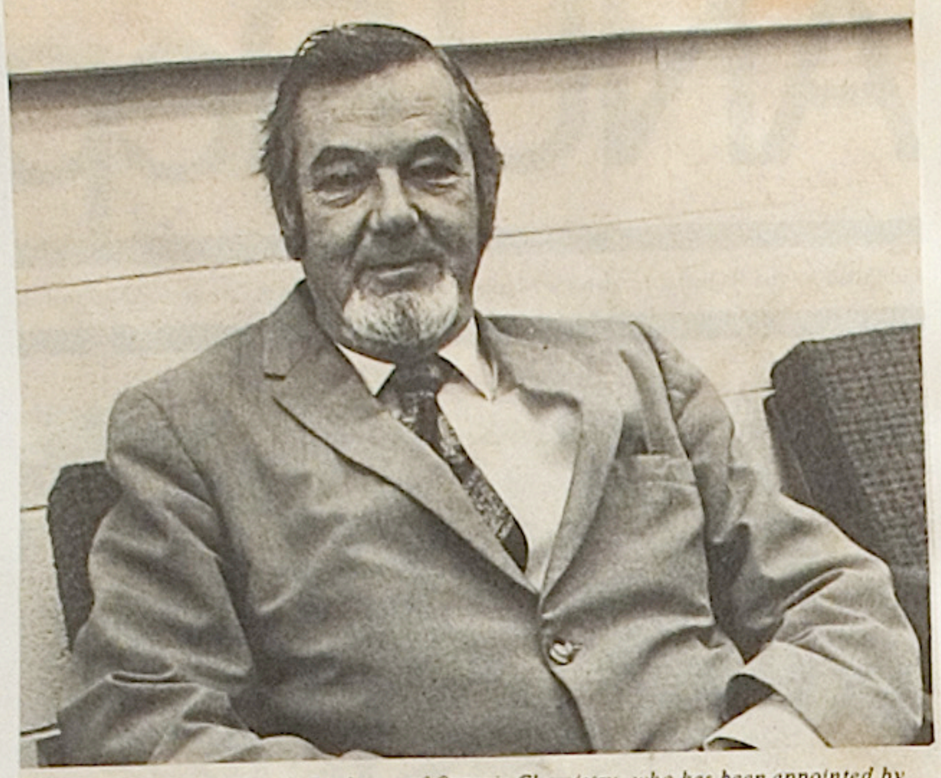
Finally, are the mandarins of the institute addressing themselves effectively to subjects of national importance to Australia? This question will be answered more fully in a second article. The short answer is yes.

Much of the institute's work is pure research, and none the less valuable for that. In other fields its work is of obvious and practical benefit to the nation. One need mention only Professor Borrie's national population inquiry, which is being funded by the Federal Government; Professor Douglas Pike's monumental "Australian Dictionary of Biography"; the New Guinea Research Unit in the Research School of Pacific Studies; and the Urban Research Unit in the Research School of Social Sciences.

Urban research is perhaps the most striking, but by no means the only, example of fruitful contact between the institute and the new Federal Government. This relatively new development has grown out of previous contacts with the Labor Opposition.

"I've been surprised by the number of requests that have passed over my desk already," says the new Vice-Chancellor, Dr Williams. "'Can so-and-so be released on Government work for a day a week, or for the rest of the year?' A national university should in principle be prepared to become involved with issues of the day, which is to say the Government of the day."

Is he worried that such work might be regarded in some quarters as political rather than academic? "We shouldn't ask staff members to be eunuchs," he said. "The university as an institution should be neutral, but individual staff members may sometimes seem to be on the 'wrong' side. If people are clear-headed about it, they should not blame the university if this happens."



Professor A.J. Birch (above), Professor of Organic Chemistry, who has been appointed by Council as Dean of the Research School of Chemistry for three years from 1 August. Professor Birch, who was previously Dean for three years to July 1970, will succeed Professor D.P. Craig, Professor of Physical and Theoretical Chemistry, whose three-year term expires on 31 July. *(Council decision, page 5)*

MAY COUNCIL MEETING (cont.)

are in the University Library.

Following his retirement from the University of Melbourne, Professor Brian Lewis has presented the University with his early drawings and plans of ANU buildings. Professor Lewis was consulting architect to the University from 1947 until 1953.

