The Australian Physicist
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Message from the President

The appearance of this first number of the first publication of The Australian Institute of Physics will be very warmly welcomed by all its members as further evidence of the vigour of our youthful Institute. The Australian Institute is more than the sum total of the activities of its component groups, scattered widely as they are, throughout the Continent, and this journal will serve to remind us that we are an Australian Institute dealing with a branch of science that transcends State boundaries and that we should concern ourselves not only with our specialist activities but also with the wider social and national implications of our subject.

This new publication is a medium for exchange of information on group activities and for the presentation of scientific and technical articles as well as of surveys of recent advances in areas of science of general interest. It provides a means whereby members can express their views on matters of common concern, as for instance, on the topical subject of Science and Government. Nor should we neglect our grass roots, which lie in the proper teaching of science in the Schools and the smooth transition from School to University. Therefore, I commend the journal to you for your warm support, as being an important new undertaking by the Australian Institute of Physics.

L. G. H. HUXLEY
President

From the Editor

It is with some trepidation that the first issue of "The Australian Physicist" is presented to you. When your Honorary Secretary on February 17 proposed that March 31 should be the issuing date for the first issue, we were tempted to ask which year he spoke of. With the active co-operation of Branch Secretaries, the nominated correspondents, and all-wishers, it has been possible to collect together information which we hope has some measure of interest to members. There are defects — it has not been possible to present articles in this first issue, for example. Nevertheless, this is a defect which will be corrected with assistance from everyone in the Institute.

Australian physicists are not noted for hiding their lights under bushes and with Australia on the threshold of major changes in outlook towards scientific education and research, and towards the applications of science, we trust that you will use these columns to great effect, in discussing your views. We are very aware of the vast distances between the various groups of physicists around Australia. Frequently the affairs of one Branch of the Institute will be unknown to members of another, and the content of lectures given will pass unnoticed except to the few. Articles based on some informative lecture given in one State will provide interesting reading to others elsewhere and lead to a better understanding of the work being undertaken and of the problems involved. The vitality of this journal therefore rests on a great extent on you, its contributors. Your comments will be considered in detail to ensure that we present a representative pattern of ideas and information.

In starting out on this first issue it would be remiss of us not to offer our thanks to the printer who has advised and guided us and done everything possible to compress the time needed for the production of the final article.

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To hold a special meeting of Council would cost the Institute over £200 in fares so it is to be expected that only one or two Council meetings will be held each year and that as far as possible such meetings will be held at a time when the maximum number of Councilors, by some happy conjunction, will be in the same city at the same time on their normal business. Such a conjunction was the Canberra meeting of A.N.Z.A.A.S. — if attendance there can be classed as normal business!

So while others undertook one or more of the varied activities of an evening during A.N.Z.A.A.S. your Council toiled on the affairs of the Institute till late in the night. The summary of some of the business discussed in the four-hour meeting should dispel any doubts that Council meetings are times for catching up on lost sleep.

The meeting was conveniently timed in that newly elected Branch Chairmen had an opportunity of meeting their fellow Councillors and becoming informed on current Institute affairs early in their term of office. Only one Branch — Queensland — was not represented.

Below are summarised the more important items of business discussed at the meeting, not in any particular order.

Appointment of Officers

The following officers were appointed:

Trustees: Mr. F. J. Lehany, Dr. J. S. Dryden.
Returning Officer: Mr. A. J. Higgs.
Scrutineers: Dr. J. A. Roberts, Mr. H. F. Symmons.
Honorary Assistant Registrar: Mr. T. P. Jones.
Membership Committee: Professors C. J. Milner and C. N. Watson-Munro, Mr. F. J. Lehany, Mr. T. P. Jones. The President, Hon. Registrar, Hon. Treasurer and the Hon. Secretary are ex-officio members of this Committee.
Finance Advisory Committee: Members of the Executive.

Representatives of the Institute

The Institute is represented, by invitation, on a number of organizations and committees as follows:

Australasian Institute of Radiography: Mr. J. F. Richardson.
Australian National Committee on Computation and Automatic Control: Dr. F. Hirst.
Australian National Committee on Illumination: Mr. J. Shaw.
National Association of Testing Authorities: Dr. N. Lewis.
Australian UNESCO Committee for Natural Sciences: Mr. W. Swinbank.

Benevolent Fund

At the First Council Meeting it was decided that an A.I.P. Benevolent Fund should be established to render assistance to members, erstwhile members and relatives in case of need. In the past, members of the Australian Branch of the Institute of Physics and the Physical Society have contributed generously to the equivalent Fund and several cases have arisen where the Fund has been of very real assistance to widows of Branch members. The A.I.P. Fund seems assured of equally generous support. Council adopted Rules for the Fund and, in accordance with these, appointed the Benevolent Fund Trustees — Professor H. G. Webster, Dr. A. Walsh, Mr. F. J. Lehany and Mr. A. F. A. Harper.

Biophysics Group

The activity of the Biophysics Group in publishing a quarterly Newsletter on Medical Physics and holding a three-day Annual Conference on Medicine and Biology was noted with approbation. Rules for the Group were approved.

Geophysics Group

Following a move by a number of geophysicists to band together in some form of organization, Council agreed to the formation of a Geophysics Group within the Institute and made a small grant to assist in meeting expenses incidental to the establishment of such an organization. The aims and proposals for the Group are discussed more fully elsewhere in this issue.

Insurance Cover

Members should note that the Institute holds a Public Liability Policy for £10,000 in respect of all Institute activities other than "public demonstrations" and also holds workers' compensation insurance. These policies would be applicable to Branch and Group activities as well as to those associated with the Institute as a whole.

By-Laws

Amendments to By-Laws 27, 72 and 73 were adopted. These relate respectively to subscription rates for Graduates under 25 years, representation on Group Committees and the election of the inaugural committee for a Group. They have already been notified to all members, as is constitutionally required.

Tasmanian Branch

Council hopes soon to have a sufficient membership in Tasmania to justify forming a Branch there. It was suggested that in any case funds might be allocated to provide a special speaker for an Institute meeting in Hobart this year. Over to you, Tasmanians!

Colloquium on Interference and Coherence

The Institute proposes to help defray the expenses of one or more of the overseas scientists attending this colloquium. Details of the colloquium are given elsewhere in this issue.

