Employment of 1972 Graduates . . . . 105
CAP—A Comparison—AIP—J. R. Prescott . 106
Notes and News . . . . 110
11th Annual General Meeting . . . . 111
24th Council Meeting . . . . 112
List of Members . . . . 113
Amendments to By-Laws . . . . 138
Election of Executive . . . . 139
Company Subscribers . . . . 140
Should Physics Courses be Radically Changed 141
Book Reviews . . . . 143
The Calendar . . . . 144
The Australian Physicist

EDITORIAL ADDRESS
The Editor, Australian Physicist
c/- AAECRE, Sutherland, NSW 2232
Telephone: (02) 353-0111

EDITORIAL COMMITTEE

Associate Editors
ACT Mr F. W. Brown, Box 378, Canberra, ACT 2601
NSW Dr J. C. Macfarlane, NSL, Sydney Uni., NSW 2006
QLD Prof. H. C. Webster, 12 Tarcoola St, St. Lucia, QLD
SA Dr P. W. Seymour, Maslon Inst., Adel. Uni., SA 5000
TAS Dr P. M. Mc Culloch, Tas. Uni., Hobart, TAS 7000
VIC Dr J. D. Cashion, Monash Uni., Clayton, VIC 3168
WA Dr J. R. de Laeter, WALT, South Bentley, WA 6102

SUBSCRIPTIONS
Non-members: $8.00 per annum (Australia), $8.50 per annum (Overseas).
Single issues: $0.80 (Australia), $0.85 (Overseas).

All enquiries and correspondence concerning subscriptions to: Australian Institute of Physics, PO Box 52, Parkville, VIC. 3052.

ADVERTISING
All enquiries concerning advertisements to the Advertising Manager: J. T. O'Mara, PO Box 59, Bondi Junction, NSW 2022; Telephone: (02) 389-9698.


Advertising Deadline—6th of month of issue.

COPY
Manuscripts (original plus one copy) should deal with topics of interest to physicists in Australia, such as developments in the teaching or practice of physics and reports on lectures, conferences, Australian facilities, Institute Affairs, etc. They should be double-space typed on one side of the paper only, with margins 40 mm wide, and should follow the style used in this journal. The recommended length is up to 4 pages for articles (as printed with figures), up to 500 words for letters, and up to 250 words for Notes and News.

Deadline—15th of month prior to month of issue.

Figures—High contrast originals, 80 mm wide (or if essential, 168 mm wide) and minimum necessary height are required for printing. Larger originals can be used but authors are asked to pay for preparation costs with the purchase of reprints.

References—are to be cited in the text thus:
[Brossel, 1947] or Brown [1971].

They should be arranged alphabetically at the end of the article and be presented thus:

Standards—Concise Oxford Dictionary; Metric Units (SI); Symbols, Units and Nomenclature in Physics, IUPAP Document UIP II (SUN 65-3) 1965; World List of Scientific Periodicals.

Copies—Two kinds of copies of items published are available to authors:
Extracts—the relevant pages as they are printed in the journal;
Reprints—printed separately, with any extra requirements by authors such as covers, special headings, etc.

AUSTRALIAN
INSTITUTE OF PHYSICS
Tasmanian Branch
SUMMER SCHOOL
28-31 JANUARY, 1975

The Summer School will be held at the University of Tasmania and will consist of a series of approximately 18 lectures, with no parallel sessions, on two topics in astrophysics:

INFORMATION PROCESSING IN ASTRONOMY
HIGH ENERGY ASTROPHYSICS

Accommodation will be available on campus at Christ College—bed and meals, $7.50.

Fees:
AIP Student Members $20
AIP Members $30
Non Members $35

Anybody interested should contact:
AIP Summer School Convener,
c/- Department of Physics,
University of Tasmania,
G.P.O. Box 252 C, Hobart, Tas. 7001
EMPLOYMENT OF 1972 UNIVERSITY GRADUATES

A report on the destinations of 1972 Australian university graduates has recently been published by the Graduate Careers Council of Australia (GCCA) [Gravell and Rawling, 1974]. It contains the results of surveys carried out during 1973 of all University graduates (but not of Colleges of Advanced Education or Institutes of Technology). The response rate to the survey varied from 76 per cent. for science departments to 89 per cent. for engineering and applied science. Some of the data are of interest to physicists and a selection of the figures are published in this article, together with comparable data from two earlier surveys [Australian Institute of Physics, 1972; Middleton, 1971].

Table 1 summarises the destinations of all 1972 graduates in the physical sciences, mathematics, earth sciences and engineering/applied science. The 'physical sciences' category includes physics, chemistry, astronomy and meteorology. The numbers in the 'First Degree' columns refer to all students who qualified for the award of such a degree in 1972, and so include students who later progressed to an Honours or MSc course. It may be noted that the proportion of first degree graduates who went on to further full-time studies varied from 13 per cent. for engineering/applied science to 68 per cent. for the physical sciences. Engineers and applied scientists tended to go into professional, industrial and commercial jobs, while those with degrees in the physical sciences were more likely to enter government or academic posts.

First degree graduates who left university and were still seeking full-time employment at the date of the survey (30 April 1973) were proportionately more numerous in the physical sciences (7 per cent.) than in engineering/applied science (4.4 per cent.). Higher degree graduates by comparison included 2.5 per cent. unemployed in the physical sciences and none unemployed in engineering/applied science.

As a measure of dissatisfaction with their jobs, some 10 per cent. of higher degree physical scientists in full time employment considered the work not appropriate to their qualifications, while only 4 per cent. of comparable engineering/applied science graduates were of this opinion.

We now attempt a comparison between the results of the GCCA survey, and the projections made by two

### TABLE 1

<table>
<thead>
<tr>
<th>How Employed</th>
<th>Physical Sciences</th>
<th>Mathematics</th>
<th>Earth and Environmental Sciences</th>
<th>Engineering and Applied Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Degree</td>
<td>Higher Degree</td>
<td>First Degree</td>
<td>Higher Degree</td>
</tr>
<tr>
<td>Undertaking further full-time study</td>
<td>536</td>
<td>29</td>
<td>540</td>
<td>4</td>
</tr>
<tr>
<td>Government service (including</td>
<td>35</td>
<td>30</td>
<td>81</td>
<td>7</td>
</tr>
<tr>
<td>semi-govt. and statutory authorities)</td>
<td>33</td>
<td>9</td>
<td>56</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Professional, private practice, industry, commerce</td>
<td>74</td>
<td>21</td>
<td>111</td>
<td>4</td>
</tr>
<tr>
<td>Non-profit institutions (not educational or hospital)</td>
<td>2</td>
<td>–</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Schools</td>
<td>48</td>
<td>14</td>
<td>129</td>
<td>2</td>
</tr>
<tr>
<td>Tertiary Education</td>
<td>21</td>
<td>54</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>Unemployed and seeking full-time employment</td>
<td>18</td>
<td>4</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>Unavailable for full-time employment</td>
<td>10</td>
<td>4</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Overseas</td>
<td>13</td>
<td>31</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Totals of graduates</td>
<td>790</td>
<td>196</td>
<td>973</td>
<td>57</td>
</tr>
<tr>
<td>Work &quot;not appropriate to qualifications&quot;</td>
<td>35</td>
<td>14</td>
<td>39</td>
<td>5</td>
</tr>
</tbody>
</table>
earlier independent surveys of physics and chemistry graduates. The Royal Australian Chemical Institute published a detailed survey of the employment of PhD chemists [Middleton, 1971], and the Australian Institute of Physics [1972] carried out a survey of physics graduates in general. The 1969-74 data (or forward estimates) from these two surveys for the case of higher degree graduates in physics and chemistry have been combined and are graphed in figure 1, along with the estimated employment demand curve from the same sources. (Note: the RACI results do not include MSc chemists.) The 1972 results of the GCCA survey are drawn in for comparison. The actual excess of supply over demand found in the latest survey is much less than the earlier results had predicted, and it appears that the convergence of the curves may have taken place more rapidly than expected. This impression must be treated with caution, since a pessimist might well argue that the 24 per cent. who did not reply to the GCCA survey were all unemployed. Similar sampling errors were of course likely to exist in the earlier surveys as well.

There are however other indications that the supply-demand situation is by no means static, and hopefully this will become clearer as successive surveys by Appointment Boards and other bodies come to fruition. The reader is left to consider what further role the Australian Institute of Physics can or should play in the matter of the employment of physicists. It has been suggested [West, 1972] that the announcement of an imbalance in the supply and demand of any product, be it PhD or an agricultural product such as pork, will influence members of the community to reverse the imbalance. This effect if it exists may in itself justify the effort entailed in conducting employment surveys.

– J.C. Macfarlane

References

West, C.E. Search, 3: 321. (1972)

CAP – A COMPARISON – AIP

J.R. Prescott

Professor Prescott joined the Institute of Physics in his student days and, while in Canada from 1956–1971, was a member of the Canadian Association of Physics. At the request of the President, Dr. F. Jacka, he sets down a personal comparison of the two organisations as he sees them.

Introduction

The activities of both the Australian Institute of Physics and the Canadian Association of Physicists share a strong common determining factor: the size of the country in relation to the population in general and the density of physicists in particular.