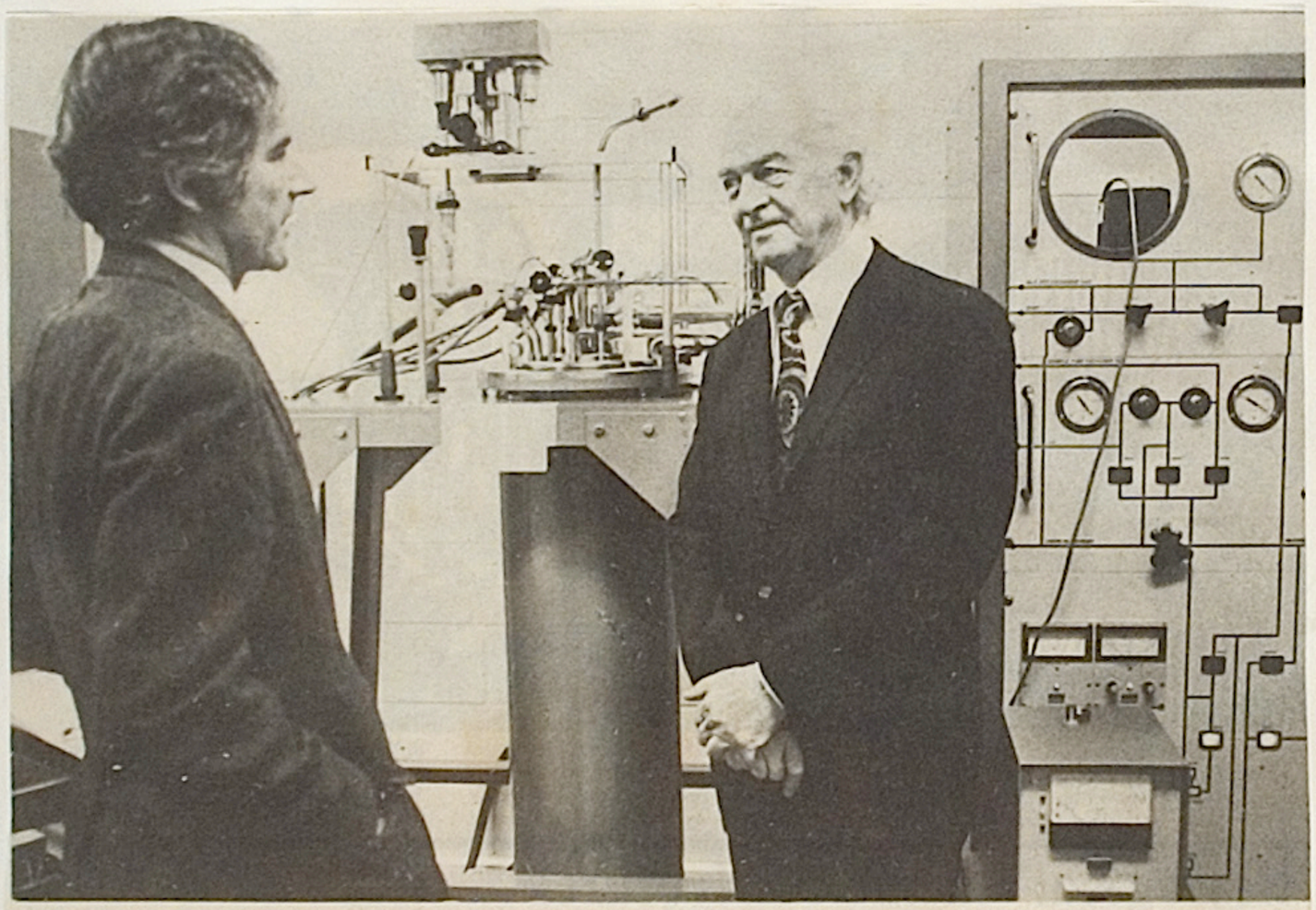
The Taxation Review Committee of the Commonwealth Government has made a grant of $4,000 to support research to be undertaken by Professor S. Turnovsky in the Department of Economics (SGS), and Dr P.J. Lloyd, Senior Fellow in Economics (RSPacS), on commodity taxation in Australia.

Buildings and Grounds Committee. Dr J.J. Dedman was reappointed to the Buildings and Grounds Committee for three years.

RSC Headship. Council appointed Professor A.J. Birch, Professor of Organic Chemistry, as Dean of the Research School of Chemistry for three years from 1 August. Professor Birch, who was previously Dean for three years to July 1970, will succeed Professor D.P. Craig, Professor of Physical and Theoretical Chemistry, whose three-year term expires on 31 July.

In 1970 Council approved the principle of appointment of the Head of the Research School of Chemistry from among the Professors in the school every three years and that the Head should have the title 'Dean'. Each professor in the research school is eligible for the Deanship but each appointment is a matter for decision by Council which is not committed to a system of automatic rotation or particular arrangements for rotation, nor is there any assurance that every professor will be appointed Dean in course of time.

In November last year Council authorised appointment of an electoral committee on the Headship of the Research School of Chemistry. This committee invited views from all academic staff and students in the University, consulted with the faculty board of the Research School of Chemistry and recommended Professor Birch's appointment. In endorsing the recommendation, Council noted that on completion of his three-year term Professor Birch would still have about four years for his own research interests before retirement.