Teaching of Physics

This matter is of very great importance and interest to the Institute, its Branches and its members. The President has been in correspondence on behalf of the Institute with the Directors-General
of Education in the various States regarding the desirability of common courses for matriculation physics throughout Australia; the W.A. Branch is planning a conference on the subject; representatives of the Queensland Branch have met the Minister for Education on the training of physicists, and the N.S.W. Branch has been in consultation with the Science Teachers' Association. It was agreed that each Branch should be asked to give an opinion on the suitability of the Physical Science Study Committee course for physics to matriculation standard throughout Australia and to consider what practical assistance it can render in its own State in encouraging the study of physics and improving the standard.

Physics Organizations Abroad Published by the American Institute of Physics

At the request of the American Institute of Physics, the entry in this publication in respect of Australian institutions engaged in physical work has been corrected and greatly extended. It is proposed that the A.I.P. accept responsibility for keeping the entries as up-to-date as possible in future editions. The assistance of members in this regard would be appreciated.

Proposed Memorial to the Late Dr. J. L. Pawsey

It was agreed that it would be fitting to commemorate the notable contributions, to physics in Australia and to the formation of the Australian Institute of Physics, made by the late Dr. J. L. Pawsey, whose obituary appears in this issue. A medal or lecture to be presented periodically are possible forms of such a memorial. Other suggestions would be welcomed.

Presentation to the I.P.P.S.

Following discussions with officers of the I.P.P.S., it has been agreed that the Institute would present to the British body, as a token of the Institute's appreciation for its work in Australia, a writing table and four occasional tables for use in the Members' Reading Room in the Institute and Society's rooms in London.

The timber (Australian red bean) has been selected and Council had before it suggested designs for the furniture. These included a matching design for a chair for use with the writing table, which the President had indicated he wished to present. It was agreed that if the designs were acceptable to the British body the construction of the furniture would be put in hand.

FINANCE

The Honorary Treasurer reports that, at the end of the first year of operations, the A.I.P. had a small surplus of receipts over expenditure amounting to about £335.

In the current year, the amount available to the six Branches for their normal activities is £632. The trust account holds £3295, most of which is actually credited to the Branches which have held successful exhibitions. The amount at credit in the Benevolent Fund is approximately £250.

A number of members of A.I.P. when sending their subscriptions have included membership subscriptions to the Institute of Physics and the Physical Society although they are not members of that organization. It must be emphasized that membership of A.I.P. does not confer automatic membership of the London organization. Members who have made this error will be advised individually in due course and their excess payment credited to their future subscriptions.

MEMBERSHIP

At March 31, 1964, the total membership of the Institute was 657, made up of 576 corporate members (Fellows, Associates, and Graduates), 70 Students and 11 Subscribers. This corporate membership is already greater by 113 than the corporate membership of the former Australian Branch of I.P.P.S.

The rules of the Institute provide for Council recognizing the degrees and diplomas in physics of particular universities and technical colleges as satisfying the academic requirements for Graduate membership of the Institute. Council already has recognised the B.Sc. degree of all Australian and New Zealand universities as well as all those degrees accepted for the purpose by the I.P.P.S.

At its recent meeting, Council added the Fellowship Diploma in Applied Physics and also in Applied Physics (Meteorology) of the Royal Melbourne Technical Institute to the list of acceptable qualifications.

An applicant for membership who does not hold a degree recognised by Council is not, of course, precluded from becoming a member. In such cases, his qualifications have to be assessed individually.

FORMATION OF A GEOPHYSICS GROUP

On January 21, 1964, in Canberra, a meeting was called to discuss the desirability of forming a society or group for geophysicists in Australia. The meeting, with Mr. J. M. Rayner in the chair, was attended by some 40 geophysicists. At the invitation of the convenors, the A.I.P. was represented by Mr. A. F. A. Harper, Mr. G. A. Bell and Dr. J. S. Dryden. The answers to a questionnaire which had been circulated previously were summarised at the meeting. Although the answers showed a considerable divergence of opinion, the majority favoured a specialist Group within the Australian Institute of Physics. Eventually a motion was carried, requesting that the Institute form a Geophysics Group. At the Second Council Meeting held the next day, it was resolved that a Geophysics Group be formed and some funds were made available to the Interim Committee for expenses incidental to the establishment of an organization of geophysicists, whether it remains a Group of the A.I.P. or takes some other form. An Interim Committee (with power to co-opt) was duly nominated and elected.

The first meeting of the Group Interim Committee was held in Melbourne on 19th February, and the members were as follows:

J. C. Dooley (Chairman)—Bureau of Mineral Resources.

W. D. Parkinson (Secretary)—Bureau of Mineral Resources.

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Dr. J. L. Pawsey

Dr. Joseph Lade Pawsey, Assistant Chief of the C.S.I.R.O. Radiophysics Laboratory, died in Sydney on November 30, 1963, at the age of 54, after a long illness. Dr. Pawsey was one of the pioneers of radio astronomy, and his stimulating leadership of the Australian work in this field for 17 years gained him a high international reputation.

After graduating at the University of Melbourne, Dr. Pawsey was awarded an 1851 Exhibition Scholarship and proceeded to the Cavendish Laboratory, where he worked under Lord Rutherford.

Following a period in which he was associated with the development of the first television equipment at the Alexandra Palace in London, Dr. Pawsey spent the wartime years in Sydney, working in the field of radar.

In 1945-46 he made some of the important early discoveries in radio astronomy, and from that time he was closely connected with all the Australian work in this rapidly expanding subject. He had a remarkable ability for getting immediately to the essential physics of a problem, and a special flair for developing ingenious solutions to the major technical problems in this field. He has left behind a strong group of radio astronomers in Australia, and his influence will be felt for a long time to come.

In December, 1961, Dr. Pawsey was invited to become Director of the National Radio Astronomy Observatory at Green Bank, West Virginia, and proposed to take up this appointment late in 1962. It was during a preliminary visit to Green Bank in March, 1962, that he first became seriously ill.

Dr. Pawsey was a Foundation Fellow of the Australian Academy of Science and a Fellow of the Royal Society. He was a long-standing Fellow of the Institute of Physics, and was a strong supporter of the Institute throughout his professional career. In recent years, he was actively concerned with the moves which led to the formation of the Australian Institute.