The lines of communication between Victoria on Vancouver Island at one end and St. John's, Newfoundland at the other stretch much the same distance as those from Perth, Western Australia to Townsville in Queensland. If you stationed the members of either society at equal distances along these lines, communication might just about be possible by semaphore but certainly not by shouting. It may be remarked that the author's view of the topic is largely that of someone living towards the westerly end of the line, in both countries. Furthermore, it is a personal view and I am not about to complain if someone chooses to take issue with my interpretation of the scene.

It is interesting that the response to this degree of isolation has been handled in different style in the two countries. Generally speaking, the Canadian philosophy has been to organise its activities on a national basis, with the aim of achieving a degree of unity between physicists across the country, whereas the Australian
pattern has been to retain a strong local organisation in each state and to view the national organisation more as a co-ordinator. These tendencies are illustrated by the fact that the CAP has been holding an annual Congress ever since the Association was founded in 1945, whereas the AIP will hold its first national Congress this year, 1974. Perhaps this is the place to remark that I hope the latter venture develops to be as successful as its Canadian counterpart. By contrast, although the CAP constitution allows for the formation of local Sections, the only active local section is in the Ottawa area. In Australia, there are Branches in each state and the ACT and some 25 per cent of the funds administered by the Institute are devoted to the activities of these Branches.

The two countries share a Federal-State system (Federal-Provincial in Canada) and, at a political level, the tensions between the two seem to be about the same in the two countries. It is therefore interesting that the two professional organisations should have developed according to different philosophies. While it would not be true to say that physicists in Western Canada are thoroughly au fait with what goes on 'down east' (and vice versa), it does seem to me that there is a much greater degree of feeling of identity with their colleagues elsewhere in Canada than I find in Australia.

It may well be that one sees in the two attitudes evidences of quasi-political influences of a different kind. The AIP was created relatively recently out of a set of branches which originally owed their foundation and professional allegiance to a parent organisation in the distant United Kingdom. Canada shares a frontier with the USA and thereby has a more obvious reason for cultivating a national consciousness and identity. Although relations between the American Institute of Physics/American Physical Society and the CAP are most amicable, it seems clear that many Canadian physicists prefer to belong to the former, larger organisation rather than the CAP because of the greater range of activities and services that it offers. Many, of course, belong to both but the membership of the CAP suffers to some extent.

Membership

In 1971 the estimated number of physicists employed in Canada in all spheres of activity was about 3,500 of which all but 500 were in educational institutions of various kinds. In the same year the membership of the CAP was 1,735 full and affiliate members, including 62 undergraduate student members. The population of Canada is about 22 million. From a population of 13 million, the Australian Institute of Physics had, in 1971, a membership of 1,616 including 172 student members. The number of physicists in Australia in 1971 is estimated to have been about 4,200.

It is interesting to speculate on the reason why the number of professional physicists should be about the same in two countries of substantially different population. During most of my time in Canada there was a rapid diffusion of physics graduates southwards across the 49th parallel to industrial positions in the US, although this drift has slowed down in recent years.

An examination of the breakdown by categories of employment suggests that the difference is almost entirely accounted for by the employment of Australian physicists in Commonwealth and State Government organisations including the CSIRO. In both countries the employment of physicists in industry is very low and in both the CAP and the AIP the number of secondary school teachers is almost negligible. At the time I left Canada concern was being expressed at the falling student membership of the CAP and, although there is some sign that this trend may have been reversed, the AIP has been consistently more successful in attracting student members. Some recent trends are shown in the following table which compares the memberships of the two organisations over the five-year period 1968–72.

<table>
<thead>
<tr>
<th></th>
<th>CAP</th>
<th></th>
<th>AIP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Members</td>
<td>Students</td>
<td>Members</td>
</tr>
<tr>
<td>1968</td>
<td>1407</td>
<td>105</td>
<td>1408</td>
</tr>
<tr>
<td>1969</td>
<td>1434</td>
<td>123</td>
<td>1503</td>
</tr>
<tr>
<td>1970</td>
<td>1655</td>
<td>91</td>
<td>1560</td>
</tr>
<tr>
<td>1971</td>
<td>1735</td>
<td>62</td>
<td>1616</td>
</tr>
<tr>
<td>1972</td>
<td>1772</td>
<td>43</td>
<td>1692</td>
</tr>
</tbody>
</table>

Although the details of the membership structure differ somewhat between the two organisations, the Corporate grades of the AIP correspond to full members of the CAP and the AIP Non-Corporate grades to the Affiliate Membership of the CAP. The figures seem to support the contention that both organisations are approaching equilibrium. The most notable difference in the membership structure is that the AIP retains a strong flavour of a professional society, with a hierarchy of three grades within the Corporate Membership, each requiring specified qualifications. This is undoubtedly a legacy of the influence of the parent organisation in Britain. It is difficult for me to judge how significant these grades of membership are in determining professional status in the Australian context but I get the impression that it is rather the latter that determines the former. By contrast, while CAP full-membership does require professional qualifications, they correspond to the minimum requirement of the AIP and the society seems to have the spirit more of a “Learned Society”.

Those of us who have been members of both the British Institute of Physics and the former Physical Society will perhaps best appreciate this distinction.

In addition, both organisations have a further grade, called “Company Subscriber” by the AIP and “Corporate Member” by the CAP. These members are institutions or companies who subscribe a minimum sum to the organisation because they have a direct or an indirect interest in promoting the support of Physics. In 1971, the number of such memberships in the AIP was 25 and in the CAP it was 35. The latter membership included eight universities, the remainder being industrial and commercial firms covering a wide spectrum of activities. In Canada, the subscriptions of this class of
subscriber are paid into an ‘Educational Trust Fund’ and, as such, are tax deductible. The functions of the Educational Trust Fund are described in more detail below.

**General Activities**

The CAP has a much larger number of specialist subject divisions than does the AIP (twelve to four). I had personal involvement in Canada with the theoretical physics, nuclear physics and education divisions, and a peripheral contact with earth physics. I found the various conferences, symposia and summer schools, particularly those organised by the first two, to be uniformly excellent in quality and to provide many very stimulating personal contacts with colleagues from other parts of the country. Such contacts were particularly appreciated by students. It is regrettable to note the disbanding of several subject groups in Australia in recent years. In Australia, summer and vacation schools organised by the Branches do seem to have been quite successful in attracting attendance from other States.

My own experience of the branches in Australia is confined to those in Melbourne (some 20 years ago) and in Adelaide. Branch activities have, of course, changed with the times and it does seem to me that they serve a very useful purpose in bringing together groups of physicists when there are enough of these in a given geographical area. In the Australian context this means bringing together physicists from educational institutions and government laboratories. In Canada, with its much larger proportion of ‘academic’ physicists, the value of local branch meetings seems less obvious since academics generally have a variety of other reasons for getting together.

On the whole, considering the activities of Subject groups and Branches together, the two organisations operate similar programmes, although the scale of operations in Canada is significantly larger. I am inclined to attribute this to a greater consciousness of activities in other parts of the country and to a more ready availability of funds to allow interstate travel.

Both groups publish a journal, *Physics in Canada* and *The Australian Physicist* are similar in scope, cover much the same sort of material and quote each other from time to time. Both have been well served by devoted editors and are worth reading. If anything, I find the Canadian Physicist rather more chatty and informal and it carries considerably more news about people. For some years, *Physics in Canada* has been published by a direct photo-offset method which is considerably cheaper than typesetting. In most of the last few years, *Physics in Canada* has covered its production expenses through advertising; the introduction of cheaper methods of reproduction enabled that condition to be maintained in spite of falling advertising revenue. *The Australian Physicist* is now also using cheaper methods of reproduction. Both publications are “current awareness” journals rather than “archival” and it seems sensible to use a relatively cheap though possibly less durable format.

One feature of *Physics in Canada* that seems unlikely to find an Australian counterpart is that a proportion of the contents is in French. The cover and title page are fully bilingual, as are all official documents of the CAP/ACP. Nevertheless in proportion to the population of French-speaking Canadians, French-Canadian physicists are relatively few. Why this should be so is an interesting question but one which does not call for discussion at this time.

**Educational Activities**

The sphere of activity in which the operations of the CAP differ most markedly in scale from the AIP is on the educational and community side. These are defined by the CAP to be “those activities which contribute to the education in Physics of the general public and of students up to graduation at the BSc level”. Those activities which are of direct benefit to full members, including graduate students, are by contrast called “professional activities”. Educational activities include the CAP high-school examinations, the CAP University prize examinations, CAP lecture tours, the annual undergraduate physics conference and publications on educational subjects. These activities are financed from the Educational Trust Fund into which contributions from institutional subscribers are paid; some contributions are made by individual members and from time to time special purpose grants are paid into the fund. In the last two years the total expenditures ran at about CAN$9000.

Each year a CAP series of lecture tours is arranged in which lecturers from one part of Canada visit a group of universities in another. The CAP pays the travel costs while the host university looks after the local expenses of the speaker. In all, some forty-five institutions in eleven regions are visited by a dozen or so speakers. The tours are particularly appreciated by the smaller universities but it is significant that last year, when the larger universities were given the opportunity to opt out, only one did so.