Professor Linus Pauling of Stanford University discusses with Professor R.L. Martin, Professor of Inorganic Chemistry, and Acting Dean of the Research School of Chemistry, the Faraday magnetic balance recently installed in the research school. Professor Pauling, in the early 1930s made major contributions to the understanding of the relationship between magnetism and the architecture and nature of chemical bonds in molecules. The Faraday magnetic balance enables the magnetic properties of tiny amounts of inorganic materials to be accurately followed down to temperatures within one degree of absolute zero and at fields as high as 60,000 gauss. Professor Pauling, a double Nobel Laureate visited ANU 13–17 May as part of his Australian tour, and in the Research School of Chemistry on Wednesday 16 May addressed a very large audience on the topic 'Recent Advances in Orthomolecular Medicine'.

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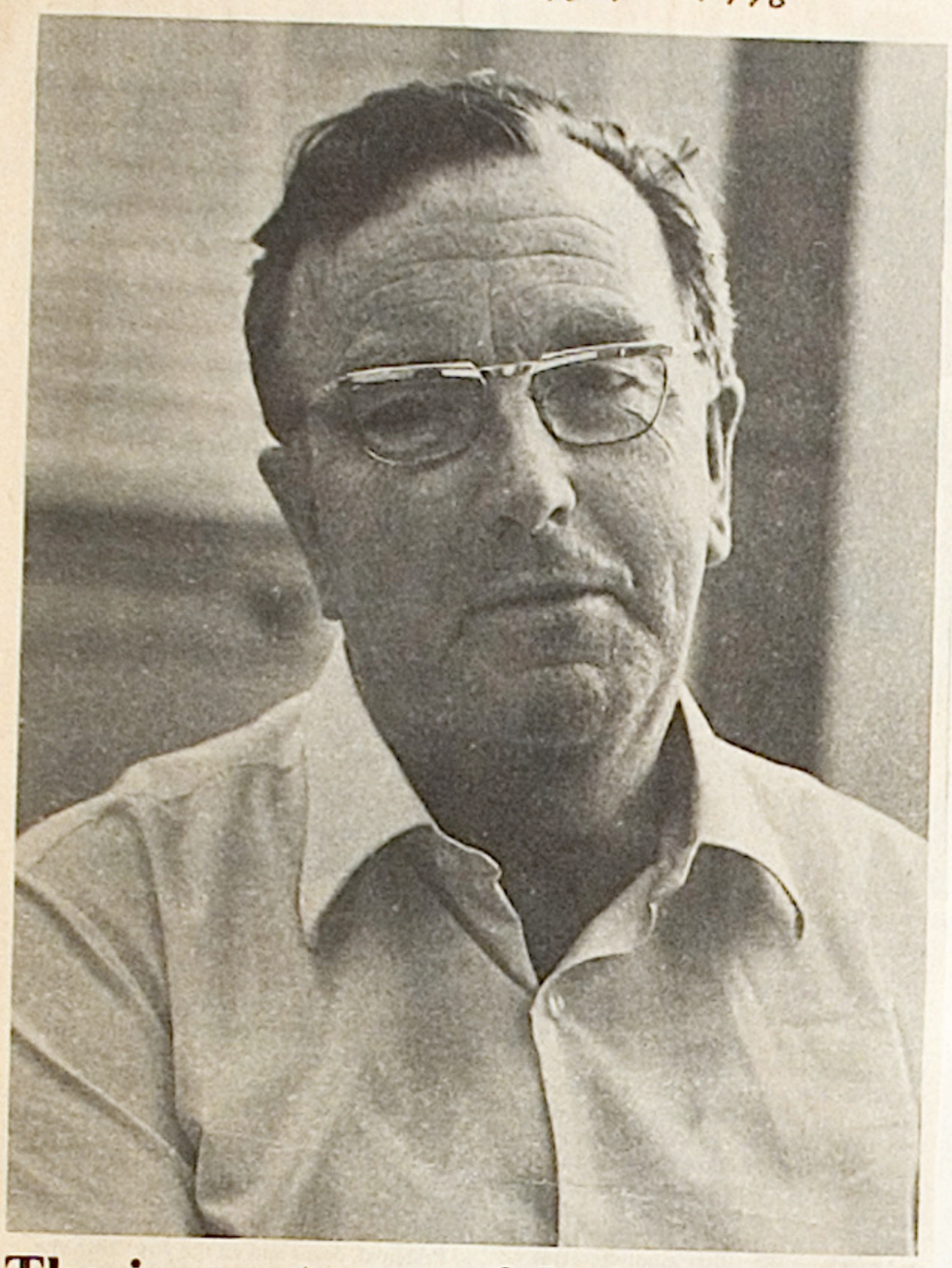
4 ANU REPORTER AUGUST 1973



The importance of being trivial

Dr Duncan Davies (above) believes in the trivial. At any rate, he will be delivering a lecture on 'The Commanding Importance of Triviality' in the Research School of Chemistry lecture theatre next Wednesday, 29 August, at 8pm. And he does not take the subject unseriously.