Dr. S. H. Bastow

Stewart Henry Bastow died on 23rd January at the age of fifty five. He died as he would have liked to, in the middle of an activity he cherished; playing Royal Tennis in a tournament.

Educated in Melbourne, Hobart and Brisbane he studied Physics and Chemistry at the University of Tasmania from 1924 on. He was a Demonstrator in Physics in 1927 and carried out research with Professor A. L. McAulay on the Electrical Behaviour of Surfaces of Corroding Iron, a
project undertaken for C.S.I.R. In 1929 he went to Kings College, Cambridge, where he worked first with Professor E. K. Rideal on Catalysis at Low Temperatures and in High Vacuum and then with Dr. F. P. Bowden on physical properties of surfaces. He was awarded a Ph.D. and in 1932 the Senior 1851 Exhibition for Physical Chemistry.

From 1934 to 1937 he was with National Enamels Ltd. and South Metropolitan Gas Co. and then with the Anglo-Iranian Oil Co. until 1940. Both firms were concerned with processes which were imperfectly understood and programmes of fundamental research had to be initiated to overcome the technical problems. This initiation of a research programme and the translation of the results into practice were just the type of thing Bastow liked. The Bastow method for control of properties of mud for oil well drilling was still being used by the Anglo-Iranian Oil Co. when they were forced to leave in the early fifties. During the two years in Iran he also prepared a photomicrographic atlas of the rocks of Iran.

During the war he was first commissioned in the Royal Engineers and later appointed Technical Officer with the rank of Major. He took part in the invasion of Europe and was awarded the D.S.O.

In 1945 Dr. Bastow returned to Australia to take over the Section of Lubricants and Bearings of C.S.I.R. At his instigation the name of this group was changed to Tribophysics. In 1947 the Section was elevated to a Division with Dr. Bastow as its first Chief. In May, 1949, he became a member of the Executive of C.S.I.R.O. During these three years he wound up the war-time projects, formed a group studying the physics of metals and initiated work on chemical reaction kinetics, thermal conductivity of organic vapours and viscosity of bentonite suspensions. This last project was of importance to oil well drilling and Dr. Bastow went to Papua in 1947 to advise the Australian Petroleum Company. The planning of the new laboratory for the Division in the Grounds of the University of Melbourne was due to him.

It was Dr. Bastow's personality which held the Division together in those years of accommodation in army huts and endless delays in the delivery of equipment. With his charm he steered the Division through those frustrating times and encouraged the staff by his example. Just as during the war he would never ask from those he led anything he would not do himself. He gave up a part of his office to make room for a laboratory and his personal modesty was evident in his renouncing much of the comfort usually enjoyed by heads of laboratories. As a Member of the C.S.I.R.O. Executive his interests in seeing scientific results used in industry led him to contribute considerably to the development of science and industry in Australia.

As he was unpretentious himself he would not stand pomposity in others and by asking them "why?" at the critical points reduce them to a more normal level. He was courageous both physically and intellectually and would not hesitate to expose any dishonesty.

That side of his character which probably gained him most friends and made him so popular was his human understanding and his interest in other people. Even when he was very busy as a Member of the Executive he would find time to listen to the grievances and worries of the staff at any level and help them with his wisdom and kindness. He was a lovable man.—W. Boas.

**The Australian Physicist**

_Suggestions To Contributors_

Manuscripts submitted for publication should take, in general, one of three forms:

(a) An article on matters affecting physicists, including selected lectures given at Branch or Group meetings.

(b) A Letter to the Editor in which matters affecting physicists are discussed. Views of members on articles and letters previously published may also be expressed in a letter to the Editor. In general, letters should not exceed 1,000 words, and figures and tables should be used sparingly.

(c) News and Notes may include Institute activities, announcements to members, comments and announcements by overseas institutes of Physics and other local scientific bodies. The text will be short; in general, it should not exceed 400 words.

Where possible, contributors should prepare manuscripts in a form suitable for sending to the Press. Manuscripts should be in double-spaced typing, on one side of the paper only, and with one and a half margin margins. For an article, the author's name and the address of the laboratory should appear underneath the title. For a Letter to the Editor, the author's name should appear at bottom right, and his address and the date at bottom left of the letter. A suitable heading should be proposed for letters, and news and notes.

All pages should be numbered, including those with tables and illustrations.

Standard for spelling: _The Concise Oxford Dictionary_.


References should be cited in the text by year of publication, e.g., Brossel (1947), and are to be arranged alphabetically at the end of the article, giving author's name and initials, followed by year of publication, title of paper (if desired), title of periodical, volume and pages, thus:


Abbreviations of titles of periodicals should conform to those used in _A World List of Scientific Periodicals_. References to books should give author or editor, year of publication, number of edition, town of publication, and publisher's name. Symbols and abbreviations should conform with those recommended in _British Standard 1991: Paris 1-5: 1953-61_.

THE AUSTRALIAN PHYSICIST, APRIL, 1964 7
THE UNIVERSITY STAFFING PROBLEM
IN PHYSICS

In Australia at present new universities are growing rapidly, still more are planned, and the older establishments continue to expand to some extent. This extension of our universities is necessitated by the increase in Australia's population and by the tendency for a larger proportion of young people to seek tertiary education. Buildings and equipment are needed but any expansion must ultimately be determined by the availability of qualified staff. There is reason to doubt whether a sufficient number of physicists will be available to supply the staff needs of Australian universities in the next few years.

Recently, I spent many hours talking about this problem with physicists both young and old in Europe and the United States of America. It became evident that the projected expansion of universities in the United Kingdom would present serious staff problems there and that, in the United States, there is certainly no surplus of suitable manpower. There seems to be a worldwide shortage of highly qualified physicists.

The important question is whether Australian universities are sufficiently attractive to compete successfully in this limited physics staff market. My very strong feeling is that, in general, they are not. There are a number of ways in which Australian university physics departments suffer when compared with institutions abroad.

Firstly, the facilities for research are often limited. At a rough estimate, Australian budgets for recurrent expenses are about half as large as those in England and perhaps one-tenth as large as those in America. Grants for major items of equipment are more readily obtainable abroad. In addition, it is relatively easy for the staff of overseas universities to gain access to national laboratories with equipment worth tens of millions of pounds. Few comparable facilities exist in this country.