Each year the CAP conducts a nation-wide competition among senior undergraduates studying physics and awards a prize to the top candidate. The purposes of the competition are to stimulate individual scholarship and to foster a spirit of friendly rivalry among universities. It is hoped that the quality of teaching in Canadian universities will thereby be improved. There are usually about 120 candidates and the winner gets a $300 prize and an expenses-paid trip to the Annual Congress to receive his prize at the banquet.

For the last ten years or so, a nation-wide Undergraduate Physics Conference has been held, with the venue changing from year to year. Attendances as large as 200 have been recorded. These conferences take place at a weekend and include guest-speakers, student papers, a tour of a research laboratory and various social activities. I have had no personal experience with these conferences but students and university staff members who have attended them consider them to
be well worthwhile. The organization of the conference is largely in the hands of undergraduate students themselves.

Each year, in each province, CAP high-school prize examinations are conducted. Since there is a surprising diversity of standards and syllabuses in the final year of secondary education in Canada, each province conducts its own examination. In 1972, 6284 students from 884 schools wrote the examination. The CAP provides the sum of $400 per province for prizes and it is common for local groups to supplement this in various ways.

An interesting feature of the cultural scene in Canada are the “Youth Science Fairs” which are held across the country in some 40 regions. In these, students submit an exhibit about a research-type project of a standard appropriate to their level of education, in competition with others. The CAP is not directly concerned with the organisation of these science fairs but does support the National Youth Science Foundation under whose sponsorship the fairs are held.

In Australia, educational activities of the foregoing kinds seem to be exclusively the province of the state branches and little publicity appears to be given to them; it is therefore difficult to judge how much actually goes on. While one should be cautious in attempting to translate experience in one country into a differing educational environment, it is my view that the Australian Institute of Physics could profitably undertake some Australia-wide activities at the undergraduate and possibly secondary educational level.

The CAP awards annually the CAP Medal for distinguished achievement in physics and the Herzberg Medal for outstanding achievement by physicists not more than 38 years of age. Many Australian societies similar to the AIP already award similar medals and the Australian Institute of Physics might well consider doing so also.

Science Policy and Community Affairs

Members of both Societies serve on national representative committees of various sorts. This is an area with which I am relatively unfamiliar but it is perhaps worth mentioning that the CAP has been actively involved in SCITEC, The Association of Scientific Engineering and Technological Community of Canada, set up in 1969 to provide a means by which the scientific community in Canada could speak with one voice on Science Policy. After five years in which SCITEC seemed to be wondering what it was really set up for, what its voice was and what it should be saying, it seems at last to have found a useful role in providing a forum as well as a voice in Science Policy on a national scale. While it would not be true to say that this constitutes a major CAP activity it does serve to illustrate the long-established awareness of that organisation for Science Policy matters in general. The nearest Australian equivalent seems to be the Conference of Allied Societies which includes the AIP, RACI, AIMM and Institution of Engineers (Australia): it seems to have the same problems as SCITEC.

In recent years the CAP has prepared a number of special reports and contributed to others; among these are:

Physics in Canada:— Survey and Outlook (1967) (The Rose Report). This 385 page report was commissioned by the Science Secretariat (an entity set up to advise the Government of Canada on Science Policy) which provided $32,000 towards the cost.


Purpose and Choice in the Support of University Research in Physics (1971) (The Laurence Study). Supported by the National Research Council of Canada by a grant of $48,000, this 38 page report was published as a special issue of Physics in Canada Vol. 27, No. 5.

Study on Student Attitudes towards Science and Technology (1971) Physics in Canada Vol. 27, No. 6, 73-77. The latter study was only partially finished because of funding difficulties.

It is my impression that such surveys have had somewhat limited impact and it seems to me arguable whether the effort was worth it. Even though substantial external financial support was forthcoming for these reports, they cost the Association considerable amounts of its own money. Perhaps, however, the discussion and thinking that goes with the preparation and discussion of the reports is sufficient justification.

Finances

Comparisons of financial affairs are often illuminating but in the present case they turn out to be difficult because of the different methods of accounting. I have therefore extracted some approximate numbers from the published financial statements for 1972.

The CAP collected about $30,000 in regular membership fees in 1972 from a membership of 1770. In addition “Company Subscribers” and others paid $7 150 to the Educational Trust Fund. The AIP from a regular membership of 1692 collected $16 000 (in 1973 increased fees will have brought in substantially more to the AIP). The membership fee structures of the two organisations differ markedly and both seem appropriate to the membership structure itself. The CAP has lower fees for its members under 30 years of age. As mentioned earlier, advertising revenue is substantial ($9 000) for Physics in Canada and it covered the cost of the journal; $2 000 in subscription went into general revenue. The AIP has a separate account for the Australian Physicist. It draws the same amount of subscription income as Physics in Canada but advertising revenue was only $1 750 in 1972 and the AIP itself put in $7 200 (34 per cent of its total budget).

A significant additional source of net income for the CAP comes from the Annual Congress. In 1972 it was $9 000. Only the net income from the Congress is shown in the annual financial statements. The surplus comes partly from a charge to commercial firms for the right to exhibit their wares — instruments and books.
mostly—and partly from ensuring that the registration fee is generously large enough to cover all the organisational expenses of the Congress. There were 645 registrants at the 1972 Congress in Edmonton. The registration fee was $25.00 for members and $30.00 for non-members.

In summary, the CAP had about CAN$62 000 to pay for its activities compared with about AU$21 000 for the AIP. Making due allowance for exchange rates, salary and wage levels and cost of living, a Canadian dollar in Canada is worth about the same as an Australian dollar in Australia for the purposes of our present comparison. The message seems to be that the reason for the greater scale of CAP operations is that they have more money to spend. In turn the latter seems to be because they have successfully tapped sources of funds not yet touched in Australia.

NOTES AND NEWS

People and Institutions

Visit of Professor Pippard

Professor A.B. Pippard, FRS, Cavendish Professor of Physics, Cambridge, will be touring Australia in August. He will speak on his educational interests (especially the education of physicists), or in some cases possibly on his research into the properties of metals. The itinerary which follows is not fully confirmed, and members should check their own branch notices. NSW (13/8), Queensland (15/8), ACT (16/8), Victoria (18/8), Tasmania (20/8), SA (22/8), WA (23/8).

Visit of Professor Lipson

Professor H.C. Lipson (University of Manchester Institute of Science and Technology), will be attending the Crystallography Conference in Melbourne in August. He will be in Sydney from 30 July to 11 August, and the Education Group hopes to arrange a meeting on 6 August. The Victorian section of the Education Group has invited Professor Lipson to speak on Wednesday 14 August, and the Victorian Branch has arranged a joint meeting with Professors Maréchal and Françon on Thursday 15 August.

Professor R. Street

The new director of the ANU Research School of Physical Sciences will be Professor R. Street, of Monash University. Professor Street will take up his new post (which was vacated last September by Professor Titterton), later in the year.

Anglo-Australian Telescope

The Australian Minister for Science announced in May that the allocation of observing time on the AAT will be in the hands of a committee comprising:

Dr A.W. Rodgers, Dr D.S. Mathewson and Dr K.C. Freeman (all of ANU); Dr R.R. Shobbrook (University of Sydney); Dr M.D. Waterworth (University of Tasmania); Mr B.J. Harris (Government Astronomer, WA); and Mr J.G. Bolton (Division of Radiophysics, CSIRO).

The observing time will be shared equally by Australian and UK astronomers. The telescope will be officially opened by H.R.H. The Prince Charles in September or October, and will come into regularly scheduled service early next year.

Balloon Launching to Continue

The agreement between the Australian Government and the U.S. Atomic Energy Commission, under which studies of the upper atmosphere are made from balloons launched at Mildura, Victoria, has been renewed. The facilities are not fully utilized, but there has been sufficient interest shown in Australia to persuade the Department of Supply to continue its operation.

Dr M. Duggin

Mike Duggin of the CSIRO Minerals Research Laboratories is spending five months overseas, investigating progress in remote sensing.

Dr P.J. Mulhearn

Dr. Mulhearn has joined the CSIRO Division of Environmental Mechanics, to coordinate projects which use the wind tunnel, and to conduct research in fluid mechanics. His previous appointments were at the University of Cambridge and the RAN Research Laboratory.

Academics Visit China

The visit of Dr J.P. Wild (AP June) was made as part of a group of nine members of the Australian Academy of Science. The other members of the party were Professor Sir Rutherford Robertson (AAS). Professors G.L. Ada, J.D. Ovington, H.A. Buchdahl and Liu Ts'un-yen (ANU); Dr R.M. Williams (ANU); Professor R.D. Brown (Monash); and Dr J.M. Rendel (CSIRO Animal Genetics).

AIP Visiting Lecturers

Council is supporting a visit by Professor A. Maréchal and Professor M. Françon of the University of Paris who will address Branches on their way to a meeting in Sydney. Professor Maréchal will speak on Research at l'Institut d'Optique, of which he is Director, or on the Organization of Science in France. Professor Françon will give a lecture-demonstration on Wave Aspects of Light and the Fourier Transform. The talks will be in Perth on 12 August, Adelaide on the 13th or 14th, and Melbourne on 15th.
MINUTES of the 11th Annual General Meeting of the Australian Institute of Physics, held in South Theatre 1, The Flinders University of South Australia, Bedford Park, SA, at 4.15 pm on Tuesday, 21 May 1974.