Or more accurately, this general manager for research and development of Imperial Chemical Industries Ltd. ('I'm a wicked multinational', he grins) does not take the Trivium, from which, through the familiar process of the debasement of English the word 'trivial' has derived, unseriously.

He would like to see this combination of grammar, logic and rhetoric, the basic introduction to mediaeval university studies, or something like it, revived and made a prerequisite for contemporary university courses.

Only after mastering the Trivium, he argues, should students be allowed to go on to tackle such topics as the Quadrivium (the second element in mediaeval studies, comprising arithmetic, geometry, astronomy and music) or its modern counterparts.

'Nowadays, scientists don't know how to describe their work and therefore they are ignored', he says in deploring the absence of a Trivium from contemporary university requirements. The lack is all the more unfortunate, given the extension of grammar and logic to embrace computers.

'You can't do anything without rhetoric', the comfortably-built Celt (derivative, as his name suggests, of both the Scottish and Welsh strains of that race) declares. 'And scientists aren't rhetoricians. Providing you engage in honest rhetoric, you can enrich society . . . Conversation is one of the arts which has been lost'.

Dr Davies is at ANU as an Honorary Fellow, for three months, at the RSC. 'I'm enjoying myself; that's the capacity I'm here in', he told the *Reporter* at one instance. At another he allowed that he also was writing a book.

In addition he has a fairly heavy academic load. On Friday 24 August Dr Davies is to speak, at 10am in the Haydon-Allen Lecture Theatre, on 'Growth and Restraint in Technology'. Next Wednesday is the address on triviality and, the day after, a talk, scheduled for 4.30pm, entitled 'This little idea went to market' (a discussion of the difficulties involved in getting technological innovations off the ground commercially) and, from Monday 3 September, for a week, a series of daily colloquia on research and technology.

Before commencing this schedule, however, Dr Davies has seen something of Australia. He flew last week to Perth, for a slice of the ANZAAS conference, then flew north to Port Hedland, Mt Tom Price and a look at the Ord River scheme.

Dr Davies, an ebullient Oxford D. Phil. in physical chemistry, as well as a multinational executive, occupies an interesting position straddling the world of the natural and social sciences, with the help of his wife, an Oxford historian whose current interests include community development, social history and music.

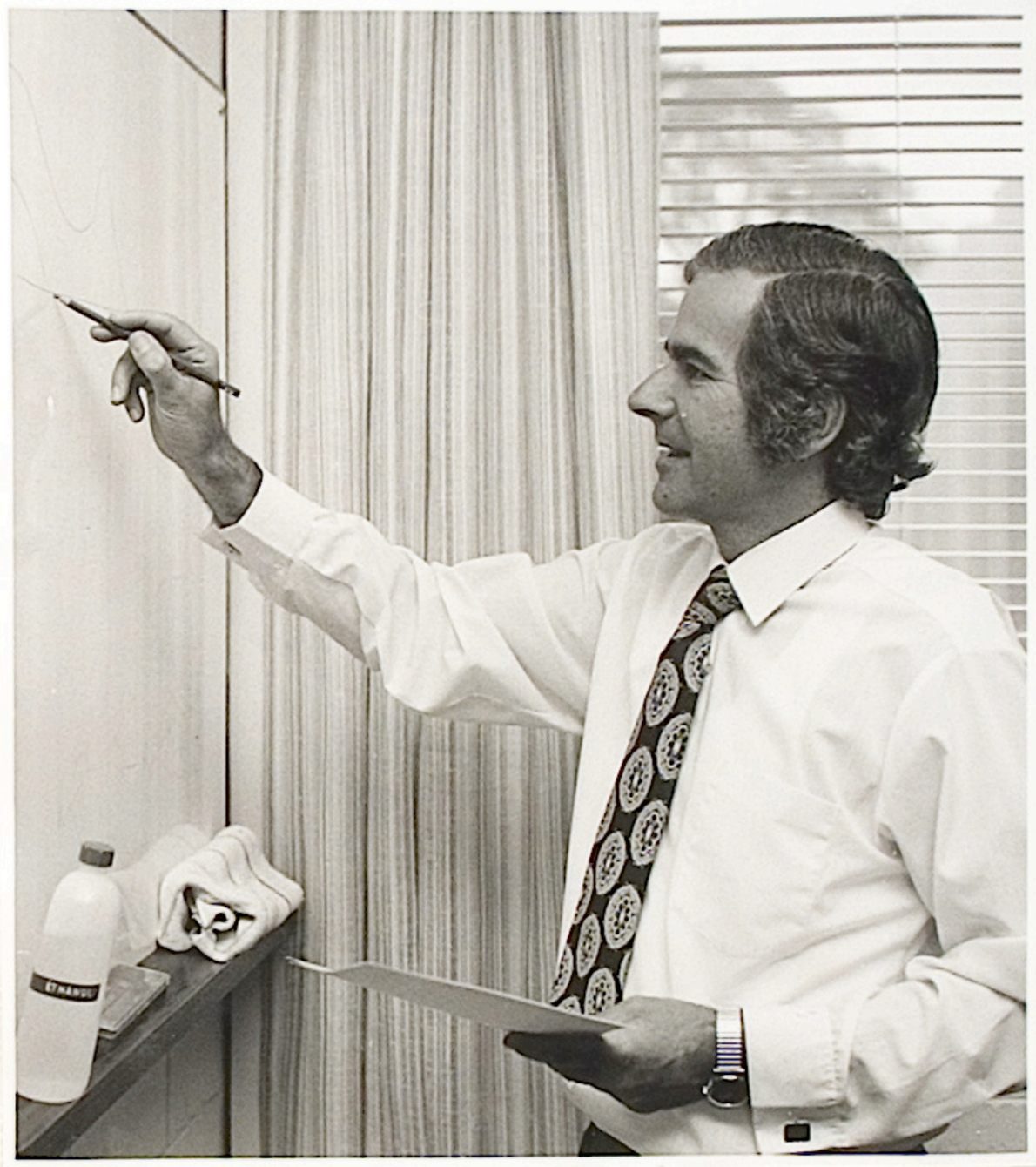
He became interested in the Trivium, and related issues, in 1961, when he was asked to set up a central laboratory for ICI and asked some economists to try to explain their priorities to some of the bright young scientists working for him. They had difficulty communicating. The result was the development of a new, interdisciplinary subject now taught in several British universities, 'technological economics'.