The provision of technical staff to assist with research is more liberal overseas and, at least in America, more realistic salary scales result in technical officers of a superior quality.

The isolation of Australia from other centres of learning is a serious disadvantage, particularly in a fast-moving subject such as physics. The international conference now competes with the learned journals as a mechanism for disseminating information. Australian universities find it extremely difficult, and often impossible, to provide adequate funds for staff members who should be attending overseas meetings. The lack of representation at important conferences can hamper the research effort of universities and it creates a very bad impression abroad.

The deficiencies mentioned above all relate to research and there are some who will debate the place it should occupy in universities. Without entering the lists, it seems fair to emphasize that people considered qualified to teach in universities usually want to do research. If Australian universities cannot provide the necessary climate, such people seek employment elsewhere.

Whether Australian university salaries are adequate is debatable, but a more important issue is the question of promotion. The policy of limitation of senior positions by establishment seems designed to ensure that the number of first rate people in universities should remain small. Such policies make it difficult to attract good men from abroad and can seriously limit the breadth of outlook in a particular department.

Finally, university statistics look alarming when viewed from abroad. Australian staff to student ratios are much smaller than those accepted as reasonable in reputable overseas universities. This conjures up pictures of intolerable teaching loads. The inference may not be true, as there is reason to believe that the low staff to student ratio implies less teaching per student rather than more hours per staff member. The ratio of postgraduate to undergraduate students is also adverse and it is easy to construe this as due to lack of interest in research. Whether the inferences are true or not, the statistics look bad and they adversely affect the recruitment of staff.

All these things combine to create a poor impression of Australian universities at a time when if they are to be adequately staffed, it is essential that their reputations be at least comparable with those of overseas institutions. The only solution to the staffing problem is the provision of financial support for physics departments on a greatly increased scale. It is unlikely that this support can be obtained through the normal university financial channels and it would seem that the most satisfactory source of supply might be Federal Government Agencies charged with the fostering of scientific effort in Australia. Unfortunately, the agencies which already exist require most of their limited funds to support their own activities and, in consequence, they provide only token sums for university research.

The training of physicists is, or should be, the concern of the profession as a whole and it would be appropriate for the Australian Institute of Physics to step into the arena at this time. If our universities are to be effective they will need realistic support very soon. If nothing is done there is a very real risk that the quality of our graduates will decline as rapidly as their numbers increase.

D. E. CARO

Department of Physics, University of Melbourne, Parkville, N.2, Victoria.
The Institute of Physics and the Physical Society
New Zealand Branch

We have just received a report of the first year of activity of the New Zealand Branch of the Institute of Physics and The Physical Society. Apart from our natural interests in the doings and welfare of our brother physicists across the Tasman, our two bodies are linked in the sense that the New Zealand Branch of the I.P.P.S. may be regarded as having risen phoenix-like from the ashes of the Australian Branch, as it held its first meeting just a month after the dissolution of the Australian Branch.

The Australian Branch had previously acted as the fee-collecting body for I.P.P.S. members in New Zealand and when the move to form a Branch came we gave help in a small way with advice and finance.

The first Chairman of the Branch is Mr. W. H. Ward, F.Inst.P., Director of the D.S.I.R. Dominion Physical Laboratory.

With the formation of the Branch, membership of the I.P.P.S. in New Zealand has jumped from 37 to 65. A Division has been formed in Wellington (membership 24) and it is hoped soon to form another in Auckland (16). The new Branch quickly found itself co-operating with other scientific bodies in discussions which could be of great moment to New Zealand science, resulting from Governmental action to set up a National Research Advisory Council to advise a Minister for Science. From the Branch’s Report, it would seem that the Branch Committee is not very happy with some of the functions which this Council is expected to perform and considers that an enquiry into science in New Zealand (which it presumably thinks is needed) will be prejudiced by the setting up of the new Council.

We wish the New Zealand Branch well and believe it is assured of filling a useful and indeed a necessary place in the local scientific community.

Symposium on “Probability Theory and Applications”

The Statistical Society of Australia (New South Wales Branch) is holding a symposium on the above subject on May 27-29, 1964, in the Peter Nicol Russell Lecture Theatre at the University of Sydney: further details from R. A. Layton, School of Economics, University of New South Wales.

Conference on Interference and Coherence

A conference on Interference and Coherence will be held at the University of Sydney in August of this year. The meetings will be in the School of Chemistry on the 25th and 26th while visits and tours are being arranged on the 24th, 27th and 28th.

The Conference is being held under the auspices of the International Commission for Optics and is being sponsored by the Australian Academy of Science, C.S.I.R.O., and the Institute. It has been arranged in conjunction with a conference on Photographic and Spectroscopic Optics to be held in Japan on the 1st-8th September and it is anticipated that a large number of optical physicists will take the opportunity to visit both countries. At present about 50 overseas participants are expected.

The International Commission for Optics (I.C.O.) is an Affiliated Commission of the International Union of Pure and Applied Physics (I.U.P.A.P.). Through this Union, it is affiliated with the International Council of Scientific Unions and so receives U.N.E.S.C.O. assistance towards conferences. Countries join the I.C.O. through their National Committees for Optics: this is a separate affiliation to that to I.U.P.A.P. The I.C.O. was established in 1948 and has held since then international conferences in optics roughly annually, with a full meeting of the Commission every three years. Apart from the 1956 meeting, the Australian and Japanese conferences are the first held outside Europe.

Australia’s affiliation with the I.C.O. was recommended by the “Conference on Contemporary Optics” organized by the Australian Branch of the Institute of Physics in Sydney in 1956. The first meeting of the Australian National Committee was held following the “Second Conference on Contemporary Optics” in Melbourne in 1959. The present international conference is thus a true successor to the two earlier conferences organized by the Institute.

Invited papers are to be given by Dr. E. J. C. Engelhard of the Physikalisch-Technische Bundesanstalt, Braunschweig, Professor Emil Wolf of the University of Rochester, and Professor R. Hanbury Brown of the University of Sydney. Under negotiation are talks by Professor A. C. S. van Heel of Delft, Professor R. Chaball of Paris, and a talk on interferometers in radioastronomy.