1 ATTENDANCE
1.1 Present


1.2 Apologies and Proxies

An apology was received from Dr I. A. Newman. No proxy was appointed.

2 10TH ANNUAL GENERAL MEETING
2.1 Minutes

RESOLVED that the Minutes of the 10th Annual General Meeting, held in Physiology Lecture Theatre No. 1, University of Queensland, St Lucia, Qld, on Thursday 8 February 1973, as published in the April 1973 issue of "The Australian Physicist", be taken as read and confirmed.

3 11TH ANNUAL REPORT AND FINANCIAL STATEMENTS

The President introduced the 11th Annual Report and Financial Statements, which had previously been published as an insert in the March 1974 issue of "The Australian Physicist", and drew attention to the second paragraph of the Annual Report which contained a resolution passed at the 23rd Council Meeting regarding subscription increases. He suggested that should there be any questions regarding the Financial Statements, these questions should be addressed to the Hon. Treasurer Dr J. K. Mackenzie.

Professor J. R. Prescott (SA) queried the wisdom of maintaining investments. Would not the interests of the Institute be better served if this money were to be spent now whilst it was worth something, and the budget be constructed on the basis of current revenue.

Mr G. C. Fletcher (NSW) queried the magnitude of the reserves (now termed Funds Held on Behalf of Branches and Groups).

The Hon. Treasurer replied that these were arguable points which had been discussed in Council.

He pointed out that the majority of the money invested was held by Council on behalf of the Branches. It was Branch funds at call. If the members wished to see this money expended they should advise this to their Branches. The remainder of the investments, about $7,500, represented a very small buffer on which to run an Institute with a $30,000 turnover.

RESOLVED that the 11th Annual Report and Financial Statements be adopted.

4 APPOINTMENT OF AUDITOR

RESOLVED that Maxwell Witherow and Company of 131 Queen Street, Melbourne, be appointed Auditors for 1974.

5 SPECIAL RESOLUTIONS TO AMEND CLAUSES 2, 5, 6, 7, 8, 9, 10, 18, 19, 21, 65 and 70 of the Articles of Association be amended as set out in the April issue of "THE AUSTRALIAN PHYSICIST"

The Hon. Secretary reported that the changes to Articles as published in the April issue of "The Australian Physicist" had been approved by the Law Department following negotiations extending over 12 months.

MOVED that Clauses 2, 5, 6, 7, 8, 9, 10, 21, 65 and 70 of the Articles of Association be amended as detailed in the April issue of "The Australian Physicist" in order that the present corporate grade of Associate can be re-named Member, and the title Associate can be used for a non-corporate grade to include newly-qualified physics graduates gaining the experience necessary to qualify for Grad. A.I.P., and also professional persons qualified and engaged in disciplines other than physics and that the present abbreviated titles of Hon. F.A.I.P., F.A.I.P., A.A.I.P. and Grad. A.I.P. can become Hon. F.A.I.P., F.A.I.P., MAIP and MAIP respectively.

In reply to a question concerning the new grades of membership, the Hon. Secretary was asked to set out the new grades on the blackboard in order that all members present could see the grades of corporate and non-corporate membership.

The opinion was expressed that a simpler structure of membership should be investigated.

The Hon. Secretary replied that Council had considered other alternatives, but had decided that the changes as set out in the amendment to Articles were appropriate.

Dr T. M. Sabine (NSW) stated that there was every possibility that grades of membership could eventually be written into industrial awards. He quoted the hospital physicists as an example, and was of the opinion this could very well follow throughout other professions in which physicists were employed.

It was pointed out that information regarding the proposed amendments had been relayed to members through the Branch Chairmen and no adverse comments had been raised until this meeting.

CARRIED with 1 dissenter.
MOVED that Clause 18 be amended as detailed in the April issue of "The Australian Physicist". This clause defines the grades of non-corporate membership and Council believes that it should be changed to enable members of cognate societies to become members of AIP and to participate fully in the activities of the Groups on payment of a Group subscription. It is believed that Group activities could be broadened by including as Group members those people who are interested but who are prevented from present membership either because of a qualification barrier, or because they already pay a high subscription to a cognate society.

The Hon. Secretary stated that Council believed members of cognate societies should be able to become members of the Groups and participate fully by payment of a Group subscription without having to pay a large fee to another professional society. He pointed out that these members would be able to participate in Group activities only, and not other Institute activities.

Concern was expressed that a society with a larger membership could eventually take over control of a Group.

The President replied that this had been considered and Council had decided not to attempt a general definition of a cognate society - each application would be treated on its merits. Should there be any chance of a particular society trying to take over control of a Group, that particular society could be declared to be no longer a cognate society.

Dr W. G. Elford (SA) asked what would be the voting rights of a Group Affiliate.

The Hon. Secretary replied that only corporate members could vote on Institute matters. Group Affiliates and other non-corporate members of the Groups had full voting rights within the Groups and could stand for office within the Groups.

The possibility of a Group being able to expend AIP funds on behalf of people not fully AIP members was raised, and the question asked if Council had considered this matter.

The President replied that the normal practice is that Group funds come solely from Group subscriptions, and not from subscriptions paid by other members of the Institute. As a whole, the Groups were not a financial burden on the Institute.

The motion on being put to the meeting was declared CARRIED.

OTHER BUSINESS

Two matters were raised by Dr F. H. Hibbard (NSW) and discussed, resulting in the following resolutions -

RESOLVED that Council investigate the desirability of having alterations to Articles of Association, Subscriptions, and similar issues, dealt with by a postal ballot of all corporate members of the Institute, and report their findings to the next Annual General Meeting.

RESOLVED that Council investigate the desirability of the Institute moving towards a national, rather than the present federal, structure, along the lines of the structure of the Canadian Association of Physicists, and report the result of their investigations to the next Annual General Meeting.

The meeting closed at 5.05 pm.

24TH COUNCIL MEETING

The 24th Meeting of the AIP Council was held at the South Australian Institute of Technology, Adelaide, SA, on 19-20 May 1974. The President, Dr F. J. Jacka, was in the Chair, and all Branch Chairmen were present or represented.

GENERAL POLICY

Council resolved that consequent upon the approval at the 11th Annual General Meeting of the amendments to Articles as published in the April issue of "The Australian Physicist" -

(1) the By-Laws as set out following this report be adopted;

(2) all "Associates" of the AIP at the time of the Annual General Meeting be deemed to be "Members" of the AIP; and

(3) the Royal Australian Chemical Institute and the New Zealand Branch of The Institute of Physics shall be recognised as cognate societies.

FINANCE

The Hon. Treasurer reported that a comparison of receipts and payments for the six months ended 31 March 1974 against budget estimates showed them to be close to the situation expected at this time of the year.

Council resolved that subscriptions be increased in 1975 by 5% to those set out in the amended By-Law 29(1) which follows this report. This was the first implementation of the new policy of frequent small increases rather than infrequent larger ones. Its magnitude was determined by the fact that the current subscription assumed an inflation rate of 7% whereas both the Consumer Price Index and Average Weekly Earnings were increasing at about 12%. Should the inflation rate continue as at present, or worsen as some economists predict, Council was warned that a very substantial increase in subscriptions might be necessary in 1976.

ADMINISTRATION

The office shared by the AIP and the Australian Institute of Refrigeration, Air Conditioning and Heating Inc. continued to operate successfully under the new arrangement of a full-time secretary for each Institute and one part-time employee shared equally between the two Institutes.

MEMBERSHIP

The Hon. Registrar reported that the total number of corporate members of the Institute was still increasing although rather slowly. Student members were however remaining static. It was expected that such activities as the National Congress may encourage physicists to join the Institute, and it was hoped that the total corporate membership might reach 2000 by 1978.

Council resolved that the B.App.Sc. (with special requirements as to physics content) awarded by the Western Australian Institute of Technology be recognized as a qualification satisfying the requirements of Clause 9(a) of the Articles of Association relating to Graduateship of the Institute. The B.App.Sc. course awarded by the Canberra College of Advanced Education had been assessed, but a decision to recognize this qualification as satisfying the requirements for Graduateship was deferred until the next Executive Meeting because the written report was not available.
LIST
OF
MEMBERS
1974