'If academics set about getting things done', he argues, 'when it comes to the business of translating their ideas into progress, this is long, arduous and difficult, and something in which most academics don't have much skill. When they see that after all the world doesn't pick their ideas up, they get plaintive.

'What happens in a university is that you concentrate on the scientific obstacles and usually these are very, very low down on the scale of problems. The real problems are "Is there enough cash?", "Will people say this is injurious to the environment?" and so on'.

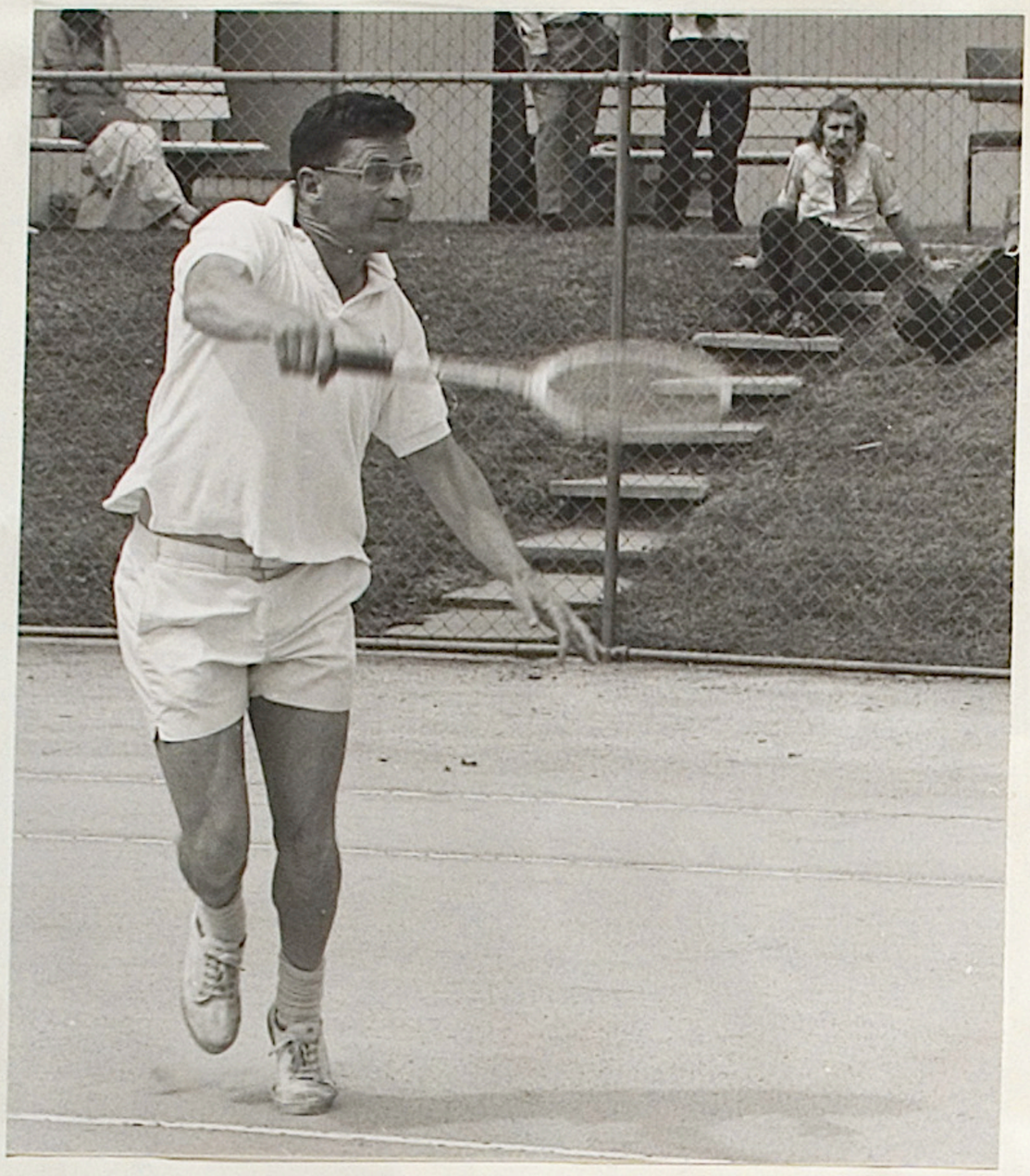
The course in technological economics now being taught at Stirling, Bradford and Ibadan (Nigeria) universities, he said, are turning out graduates 'to be very, very useful in planning and so on. They combine the skills of the scientist and the economist, which is fairly rare'.