About 20 short contributed papers will be presented. The scientific sessions will be held on the Tuesday and Wednesday, 25th and 26th August. On the 24th, a visit will be arranged to see the optical work at the National Standards Laboratory and participants at the conference may register on that day. A registration fee of £4 will be charged; this will include the conference dinner on the Tuesday evening. Students may attend the meetings for £1.

After the meetings, a tour is being arranged by chartered plane to visit the Parkes Radiotelescope, and, at Narrabri, the Intensity Interferometer and the Radioheliograph. This will last 1 1/2 days and cost about £20 in all. As an alternative, a second tour may be organized to Canberra (and Mount Stromlo Observatory) and Melbourne.

It is planned that the bulk of the visitors, interstate or overseas, will be able to stay at Women’s College. The charge for single rooms is £2/12/6 a
day, all meals included. For those wishing double rooms or slightly better accommodation, the University Lodge Motel will be available.

The second circular for the conference should be available soon, giving details for registration. Copies will be sent to Branches of the Institute and to main Physics Laboratories. Full details may be obtained from the Organizing Secretary, Dr. W. H. Steel, National Standards Laboratory, Chippendale, N.S.W.

Exhibition of Scientific Instruments and Apparatus

The N.S.W. Branch of the Institute is organizing an Exhibition of Scientific Instruments and Apparatus to be held from Tuesday, August 18 to Friday, August 21, 1964. As previously, the University of Sydney has given permission for the exhibition to be placed in the laboratories of the School of Chemistry. Previous exhibitions have all been a great success both for the exhibitors who were able to adequately display their equipment, and for the scientist who was able to see a wide range of new instruments in the space of a few hours.

Further details may be obtained from the Exhibition Organizer, Dr. J. C. Kelly, School of Physics, University of New South Wales, Kensington, N.S.W.

The Association of Professional Scientists of Australia

The Council of the Australian Institute of Physics has agreed to publish the following statement issued by the General President of the above Association:

The Association of Professional Scientists of Australia (A.P.S.A.) was registered as an organization under the Commonwealth Conciliation and Arbitration Act in November, 1962. This entitles the A.P.S.A. to appear before the Arbitration Commission on behalf of all scientists employed in industry, and in this jurisdiction this means all scientists employed in private industry and the Commonwealth Public Service. Many scientists employed in the State Public Services are also eligible for membership, although we cannot directly represent them before the State Public Service Boards. However, our activities in other fields will undoubtedly assist them. Teachers, and this in law also means University staff, are not eligible for membership of the A.P.S.A.

Briefly, our immediate aim is to secure an award for scientists similar to that gained by the Association of Professional Engineers, Australia, in 1961. Since our registration we have been heavily involved in negotiation and arbitration, and we urgently need support. The field of industrial negotiation is complex and sophisticated and a capable full-time industrial and research officer ensures smooth and impersonal negotiation. Our present membership is not sufficient to support a full-time officer; even so, our progress so far has been most encouraging.

From the above, you can see that our activities do not overlap those of the A.I.P., and in fact the organisations are complementary. The basic qualification for membership of the A.P.S.A. is a B.Sc. of an Australian University or its equivalent. We rely on the learned societies such as the A.I.P., to set the standards and their minimum standards are adopted by the A.P.S.A. In the event of a dispute over the value of qualifications both employer and employee will rely on the A.I.P. to be the arbitrator. The A.P.S.A. is anxious to maintain academic standards and professional conduct in every sense.

We believe that every practising physicist should belong to both the A.I.P. and the A.P.S.A. as a matter of course, so that he has a voice in the conduct of the two bodies which vitally affect the status and well-being of his profession and its members. The Council of the A.I.P. has generously allotted this space to enable the views of the A.P.S.A. to be put before you. In due course, you will receive a copy of the Rules and Constitution of the A.P.S.A. and a form of application for membership of the Association, and we strongly urge you to make an immediate application for membership. Applications for membership accepted after 31st December will only require the payment of £4/4/0 subscription to make the member financial until 31st December, 1964.

For the information of members of the A.I.P., the Committee of Management of the A.P.S.A. for the year 1963-64 is comprised of the following persons:

General President: Dr. P. R. Wilkinson, Ph.D., A.R.A.C.I., Senior Research Chemist, IGIANZ Ltd., Central Research Lab., Ascot Vale, Vic.

General Secretary: Mr. W. I. Wallbran, M.Sc., A.R.A.C.I., Senior Chemist, Victoria Department of Agriculture.

A.C.T. Branch

Due to the coming extended absence overseas of the elected chairman, Dr. A. R. Hogg, the acting chairman will be Sir Frederick White, who will also act as proxy for Dr. Hogg at Council meetings.

The A.C.T. Branch has been rather small in number since formation and at the present time totals only about 30 members. A publicity campaign has therefore been instituted to correct this by attracting, for example, undergraduate students from the School of General Studies of the A.N.U. Next year it is anticipated that numbers will increase considerably when the Bureau of Mineral Resources with its relatively large number of geophysicists moves to Canberra from Melbourne.

This year it is proposed to hold several meetings using specially invited outside visitors as well as local speakers. The details of these meetings will be available in due course.

S.A. Branch

To date three lecture meetings have been held in 1964. On February 12, Dr. D. J. Sutton, Physics Dept., University of Adelaide, spoke on “Seismology at the University of Adelaide.” He discussed the operation of world-wide standard equipment at the Mt. Bonython Seismograph Station and participation in the W.W.S.S.P. pro-
gramme together with the use of network stations in South Australia (Mt. Bonython, Cleve, Hallet) to locate earthquakes and for other studies.

Dr. A. F. Nicholson, Philips Electrical Industries, discussed "Modes of Laser Oscillators," covering the emissive transitions of Neon-helium, Ruby rod and semiconductor lasers, the growth of oscillations, and spatial and temporal coherence in the output beam.

Forbidding meetings are as follows:
May 5. S.A. Institute of Technology.
Some Modern Developments in Meteorology, by Mr. J. Hogan (Bureau of Meteorology).

Western Australian Institute of Technology

It was recently announced that the tender for the Mathematics and Physics Departments of the new Western Australian Institute of Technology had been let for approximately £500,000.