Notify all changes to:
Australian Institute of Physics,
Box 52 Parkville, Victoria 3052.
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABBEY, R. L.</td>
<td>Honorary Fellow</td>
<td>School of Physics, University of Melbourne, Parkville, Vic. 3052</td>
</tr>
<tr>
<td>ABRAHAM, R. J.</td>
<td>Fellow</td>
<td>Mount Stromlo Observatory, Mount Stromlo, Canberra, ACT 2600</td>
</tr>
<tr>
<td>ABSON, S. D.</td>
<td>Member</td>
<td>3 Newhall Ave., Moonee Ponds, Vic. 3039</td>
</tr>
<tr>
<td>ACKLAND, R. G.</td>
<td>Graduate</td>
<td>58 Fakenham Rd., Ashburton, Vic. 3147</td>
</tr>
<tr>
<td>ADAMS, C. A.</td>
<td>Fellow</td>
<td>11 Maurice Pl., Garran, ACT 2605</td>
</tr>
<tr>
<td>ADAMS, J. G.</td>
<td>Member</td>
<td>PO Box 236, Woden, ACT 2606</td>
</tr>
<tr>
<td>ANDERLEY, R. E.</td>
<td>Honorary Fellow</td>
<td>Australian Embassy, No. 1-14 Mita 2-Chome, Minato-Ku, Tokyo, Japan</td>
</tr>
<tr>
<td>APEL, Dr F. A.</td>
<td>Fellow</td>
<td>587-A, People's Colony, Extension No. 1, Lyallpur, West Pakistan</td>
</tr>
<tr>
<td>AINSLEE, P. R.</td>
<td>Honorary Fellow</td>
<td>16 Moffatt St., Ipwich, Qld 4305</td>
</tr>
<tr>
<td>AITCHISON, Dr G. J.</td>
<td>Member</td>
<td>Canberra College of Advanced Education, PO Box 381, Canberra City, ACT 2601</td>
</tr>
<tr>
<td>AITCHISON, Professor</td>
<td>Fellow</td>
<td>13 Carron St., Page, ACT 2614</td>
</tr>
<tr>
<td>ALEXANDER, B. J.</td>
<td>Fellow</td>
<td>Physics Division, AAECRE, Lucas Heights, NSW 2232</td>
</tr>
<tr>
<td>ALEXANDER, Dr G. H.</td>
<td>Fellow</td>
<td>75 Moreing Road, Attadale, WA 6156</td>
</tr>
<tr>
<td>ALEXANDER, J. H. F.</td>
<td>Fellow</td>
<td>University of Melbourne, Vic. 3052</td>
</tr>
<tr>
<td>ALEXANDER, L. A.</td>
<td>Fellow</td>
<td>1109 Old Princes Highway, Engadine, NSW 2233</td>
</tr>
<tr>
<td>ALEXANDER, R. K.</td>
<td>Fellow</td>
<td>27 Bell St, West Heidelberg, Vic. 3021</td>
</tr>
<tr>
<td>ANDERSON, Dr R. A.</td>
<td>Fellow</td>
<td>University of Waikato, Melbans, WA 6009</td>
</tr>
<tr>
<td>ANDERSON, Dr S. J.</td>
<td>Fellow</td>
<td>Cybernetic Electronics Group, Weapons Research Establishment, Salisbury, SA 5108</td>
</tr>
<tr>
<td>ANDERSON, T. C.</td>
<td>Fellow</td>
<td>12/6 Bradley St., Randwick, NSW 2031</td>
</tr>
<tr>
<td>ANDERSON, Miss H. E.</td>
<td>Fellow</td>
<td>3 Hillcrest Ave., Gladsvaile, NSW 2111</td>
</tr>
<tr>
<td>ANGELUS, Dr D. E.</td>
<td>Fellow</td>
<td>Gordon Institute of Technology, PO Box 122, G Long, Vic. 3220</td>
</tr>
<tr>
<td>ANTONIOPOULOS, W. G.</td>
<td>Fellow</td>
<td>18 Bingara Ave, Kooyarra 2550</td>
</tr>
<tr>
<td>ARGYROS, Dr J. D.</td>
<td>Fellow</td>
<td>University of London Observatory, Hill Hill Park, London, NW7, UK</td>
</tr>
<tr>
<td>ARMITAGE, F. G.</td>
<td>Fellow</td>
<td>6 Mansfield Pde., Lalor, Vic. 3075</td>
</tr>
<tr>
<td>ARKOTY, R. D.</td>
<td>Fellow</td>
<td>Department of Applied Physics, Capricornia Institute of Advanced Education, PMB 31 MS76, Rockhampton, Qld 4700</td>
</tr>
<tr>
<td>ARTHUR, G. J.</td>
<td>Fellow</td>
<td>105 Centennial Ave., Lane Cove, NSW 2065</td>
</tr>
<tr>
<td>ASHBY, Dr R. A.</td>
<td>Fellow</td>
<td>Department of Chemistry, NSW Institute of Technology, PO Box 123, Broadway, NSW 2007</td>
</tr>
<tr>
<td>ASHCROFT, R. G.</td>
<td>Fellow</td>
<td>School of Physics, Biophysics Section, University of NSW, Kensington, NSW 2033</td>
</tr>
<tr>
<td>ASHTON, H. T.</td>
<td>Fellow</td>
<td>8 The Esplanade, Fairfield, Vic. 3078</td>
</tr>
<tr>
<td>ATKIN, H. J.</td>
<td>Fellow</td>
<td>24 Ross St., Toorak, Vic. 3142</td>
</tr>
<tr>
<td>ATKINSON, J. F.</td>
<td>Fellow</td>
<td>28 Normandy St., Moonee Ponds, Vic. 3039</td>
</tr>
<tr>
<td>ATKINSON, J. F.</td>
<td>Fellow</td>
<td>6/363 Drummond St., Carlton North, Vic. 3054</td>
</tr>
<tr>
<td>AUBURN, R. K.</td>
<td>Fellow</td>
<td>wollongong University College, wollongong, NSW 2500</td>
</tr>
<tr>
<td>AXHIA, A. R.</td>
<td>Fellow</td>
<td>19 zigzag Rd., Eltham, Vic. 3095</td>
</tr>
<tr>
<td>BACON, R. R.</td>
<td>Fellow</td>
<td>Royal Melbourne Institute of Technology, 124 La Trobe St., Melbourne, Vic. 3000</td>
</tr>
<tr>
<td>BADDHAM, C. R.</td>
<td>Fellow</td>
<td>School of Applied Sciences, Canberra College of Advanced Education, PO Box 381, Canberra City, ACT 2601</td>
</tr>
<tr>
<td>BAGCHI, Dr R. N.</td>
<td>Fellow</td>
<td>Physics Department, Gordon Institute of Technology, Warrn Ponds, Vic. 3221 M</td>
</tr>
<tr>
<td>BAGLIANI, F. R.</td>
<td>Fellow</td>
<td>36 Esperance St., East Victoria Park, WA 6101</td>
</tr>
<tr>
<td>BAGNALL, Dr F.</td>
<td>Fellow</td>
<td>Physics Department, University of Newcastle, NSW 2308</td>
</tr>
<tr>
<td>BAHR, Dr J. L.</td>
<td>Fellow</td>
<td>Physics Department, University of Otago, PO Box 56, Dunedin, NZ</td>
</tr>
<tr>
<td>BAILLEY, D. E.</td>
<td>Fellow</td>
<td>NSW Institute of Technology, Harris St., Ultimo, NSW 2007</td>
</tr>
<tr>
<td>BAILLEY, Dr I. H.</td>
<td>Fellow</td>
<td>Department of Physics, WA Institute of Technology, Hayman Rd., Bentley South, WA 6102</td>
</tr>
<tr>
<td>BAILLEY, J. E.</td>
<td>Fellow</td>
<td>53 Wattle St., Haberfield, NSW 2045</td>
</tr>
<tr>
<td>BAIN, Dr F. J.</td>
<td>Fellow</td>
<td>Division of Textile Physics, 338 Blaxland Road, Ryde, NSW 2112</td>
</tr>
<tr>
<td>BAKER, Dr S. C.</td>
<td>Fellow</td>
<td>4 Aldyth St., New Lambton, NSW 2305</td>
</tr>
<tr>
<td>BAKR, J. D.</td>
<td>Fellow</td>
<td>Physics Department, University of Newcastle, NSW 2308</td>
</tr>
<tr>
<td>BALL, Miss S. N.</td>
<td>Fellow</td>
<td>49 Richmond St., Maryborough, Qld 4650</td>
</tr>
<tr>
<td>BAILLARD, A. W.</td>
<td>Fellow</td>
<td>Applied Physics Department, Ballarat Institute of Advanced Education, Lydiard St South, Ballarat, Vic. 3350</td>
</tr>
<tr>
<td>BALDONIS, V.,</td>
<td>Fellow</td>
<td>CSIRO, PO Box 310, South Melbourne, Vic. 3205</td>
</tr>
</tbody>
</table>