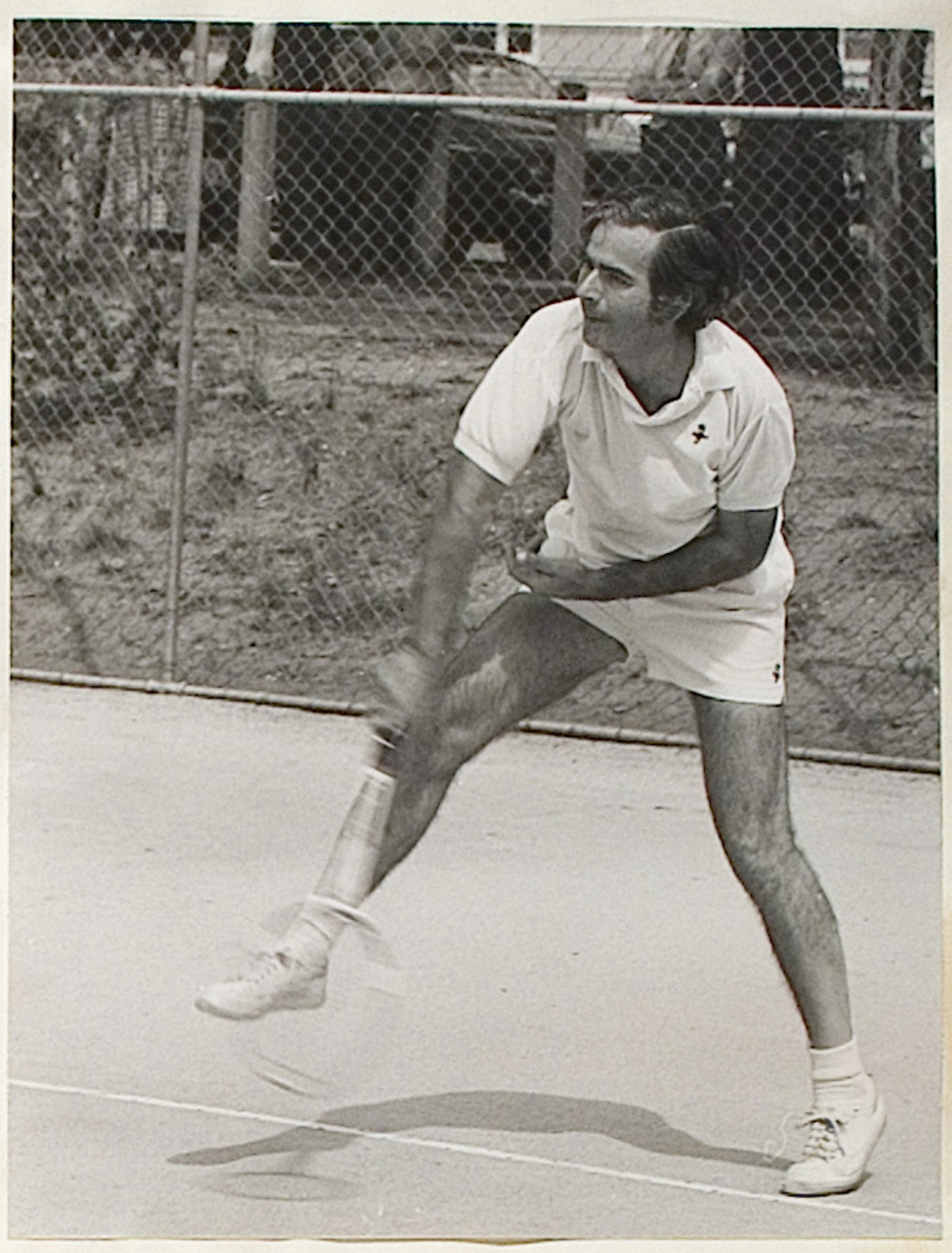
PROFESSOR MARTIN.