At present Perth Technical College is located in two separate areas in the city of Perth, most of the buildings having been used since early in the century. The new Institute will be located on 270 acres of ground, some five miles south-west of the city. Work on the Chemistry, Pharmacy, Biological Sciences and Geology buildings has already been commenced, and it is hoped that the other major Departments of Engineering, Architecture, Management and Commerce will soon be under construction.

The Physics Department will be a three-storey building consisting of laboratories and staff rooms — the lecture theatres being sited in an adjacent area. Part of the lower ground floor of the Physics building will be underground. In this area will be located a neutron generator and associated radiochemical laboratories. It is planned to use activation analysis as part of a non-destructive testing programme which will also incorporate X-ray diffractometry and fluorescent spectrometry.

Other areas have been specifically planned for electron microscopy, mass spectrometry and industrial X-radiography. Strong emphasis has been placed on laboratory techniques and instrumentation, and laboratories and student workshop areas have been planned for vacuum technology, photography, electronics and glass-blowing.

At present the Physics Department offers a three-year full-time Associateship course. Entry is at matriculation level. A number of Diploma and Certificate courses are also given. It is hoped to extend the present Associateship course in the new Institute, to a fourth-year Fellowship course. This will probably be available for the first time in 1965.

Secondary School Science Grants

It will be of interest to members to note that Mr. I. J. W. Bisset, A.A.I.P., has been appointed a full-time executive member of the advisory committee, set up by the Federal Government to advise on the allocation of funds to assist secondary schools in building and equipping science laboratories. The allocation of £5m has been divided between Government and non-Government schools in the proportion of £3.75m to £1.25m.

The committee has seven members and its terms of reference will be:

To advise on the standards to be recognised by the Commonwealth in assisting in the construction and equipping of science teaching laboratories.

Upon reference from the Minister, to advise upon requests for assistance received from individual schools.

To serve as an expert body to which schools developing proposals for improving science teaching could look for advice as to the best means of meeting their particular needs.

We wish Mr. Bisset well in the new venture before him. A.I.P. will follow the committee's work with interest, and hope that Mr. Bisset will call on the Institute for any assistance or advice which it may be able to render in this important undertaking.

Siding Spring Observatory

The new Observatory has come into operation on Siding Spring Mountain, Coonabarabran, N.S.W. This Observatory functions as a field station for the Mt. Stromlo Observatory.

Two modern telescopes have been installed and are in operation; one of these is a 40" reflector by Boller and Chivens, U.S.A. The instrument is designed for work at Cassegrain and coude foci. Dr. S. C. B. Gascoigne and Mr. H. Wehner of Mt. Stromlo Observatory have been associated with the installation and early testing of the instrument, which latter is still under way. Professor B. J. Bok has secured the first observations with the instrument and reports most satisfactory photographic and photometric performances.

Tests have shown that sky conditions on Siding Spring Mountain are very much better than at Mt. Stromlo, and, accordingly, a major observational output can be expected from this new instrument. The 40" reflector is supported by a smaller instrument, viz., a 16" reflector which is already in position on Siding Spring Mountain and will be used principally for photoelectric studies on brighter stars. For this purpose the smaller and more readily handled instrument possesses advantages over the 40" reflector and, of course, frees the larger instrument for more exacting work.

Dr. H. W. Babcock

The Associate Director of Mt. Wilson and Palomar Observatories, Dr. Horace W. Babcock, paid a short visit to Australia at the end of March, 1964.

His interest lay in the programme of testing southern astronomical sites, now being carried out by his Observatory. At Mt. Stromlo he set up his equipment for instrumentally recording stellar
image motion and made measurements on a number of nights.

During his brief stay of rather less than a fortnight he also visited the recently opened Siding Spring Observatory near Coonabarabran, the Great Radio telescope at Parkes, as well as Mount Stirling in the Northern Flinders Ranges, South Australia, which latter is the scene of some of Mt. Stromlo site testing operations.

**Victorian Branch**

The following programme has been arranged for the Victorian Branch for 1964. Meetings are normally held in the Melbourne University Department of Physics, at 7:45 p.m.


August 20. *Electron and Phase objects*, by Mr. A. Moodie.

**Third Informal Meeting of Australian Crystallographers**

A meeting of crystallographers will be held in the Chemistry Department of Melbourne University on May 21-22. Included in the programme are the following papers:

*Studies of Molecular Interactions by X-ray Methods*, by Dr. B. M. Craven.

*Co-ordination Compounds of Chemical Significance*, by Professor G. Barclay.

*Metal-biodegradable systems*, by Dr. H. C. Freeman.

*Physical Chemistry and Phase Equilibria of Metal Oxides*, by Dr. R. S. Roth.

*Structure and Dielectric Properties of Long-chain Compounds*, by Mr. H. K. Welsh.

**Fourier Transforms and the study of Fibrous Proteins**, by Dr. R. B. Fraser.

**Neutron Diffraction Methods and Their Use in Studying Magnetic Structures**, by Mr. T. M. Sabine.

**Structural Studies of Hydrogen by Neutron Diffraction**, by Dr. E. N. Maslen.

**The Application of Inelastic Neutron Scattering in Studies of Lattice Dynamics and Spin-wave Interactions**, by Dr. A. W. Pryor.

**Implications of Dynamical Scattering Theory for Highly-accurate Structure Analysis by X-ray Methods**, by Mr. A. F. Moodie.

In addition, there will be discussion on problems associated with achieving high accuracy in X-ray measurements, and there will be one or two cocktail parties. Further information from the organizer—Dr. B. Dawson, CSIRO Division of Chemical Physics, Box 4331, G.P.O. Melbourne.

**Postgraduate and Honours Lecture Courses in Physics at Monash University, 1964.**

The following courses, averaging 15-20 lectures each, will be given during 1964 and enquiries on any one should be addressed to Dr. H. S. Perlman, Physics Dept., Monash University, Clayton, Vic. Dates of commencement are given.

*Many Body Theory*: Prof. H. C. Bolton, April 16.

*Methods of Applied Mathematics*: Mrs. B. L. Cummings, March 8.

*Low Temperature Physics Pt. 1*: Dr. W. Rachinger, April 7.

*Magnetism*: Prof. R. Street, April 7.

*Elementary Particles*: Dr. A. W. Coates, June 10.


*Quantum Mechanics*: Dr. H. S. Perlman, April 9.