114 The Australian Physicist, July 1974
FLINT, P. H., 8 Wilaroo Ave, Beaumont, SA 5066
G

POLAK, Dr W. M., Weapons Research Establishment, Salisbury, SA 5108
G

FOOK, Dr R., Chemistry Department, University of
St

NSW, PO Box 1, Kensington, NSW 2033
S

FORREST, D., 74 Yilgilly Rd, Strathmore,
M

Vic. 3041

FOREY, M. A. L., 67 Walker Cres., Campbell,
G

ACT 2601

FORWOOD, Dr C. T., CSIRO, Division of Trigo-
M

physics, University of Melbourne, Parkville, Vic.
3052

POSTER, W. M., Lawley House, Brisbane Ave,
M

Barton, ACT 2600

FOWLER, Dr W. K. T., Department of Medicine,
G

University of Sydney, NSW 2006

FOX, Dr J. R., Department of Physics, University of
M

Tasmania, GPO Box 252C, Hobart, Tas. 7001

FRANCY, Dr J. L. A., Physics Department,
M

Monash University, Clayton, Vic. 3168

FRANCIS, G. W., PO Box 80, Lindfield, NSW 2070
St

FRASER, B. J., 8 Linda Crescent, Hawthorn,
G

Vic. 3122

FRASER, Dr R. L. B., CSIRO, Division of Protein
P

Chemistry, 343 Royal Pde, Parkville, Vic. 3052

FRASER, S., 15 Ebbena Ave, Mentone, Vic. 3194
St

FREEDMAN, D. R., Preston Institute of Technology,
M

St George's Road, Preston, Vic. 3072

FREESTON, D. B., 4 Raywood Pl, Avalon, NSW 2107
St

FRICHE, Dr J. E., Metallurgy Division, Defence
M

Standards Laboratories, PO Box 50, Ascot
G

Vale, Vic. 3032

FROST, H. J., 230 The Boulevard, Ivanhoe,
F

Vic. 3079

FROST, W. J., 54 Pembroke St, Carina, Qld 4152
St

FULLER, G. S., 1A Lymburn Pl, Wattle Park,
M

SA 5066

FURINA, R., 174 Brown St, East Perth, WA 6000
G

FYFE, I. K., 1 Waratah Dr, Carina, Qld 4157
St

GALLAGHER, E., Julius Kruttschnitt Mineral
G

Research Centre, Department of Mining and
St

Metallurgy, University of Qld, St Lucia, Qld 4067

GAMBLING, Dr D. J., Night Vision Group, Bldg 81,
G

Labs Area, WBB, Salisbury, SA 5108

GAMESON, J. J., 98 Womma Rd, Ringwood, Vic. 3134
M

GARDE, R. N., Dynavac High Vacuum Pty Ltd, PO
M

Box 133, Burwood, Vic. 3125

GARDENER, J. D. P., Bureau of Mineral Resources,
S

PO Box 378, Canberra City, ACT 2601

GARDINER, Dr R. B., Department of Physics,
G

University of Qld, St Lucia, Qld 4067

GARDINI, A., General Studies Department, SA
M

Institute of Technology, North Terrace,
G

Adelaide, SA 5000

GARDNER, B. P., Applied Physics Department,
G

Ballarat Institute of Advanced Education, Gear
St

Ave, Mt Helen, Vic. 3350

GARDNER, Dr J. L., Physics Department, University
M

of Nebraska, Lincoln, Nebraska, 68508 USA

GARNER, Dr R. K., Defence Standards
M

Laboratories, PO Box 50, Ascot Vale, Vic. 3032

GARRETT, Mr C, School of Physics, University of
M

Melbourne, Parkville, Vic. 3052

GASHO, Dr R. L., 7 Domino Cr, Glen Waverley,
F

Vic. 3150

GARTRELL, Dr G., 45 Marlborough St, Brighton,
G

SA 5048

GASCOIGNE, J., Research School of Physical
S

Sciences, Australian National University,
G

PO Box 4, Canberra, ACT 2600

GASMIER, D. M., 4 Malambo Cres, Kalumburu, WA, 6076
G

GAYES, A. D., 70 Bungaree Rd, Wilson, WA 6107
St

GAYLID, Dr C. P., 38 Mooramee Ave, Kensington,
M

NSW 2033

GAZIZAD, A. D., 102 L'Estrange Terrace, Kelvin
G

Grove, Qld 4059

GEMMILL, W., Division of Physics, AECRE, Private
M

Mail Bag, Sutherland, NSW 2232

GEROGGE, D. F. M., Watson Victor Ltd, 155 Tynte
M

St, North Adelaide, SA 5006

GEBGEO, Professor D. W., Department of Mechanical
S

Engineering, The University of Sydney, NSW 2006

GERGARD, Professor E. J., School of Physics,
M

University of NSW, PO Box 1, Kensington, NSW
F

2033

GEORGE, S., 8D/337 Bronte Rd, Waverley, NSW 2024
G

GERGARD, C. M., ETS Group, Weapons Research
M

Establishment, Salisbury, SA 5108

GIBBONs, Rev. Dr T. M., Rostrevor College,
G

Woodoore, Qld 5072

GIBBS, W. E. M., Defence Standards Laboratories,
M

PO Box 50, Ascot Vale, Vic. 3032

GIBSON, Dr D. K., Health Physics Research
M

Section, AECRE, Private Mail Bag, Sutherland,
G

NSW 2232

GIBSON, G. M., 17 Archibald St, Pascoe Vale, Vic.
M

3044

GIBBONSWIILE, B. C., Physics Department, James
G

Cook University, Qld 481

GIFKINS, Dr K. J., Research Laboratory, Kodak
M

(A'asia) Pty Ltd, 173 Elizabeth St, Coburg,
G

Vic. 3058

GILBERT, B. W., C/- Dimbushac Sec. Department,
M

Dimbusha, Qld 4872

GILBERT, N. B., Fremantle Technical College,
G

Fremantle, WA 6160

GILLESPIE, P. C., Defence Standards Laboratories,
G

SA Branch, Woodville North, SA 5012

GILLIN, Dr L. M., Defence R & D Attaché, Embassy
M

of Australia, 1601 Massachusetts Ave N.W.,
Washington D.C. 20036, USA

GILJINGHAM, D. E. M., Communications Section,
M

South Brisbane Technical College, 91

Merivale St, South Brisbane, Qld 4101

GLOERNEILL, Dr R. G., National Standards Labora-
S

tory, University Grounds, Chippendale, NSW 2008

GIPPS, Dr G. deV, 1 Garrick St, St Ives, NSW
M

2075

GIRODYNNIK, Dr J. E., School of Physics, Univer-
F

sity of NSW, PO Box 1, Kensington, NSW 2033

GLADWIN, Dr M. T., 6/68 Crosby Rd, Albion, Qld
G

4010

GOARD, P. R.C., CSIRO Mineral Research
G

Laboratories, PO Box 136, North Ryde, NSW 2113

GOBLE, O. L., Kodak (A'asia) Pty Ltd, 173
G

Elizabeth St, Coburg, Vic. 3058

GOFFREY, Professor G. M., "Severn", 1/13 Baden
F

Road, Neutral Bay, NSW 2089

GOLD, E., Applied Physics Department, Royal
M

Melbourne Institute of Technology, 124

LaTrobe Street, Melbourne, Vic. 3000

GOLDBERG, R., Physics Department, IAS,
M

Australian National University, PO Box 4,
S

Canberra, ACT 2600

GOLDING, J. R., Found Rd, Warrandyte, Vic. 3132
S

GOLMANN, G. R., 18 Northcote Ave, Caulfield,
M

3161

The Australian Physicist, July 1974 121
<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>City, State, Zip</th>
</tr>
</thead>
<tbody>
<tr>
<td>HONE, G.J., C/- ARM Ltd, GPO Box 1643,</td>
<td>Melbourne, Vic. 3001</td>
<td></td>
</tr>
<tr>
<td>HOWLET, A.M., 34 Margaret St, Moe, Vic. 3825</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOWER, S.B., 11 Parkside Ave, Mt Pleasant, WA 6153</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOY, R.D., Bureau of Meteorology, GPO Box 1298K,</td>
<td>Melbourne, Vic. 3001</td>
<td></td>
</tr>
<tr>
<td>HSANG, Dr. F.C.P., Computer Centre, University of Newcastle, NSW 2308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUDSON, S.B., PO Box 161, Lismore, NSW 2480</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUGHES, J.R.D., 77 Bulkara Rd, Bellevue Hill, NSW 2023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUGHES, D.G., 8 Wadsley Cres., Connells Point, NSW 2221</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUMBLE, Dr F., CSIRO, Division of Biophysics, University of Melbourne, Parkville, Vic. 3052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUMPHRIES, J.W., National Standards Laboratory, University Grounds, Chippendale, NSW 2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUNT, A.J., CEIRG, Division of Radiophysics, Box 76 PO, Epping, NSW 2121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUNTER, Dr W.F., RANRE, Garden Island, Sydney, NSW 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUNLEY, Dr A.C., CSIRO, Division of Chemical Physics, PO Box 160, Clayton, Vic. 3168</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUNTER, Dr. C.P., Dept of Mathematical Physics, University of Adelaide, Adelaide, SA 5001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HUXLEY, Sir Leonard, KBE, 19 Glasgow Pl., Hughes, Canberra, ACT 2605</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDOWURU, Dr M., Bureau of Mineral Resources, Parkes Way, Canberra, ACT 2601</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INGRAM, A.D., 30 Wallala Ave, Parkesdale, SA 5043</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISAAC, Dr G.R., Dept of Physics, The University, Birmingham 15, England</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISOPENKO, S., 9 Kealanta St, Withers, WA 6322</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JACKA, Dr F.J., Dawson Institute for Antarctic Research, University of Adelaide, Adelaide, SA 5001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JACOBS, Professor J.C., Private Bag 5 PO, Sorell, Tas. 7172</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAMES, Dr B.W., School of Physics, University of Sydney, NSW 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAMES, J.F.P., CSIRO, Division of Textile Physics, 336 Buxton Rd, Ryde, NSW 2112</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAMES, Dr V.J., Physics Dept, University of NSW, PO Box 1, Kensington, NSW 2033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JASPER, J.D., 54 Windsor Crescent, Bundooloora, Vic. 3083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JEFFREY, Dr P.M., Dept of Physics, University of WA, Nedlands, WA 6009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JEFFREY, Z.R., Bldg 24 Labs, WRE, Box 2151, GPO, Adelaide, SA 5001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JENKIN, Dr J.C., School of Physical Sciences, LaTrobe University, Bundooloora, Vic. 3083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JENKINSON, Dr I.H., 81 Carina Rd, Oyster Bay, NSW 2225</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JENKS, Dr G.J., Defence Standards Laboratories, PO Box 50, Ascot Vale, Vic. 3102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JESSEN, P.E., Bureau of Meteorology, Box 1298K, GPO, Melbourne, Vic. 3001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JESSUP, P.V., 41 Victoria St, Epping, NSW 2121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOANNOU, A., School of Elect. Eng., North Sydney Technical College, Pacific Highway, Gore hill, NSW 2065</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHNSON, A.C.H., SA Institute of Technology, Nicholson Ave, Whyalla, SA 5608</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHNSON, Dr B.D., School of Earth Sciences, Macquarie University, North Ryde, NSW 2113</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHNSON, J.R., Macquarie University, North Ryde, NSW 2113</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHNSON, G.J., School of Elec. Eng., University of NSW, PO Box 1, Kensington, NSW 2033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHNSTON, Dr G.P., Kodak (Australia) Pty Ltd, 173 Elizabeth St, Coburg, Vic. 3058</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHNSTON, Dr