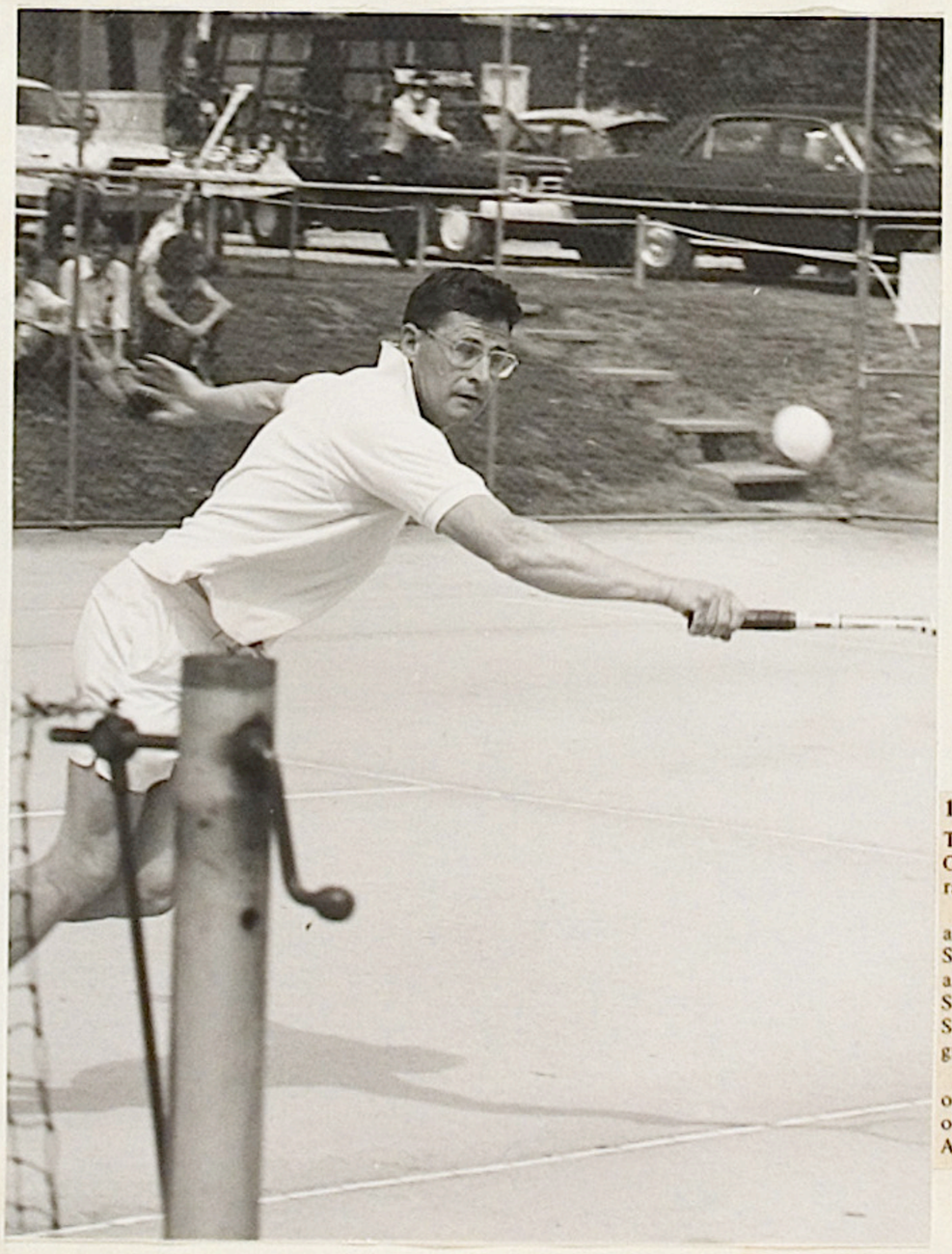


OCTOBER 1973.

ANU TENNIS CHAMPIONSHIPS







ALLAN SARGESON + PROF. MARTIN.

24·10·73.