*Lattice Dynamics*: Dr. A. W. Pryor, April 9.

*Low Temperature Physics Pt. 2*: A course of 12 lectures will be given by Dr. N. Kurti, F.R.S. of the Clarendon Laboratory, Oxford, during July, times and locations to be arranged.

**N.S.W. Colloquia on Topics in Solid State Physics and Chemistry**

There are at present several groups in Sydney working on related topics in solid state physics and chemistry and they are located in the two Universities and in various Government research laboratories. For these scientists there are no regular colloquia at which they can meet and discuss their problems since the interests of the Institutes (A.I.P., A.I.M., R.A.G.I.) are too wide for many meetings of interest to be held and since there is a considerable overlap of interest. A similar need was found in Melbourne and a highly successful series of informal colloquia was organized. A similar series is proposed for Sydney.

There will be no formal organization. The speaker will be invited and will act as chairman for the evening. A notice of the speaker and topic will be sent to those who inform the organizers of their interest. Professor R. H. Myers has offered the use of the Metallurgy Department, University of New South Wales, as a venue for the meetings which will be held at 7:30 p.m. on the first Tuesday of each month in Room G10. Dinner will be available before the meetings, at the University Staff Club. Tea will be served after each meeting.

Requests for information, and any suggestions of speakers or of topics will be welcome and should be sent to one of the following: Mr. T. M. Sabine, A.A.E.C.R.E., Private Mail Bag, Sutherland; Professor M. Hatherly, Metallurgy Department, University of N.S.W.; Dr. G. K. White, CSIRO Division of Physics.
FELLOWSHIP of the Australian Institute of Physics
Up to March 31, 1964.

ATTCHISON, Professor R. E., 75 Yarran Road, Oatley, N.S.W.

BAILEY, Professor V. A., 80 Cremorne Road, Cremorne, N.S.W.

BELL, G. A., National Standards Laboratory, University Grounds, Chippendale, N.S.W.

BINGHAM, R. T., Hillcrest Road, Warrawong, via Ringwood, Vic.

BIRKETT-CLEWS, Professor C. J., Department of Physics, University of Western Australia, Nedlands, W.A.

BOAS, Dr. W., Division of Trilophysics, University of Melbourne, Parkville, N.2, Vic.

BOK, Professor B. J., Mount Stromlo Observatory, Canberra, A.C.T.

BOWEN, Dr. E. G., Division of Radiophysics, University Grounds, Chippendale, N.S.W.

BOTLE, Professor A. J. F., Physics Department, University of W.A.

BRIGGS, Dr. B. H., 5 Easton Avenue, Highgate, S.A.

BRIGGS, Dr. G. H., National Standards Laboratory, University of Adelaide, Kadina Street, C.1, Vic.

BRUCE, Dr. C. G., National Standards Laboratory, University Grounds, Chippendale, N.S.W.

BURDON, Dr. R. S., 10 Fisher Street, Tusmore, S.A.

BUTEMENT, W. A. S., 5A Barry Street, Kew, Vic.

BUTTON, J. C. E., 19 Church Street, Woolwoah, N.S.W.

CAMPBELL, J. G., 11 Lansell Road, Toorak, S.E.2, Vic.

CASS, Dr. E. J., Physics Department, University of Melbourne, Parkville, N.2, Vic.

CHERRY, R. O., Physics School, University of Melbourne, Parkville, N.2, Vic.

CHRISTIANSEN, Professor W. N., 56 Roland Avenue, Wahroonga, N.S.W.

CLARK, K. H., C/- Cancer Institute, 278 William Street, Melbourne, C.1, Vic.

COWLEY, Professor J. M., Department of Physics, University of Melbourne, Parkville, N.2, Vic.

CARY, Dr. J. F., National Instrument Company, Acrost, Essendon, Vic.

DAVIES, Dr. R. W., 53 Tord Street, Roseville, N.S.W.

DEACON, E. L., 9 Spencer Street, Beaumaris, S.10, Vic.

DIGHTON, Dr. J. N., National Standards Laboratory, University Grounds, Chippendale, N.S.W.

DYER, Dr. A. J., 17 Small Road, Moorabbin, S.20, Vic.

ELLIOTT, Professor G. R. A., Physics Department, University of Tasmania, Hobart, Tas.

ESSERMAN, N. A., 3 Wallangra Road, Doover Heights, N.S.W.

EVANS, Dr. S. I., Director, The Institute of Technology, S.A.

FARRANDS, Dr. J. L., 38 Sunnyside Avenue, Camberwell, E.6, Vic.

FENTON, Dr. A. G., Physics Department, University of Tasmania, Hobart, Tas.

FLETCHER, Professor N. H., Department of Physics, University of New England, Armidale, N.S.W.

FRASER, Dr. R. B. B., 36 Thomson Street, Essendon, W.5, Vic.

FROST, H. J., Defence Standards Laboratories, P.O. Box 78, Ascot Vale, W.2, Vic.

GARDINER, Dr. E. L., Aeronautical Research Laboratories, P.O. Box 4331, G.P.O., Melbourne, Vic.

GATES, Dr. B. G., 53 Plumtree Road, Bentleigh, S.11, Vic.

GIOTTO, Dr. R. J., National Standards Laboratory, University Grounds, Chippendale, N.S.W.

GIOVANELLI, Dr. R. G., National Standards Laboratory, University Grounds, Chippendale, N.S.W.

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GREEN, Professor H. S., Department of Mathematical Physics, University of Adelaide, Adelaide, S.A.

GUTMANN, Associate Professor E., Physical Chemistry Department, University of New South Wales, Kensington, N.S.W.

HALL, Professor E. O., Department of Metallurgy, Newcastle University College, Tiches Hill, N.S.W.

HALL, Dr. K. D., Ferranti Limited, P.O. Box 143, Salisbury, S.A.

HARPER, A. F. A., National Standards Laboratory, University Grounds, Chippendale, N.S.W.

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HEAD, Dr. A. K., Division of Tribophysics, C.S.I.R.O., University of Melbourne, Parkville, N.2, Vic.

HIBBERD, Dr. F. H., Department of Physics, University of New England, Armidale, N.S.W.


HIGGS, A. J., 10 Dunbar Street, West Ryde, N.S.W.