I.D., Physics Dept, University of Sydney, NSW 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOLLY, D., Defence Standards Laboratories, Box 1931P, GPO, Adelaide, SA 5001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONAS, M.S., 45 Howe St, Singleton, NSW 2330</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONES, B.G., 21 Alfred St, Roselle, NSW 2039</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONES, C.J., 36 Anthony Ave, Doncaster, Vic. 3108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONES, Dr K.L., Physics Dept, University of Qld, St Lucia, Qld 4067</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONINE, Miss E.L., C/- Garran Hall, Australian National University, PO Box 813, Canberra ACT 2601</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONES, N., Gldg 32, Labs Area, WRE, Salisbury, SA 5128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONES, T.J., 7 Nevell Ave, Riverton, WA 6155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONES, T.P., National Standards Laboratory, University Grounds, Chippendale, NSW 2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JONES, W.R., Dept of Medical Physics, Royal Perth Hospital, Wellington St, Perth, WA 6000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JORY, Dr R.L., Canberra College of Advanced Education, PO Box 391, Canberra, ACT 2601</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOSHI, Dr R.C., School of Physics, University of Melbourne, Parkville, Vic. 3052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOYCE, A.P., 369 Marmion St, Melville Heights WA 6156</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOYCE, A.M.R., Physics Dept SQS, Australian National University, Canberra, ACT 2600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOYNT, R.C., Herman Central Scientific Lab., Howard St, Richmond, Vic. 3121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KAROLIS, C., Radiotherapy Dept, Prince of Wales Hospital, High St, Randwick, NSW 2031</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KASALINSK, Dr V., School of Physics, University of NSW, PO Box 1, Kensington, NSW 2033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KATIEFIDES, M., 119 Ernest St, Innisfail, QLD 4860</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KAYE, Dr. A.S., Qld Lab. Abingdon, Berks, UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KIRKING, W.G., 8 Ronald St, Box Hill Neth, Vic. 3129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEDAY, Professor C.S.L., Physics Dept, University of Newcastle, NSW 2308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENNETH, M., 29/8 Eyres St, Dundas, NSW 2117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KELLY, B.P., Physics Dept, McMaster University, Hamilton, Ontario, Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KELLY, P.F., Dept of Physics, University of Qld, St Lucia, QLD 4067</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KELLY, Professor J.C., The University of Sussex, School of Physics, Falmer, Brighton, BN1 9QH UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KELLY, Dr J.W., 424 Port Hacking Rd, South Caringbah, NSW 2229</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KELLY, Dr P.M., AARCPS, Private Mail Bag, Sutherland, NSW 2232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEMP, R.E., Physiology Dept, University of Melbourne, Parkville, Vic. 3052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEMP, Dr R.C., National Standards Laboratory, University Grounds, Chippendale, NSW 2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEMP, W.R.G., National Standards Laboratory, Chippendale, NSW 2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENNEDY, G.M.D., 52 Smith St, Mayfield East, NSW 2304</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENNEDY, M.R., 212 Waverley Rd, East Malvern, Vic. 3145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENNEDY, P.A., 2 Lillian St, Berala, NSW 2141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENNY, Dr B.G., School of Physics, University of Sydney, NSW 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENNY, M.B., Physics Dept, Cancer Institute, 278 William St, Melbourne, Vic. 3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENNY, Dr M.J., Physics Division, AARCPS, Private Mail Bag, Sutherland, NSW 2232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KENT, R.D., Dept of Physics, RMIT, 124 LaTrobe St, Melbourne, Vic. 3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEREN, Dr J., Physics Dept, Northwestern University, Evanston, Illinois, 60201, USA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MORRIS, Dr J.M., Dept of Medical Physics, Prince Henry's Hospital, St Kilda Rd, Melbourne, 3004
MORRIS, D.J., 6 Weir Pl., Bateman, WA 6153
MORTLOCK, Dr A.J., Physics Dept, ANU, PO Box 4, Canberra, ACT 2600
MORTON, Dr A.H., ANU, PO Box 4, Canberra, ACT 2600
MORTON, Professor D.H., Dept of App. Physics, University of NSW, PO Box 1, Kensington, 2033
MORTON, F.W., Physics Dept, LaTrobe University, Burncova, Vic. 3081
MOES, Miss S.J., 2/45 Rainbow St, Kingsford, 2032
MOULTON, M.J., 1 Pearl Ave, Epping, NSW 2121
Moye, D.G., 36 Sylvander St, North Balwyn, 3104
MURFORD, J., 145 Wattle St, Punchpowl, NSW 2196
MUFFATI, A.H.J., Bureau of Meteorology, Box 1289K, Melbourne, Vic. 3001
MUGGLESTONE, Professor D., Physics Dept, University of QLD, St Lucia, Qld 4067
MUINHEAD, Dr E.G., School of Physics, University of Melbourne, Parkville, Vic. 3052
MUIR, J.M., Bureau of Mineral Resources, Box 378, Canberra City, ACT 2601
MULLEARN, Rev. Fr. G.J., St Pius X College, Adamaest, NSW 2289
MULLELLY, Dr R.F., 31 Eden Ave, Turrumarru, NSW 2074
MULLINS, R.P., 28A Queen Victoria St, Ballarat, Vic. 3350
MULLER, R.G., 4 Princess Rd, Claremont, WA 6010
MUNCH, Dr W.R., CSIRO Division of Building Research, PO Box 56, Highett, Vic. 3190
MUNRO, Dr G.H., School of Elec. Engineering, University of Sydney, NSW 2006
MUNSELLO-DAVIES, L., State X Ray Lab., Vedun St, Shenton Park, WA 6008
MURDOCH, Dr H.S., C/- School of Physics, University of Sydney, NSW 2006
MUSPER, A.J., 7 Parsons Rd, Eltham, Vic. 3095
MURRAY, Dr A.P., Marist Fathers, Fitzwilliam Rd, Toongabbie, NSW 2146
MURRAY, A.S., Bureau of Mineral Resources, PO Box 378, Canberra, ACT 2601
MURRAY, Dr E.L., School of Physical Sciences, Flinders University, Bedford Park, SA 5042
MURRAY, G.L., Dept of Public Works, State Office Block, Phillip St, Sydney, NSW 2000
MYINT, X., Asst. Lecturer in Physics, Arts-Science University, Mandalay, Burma
NANKIVELL, J.P., Sandra Ave, Eltham, Vic. 3095
NATH, N., Dept of Science, Patents Office, Woden, ACT, 2606
NATIONAL, G.S., The Open University Research Unit, 11/12 Bevington Rd, Oxford, England
NELSON, Dr G.J., CSIRO Solar Observatory, PO Box 94, Narrabri, NSW 2390
NESTERSCOTT, Dr R.B., Materials Division, Aeronautical Research Labs PO Box 4331, Melbourne, Vic. 3001
NETTERFIELD, Dr R.P., CSIRO, National Standards Laboratory, Chippendale, NSW 2008
NEWLING, D.R., 22 Randall Pde, Adamant Heights, NSW 2289
NEWMAN, Dr I.A., Physics Dept, University of Tas., GPO Box 252C, Hobart, Tas. 7001
NEWTON, C.B., Nuclear Physics Dept, ANU, PO Box 4, Canberra, ACT 2600
NEWTON, Professor J.O., Dept of Nuclear Physics, IAS, ANU, PO Box 4, Canberra, ACT 2600
NEWTON, M.G., Mt Lawley Technical College, Harold St, Perth, WA 6000
NICHOLAS, J.P., CSIRO Division of Building Research, Graham Rd, Highett, Vic. 3190
NICHOLS, F.G., IUCN, 1110 Morges, Switzerland
NICHOLS, T.I., 1 Atlantic Ave, Restor evacuated, SA 5073
NICHOLSON, Dr A.F., 34 Prescott St, Farrer ACT 2607
NICHOLSON, R.G., Room 6N, Brassey House, Macquarie St, Barton, ACT 2600
NICKOL, J.L., Dept of Physics, James Cook University of North Queensland, Townsville, QLD 4810
NICKOL, A., School of Physics - Redmond Barry Bldg, University of Melbourne, Parkville, Vic. 3052
NIMMO, J.K., Physics Dept, University of Qld, St Lucia, Qld 4067
NOBBS, J. McK., DEL, Woodville North, SA 5012
NOBLE, S.H., 13 Ross St, Kew, Vic. 3101
NOHAN, S.J., 32 Winston Ave, Clarence Gardens, SA 5039
NOOK, Dr J.H., Dept of Physics, Florida Technological University, Box 25,000, Orlando, Florida 32816, USA
NORKISH, Dr K., CSIRO, Division of Soils, Private Bag No. 1, Glen Osmond, SA 5064
NOVAK, M., School of Chemistry, University of NSW, PO Box 1, Kensington, NSW 2033
O'BRIEN, R., Physics Dept, State College of Vics. at Melbourne, Grosvenor St, Carlton, Vic. 3053
O'BRIEN, R.S., Physics Dept, University of Adelaide, Adelaide, SA 5001
O'CONNELL, Dr A.M., CSIRO, Division of Land Resource Management, Private Bag, PO, Wembley, WA 6014
O'CONNOR, Dr B.H., Dept of Physics, WA Institute of Technology, Hayman Rd, Bentley 5th, WA 6102
O'CONNOR, G.G., OAK, Bldg 241 AD, WRI, Salisbury, SA 5108
O'CONNOR, K.D., C/- 263 Lyons Rd, Dernam Court, SA 5075
O'CONNOR-BYRNE, M.D., Glenroy High School, Hilton St, Glenroy, Vic. 3046
ODDIE, Dr T.H., 30 Pinehurst Circle, Little Rock, Arkansas 72207, USA
OGLIVIE, Dr G.J., CSIRO, Division of Tribophysics, University of Melbourne, Parkville, Vic. 3052
O'HALLORAN, P.M., C/- School of Physics, University of NSW, PO Box 1, Kensington, NSW 2033
OTYMAA, Dr J., School of Physics, University of NSW, PO Box 1, Kensington, NSW 2033
O'KEEFE, M.A., CSIRO, Division of Tribophysics, University Grounds, Parkville, Vic. 3052
OELEARY, B.M., Physics Dept, Qld Institute of Technology, G.R.S., Qld 4000
OLIFF, Sir Mark, Government House, Adelaide, SA 5000
OLIFF, Mrs M.V., 23 Riverside Ave, Bedford Park, SA 5042
OLIVER, L.D., Physics Dept, Prince of Wales Hospital, High St, Randwick, NSW 2031
OLoughlin, Flt Lt K.J., Met. Section RAAF, Air Base Butterworth, c/- GPO, Penang, Malaysia
OMAHONY, G., Aust. Administrative Staff College, Kunyung Rd, Mt Eliza, Vic. 3930
OMARA, Dr B.J., Physics Dept, University of Qld, St Lucia, Qld 4067
OPAT, Professor G.I., School of Physics, University of Melbourne, Parkville, Vic. 3052
ORELLI, R.J., 26 Monash Ave, Belair, SA 5052
O'SBORNE, Dr C.P., 14 St John's Wood Rd, Mt Waverley, Vic. 3149
OSMAN, Dr C.R., C/- The National Bank of A'sia Ltd, Strand Branch, Australia House, London WC2N
O'SULLIVAN, R.J., 19 Alvan St, Mt Lawley, WA, 6050