1973 INTRACAMPUS TENNIS FINALS

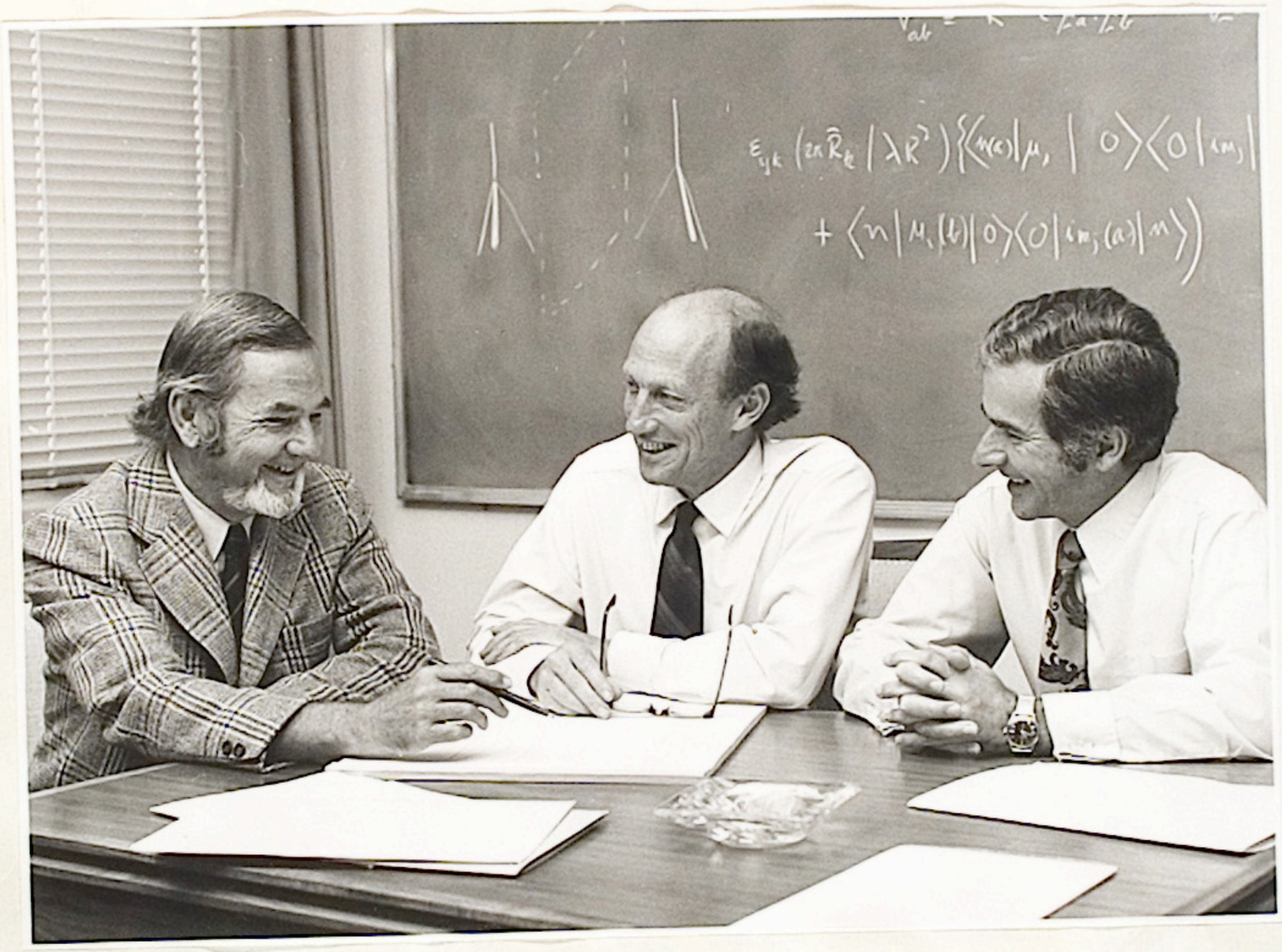
The finals of the 1973 Intracampus Tennis Competition, delayed for a week because of rain, were played on 23-24 October.

In the men's open, Professor Frank Jones and Mr Takeshi Mori (Research School of Social Sciences) defeated Graham Jackson and Warren Muller (School of General Studies) 6-2, 6-4, to win the Ben Simpson Shield, named after the ANU sporting grounds curator.

The A.H. Borrie Shield for the women's open, named after Mrs Borrie in recognition of her contribution to women's tennis at ANU, was won by Vivienne Ubrihien and Ann Pisarevsky (Tennis Club) who beat Janet Hughes and Maxine Davies (Ursula College) 6-2, 6-2.

In the over-40 men's section, Professo Ray Martin and Dr Alan Sargeson (Resea School of Chemistry) beat Keith Roberts and Ron Schmidt (Central Administratio 6-4, 6-0. They were awarded the Joe Burt Veterans Spoon named after Emeritus Professor H. Burton, patron of the ANU Tennis Club and former Principal of the School of General Studies.

The trophies were presented by the Vi Chancellor, Dr R.M. Williams. Seventy-six staff and students from all sections of the University participated in the competitio



26 NOVEMBER 1973.

PROF. A.J. BIRCH PROF. D.P. CRAIG. PROF. R.L. MARTIN.

3 DECEMBER 1973

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