HIRST, Dr. F., 11 Westminster Street, Bulwau, E.8, Vic.

HIRST, Dr. H., Box 21078, G.P.O., Melbourne, Vic.

HOGG, Dr. A. R., Mount Stromlo Observatory, Canberra, A.C.T.

HOPPER, Professor V. D., Physics Department, University of Melbourne, Parkville, N.2, Vic.

HUXLEY, Sir Leonard, Australian National University, Box 4, G.P.O., Canberra, A.C.T.

JAEGNER, Professor J. C., Australian National University, Box 4, G.P.O., Canberra, A.C.T.

JOHNSON, E. B., 26 South Terrace, Adelaide, S.A.

KERR, Dr. F. J., Division of Radiophysics, University Grounds, Chippendale, N.S.W.

KINGSTON, R. S. 1., 26 Baring Crescent, Croydon, Vic.

LANG, K. C., Defence Standards Laboratories, Box 20, P.O., Ascot Vale, W.2, Vic.

LANG, W. J., Textile College, Gordon Institute of Technology, Geelong, Vic.

LEHANY, F. J., National Standards Laboratory, University Grounds, Chippendale, N.S.W.


LUCAS, Dr. L. N. D., Physics Department, University of Western Australia, Nedlands, W.A.

LUSBY, Assoc. Professor S. G., 58 Massey Street, Ascot, Brisbane, Qld.

MCAYLAI, Professor A. L., 243 Churchill Avenue, Sandy Bay, Tas.

MCCLURE, Dr. G. C., 34 Sandleheath Road, Elizabeth Grove, S.A.

MCDONELL, Dr. J. A., Alfred Deakin Hall, Monash University, Clayton, Vic.

MACKENZIE, Dr. A. B., Division of Tribophysics, G.S.I.R.O., University of Melbourne, Parkville, N.2, Vic.

MACDONELL, Sir John P. V., 1 Wandella Avenue, Roseville, N.S.W.

MACKINNON, Mrs. K. R., 19 Fern Street, Pymble, N.S.W.

MACKINNON, Dr. R. E. S., Department of Physics, University of Sydney, Sydney, N.S.W.

MARTIN, S. L., 35 Flinders Street, Burwood, E.3, Vic.

MARTYN, Dr. D. F., Upper Atmospheric Section (UAPS), Woombye Road, Camden, N.S.W.

MELVILLE, Professor H., School of Physics, University of Sydney, Sydney, N.S.W.

MILLER, Dr. A. R., 29 Rochester Road, Canterbury, E.7, Vic.

MILNER, Professor C. J., School of Physics, University of New South Wales, Kensington, N.S.W.

MOFFET, Assoc. Professor C. B. O., Department of Physics, University of Melbourne, Parkville, N.2, Vic.

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PRIESTLEY, Dr. C. H. B., C.S.I.R.O., Station Street, Aspendale, S.13, Vic.
PYBUS, A. W., 9 Harris Street, Glenelg, S.A.
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RAYNER, J. M., 5 Tennyson Crescent, Forrest, A.C.T.
REIMANN, Professor A. L., Department of Physics, University of Queensland, St. Lucia, Q'ld.
RICHARDSON, J. F., Commonwealth X-Ray and Radium Laboratory, 30 Lonsdale Street, Melbourne, Vic.
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SPICER, Dr. B. M., Physics Department, University of Melbourne, Parkville, N.2, Vic.
STANFORD, H. W., Department of Medical Physics, Royal Perth Hospital, Perth, W.A.
STREET, Professor B., Department of Physics, Monash University, Clayton, Vic.
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WEBSTER, Professor H. C., Department of Physics, University of Queensland, St. Lucia, Q'ld.
WHITE, Sir Frederick, C.S.I.R.O., P.O. Box 109, Canberra City, A.C.T.
WHITE, Dr. G. K., National Standards Laboratory, University Grounds, Chippendale, N.S.W.
WILD, Dr. J. P., 3 Strathfield Avenue, Strathfield, N.S.W.
WILLIAMS, Dr. S. E., Physics Department, University of Western Australia, Nedlands, W.A.
WOOD, Dr. F. W., 6 Penfield Avenue, Salisbury, S.A.
The Australian Institute of Physics was formed as an incorporated body in February, 1963. Prior to the formation of the A.I.P., the physicists of Australia were represented by the Australian Branch of the British Institute of Physics and The Physical Society. In matters relating to physics and its applications and the profession of the physicist, the A.I.P. is the body within Australia which represents the profession and to which the majority of physicists belong. Membership is divided into three professional grades — Fellow, Associate and Graduate. In addition, there are Students and Subscribers.

The affairs of the A.I.P. are managed by an elected Council consisting of an Executive and the Chairmen of A.I.P. Branches. The Branches are formed to further the objects of the A.I.P. on a geographical basis and at present there are six — A.C.T., N.S.W., Queensland, S.A., Victoria, and W.A. Members are in general attached to the Branch of the area in which they reside. There is also provision for members to belong to subject Groups formed within the Institute. There are two such groups — Biophysics Group and Geophysics Group.

The A.I.P. provides a means whereby the promotion and furtherance of the development and application of physics, and the encouragement of education and training in physics may proceed. For the purpose, the A.I.P. holds meetings and exhibitions, and distributes information relating to physics. Information on the activities and membership of the A.I.P. may be obtained from the Honorary Secretary or any of the Branch Secretaries.

THE AUSTRALIAN PHYSICIST

At the January, 1964, meeting of the Council of the Australian Institute of Physics, it was considered that urgent attention should be given to the publication of an Institute bulletin which contained matters of interest and importance to physicists in Australia. The Australian Physicist is the result of the decision.

Apart from covering Institute affairs, announcements, news of members and notes on Council, Branch and Group activities, it will contain articles on matters affecting physicists, letters to the editor, comments and announcements by overseas and local scientific bodies, advertisements of positions, Fellowships and so on, book reviews and advertisements from instrument firms, publishers, etc.

Distribution is on a national basis and, as the official monthly bulletin of the Institute, it will be published monthly. Publication date will be approximately the 21st of the month of issue. Editorial copy deadline will be 21st of the month prior to the month of issue. Advertising copy deadline will be the 1st of the month of issue. Information on advertising rates and data are available from the Advertising Manager.
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