128 The Australian Physicist, July 1974
POTT, R.J., 122 Mackie St, Kensington, WA 6151
POWELL, Dr C.J., Meteorology B-214, National Bureau of Standards, Washington DC 20234 USA
POWELL, Dr D.L., Dept of Science, PO Box 826, Woden, ACT 2606
POWELL, K.R., C/- CIG Ltd, 90 Bell St, Preston, Vic. 3072
POWELL, W.D., C/- West Australian Petroleum Pty Ltd, GPO Box C 1580, Perth, WA 6001
POWELL-DAVIES, N.W., Launceston Church of England Grammar School, Launceston, Tas. 7250
PRAGER, Dr P.A., Dept of Physics, University of New England, Armidale, NSW 2351
PRATT, G.J., Dept of Industrial Science, University of Melbourne, Parkville, Vic. 3052
PRATT, H.C., 275 Warrigal Rd, Burwood, Vic. 3125
PRESCOTT, Professor J.R., Physics Dept, University of Adelaide, Adelaide, SA 5001
PREST, Br N.J., Marist Brothers, St Gregory’s College, Campbelltown, NSW 2560
PRICE, D.A., 22 Second Ave, Epping, NSW 2121
PRICE, D.C., Dept of Physics, University of Liverpool, Liverpool L69 3BX, UK
PRICE, D.M., 60 Arndell St, Macquarie, Belconnen, ACT 2614
PRICE, G, School of Math. & Phys. Sciences, Palmerston, NT, Australia
PRICE, R.E., Dept of Physics, University of Technology, Hayman Rd, Bentley St, WA 6102
PRICE, T.C., Physics Dept, EMIT, 124 La Trobe St, Melbourne, Vic. 3000
PRICE, T.E., BHP Central Research Labs, Shortland, NSW 2307
PRICE, Dr C.H.B., CSIRO, Environmental Physics Research Labs, Station St, Aspendale, Vic.3195
PRINCE, J.A., 20 First St, Camp Hill, Qld 4152
PRIOR, L.S., 44/Block C, Currajong Flats, Braddon, ACT 2601
PROSSER, M.T., Burnie High School, Fiddler St, Burnie, Tas. 7320
Prowse, Dr D.B., Defence Standards Labs, PO Box 50, Ascot Vale, Vic. 3024
PYCOR, Dr A.W., Airborne, Private Mail Bag, Sutherland, NSW 2232
PYCOR, T.L., 126 York St, Bedford, WA 6052
PUD, R.F., 166 Blackburn Rd, Blackburn, Vic.3130
PULPORD, A.G., 154 Victoria Rd, Bellevue Hill, NSW 2023
PUTT, Dr G.D., Physics Dept, University of Auckland, Private Bag, Auckland, NZ
PUTRIDGE, M.J., National Standards Laboratory, University Grounds, Chippendale, NSW 2008
PYBUS, A.W., 41 Harrow Rd, Somerton Park, SA 5044
PYKE, J.R., Ionospheric Prediction Service, PO Box 702, Darlington, NSW 2010
PYLE, Mrs C.L., 63 Gouger St, ACT 2607
PYLE, H.A.A., Brynnvalt Unit 13, 10 Mount St, Hunters Hill, NSW 2110
PYLE, J.R., 63 Gouger St, Mawson, ACT 2607
QUEEN, J.M., Murrumbeena School, Murrumbeena Rd, Murrumbeena, Vic. 3174
QUilty, J.H., Bureau of Mineral Resources, Geoscience Australia, Acton Park, ACT 2601
QUINLAN, Br C, St Vincent's Boys' Home, Westmead, NSW 2145
QUINN, J.D., 48 First Ave, East Keal, Vic. 3102
RACHINGER, Professor N.A., Dept of Physics, Monash University, Clayton, Vic. 3168
RACKHAM, S.J., Physics Dept, Swinburne College of Technology, John St, Glenferrie, Vic. 3122
RADOSLOVICH, Dr E.W., CSIRO, Division of Soils, Private Bag No. 1, Glen Osmond, SA 5064
RAJNIBHAR, A.P., Dept of Science, PO Box 449, Woden, ACT 2606
RAMM, Dr C.A., Dean, Faculty of Science, University of Melbourne, Parkville, Vic. 3052
RAMESY, Dr J.V., Division of Physics, National Standards Lab., University Grads, Chippendale NSW 2008
RAMESY, Dr J.A., University of Newcastle, NSW 2308
RAPKINS, G.E., 2/26 Thorne St, Windsor, Qld 4030
RATHBUN, Dr H.D., 11 Lookout Ave, Dee Why, 2099
RASMUSSEN, Dr M.R., 135 Stutterly Rd, Heidelberg, Vic. 3084
RAWSON-HARRIS, Mrs B., C/- Mrs M.F. Madsen, 85 Oxbridge St, Grange, Qld 4051
RAYMOND, Dr O.J., Defence Science Div., Dept of Defence, Russell Offices, Canberra, ACT 2600
RAYNER, J.M., 5 Tennyson Crescent, Forrest, ACT 2603
RAYNER, Dr J.D., 25 Bamford St, Hughes, ACT 2605
RAYNER, P.T., 1/36 Melilfont St, West Hobart 7000
READ, B.J., School of Physics, University of Melbourne, Parkville, Vic. 3052
READ, R., Dept of Geology, University of Adelaide, SA 5001
REEF, Miss E.M., School of Physics, University of Melbourne, Parkville, Vic. 3052
REID, I.D., Garran Hall, ANU, PO Box 813, Canberra City, ACT 2601
REIMANN, Professor A.L., Dept of Physics, University of Qld, St Lucia, Qld 4067
REINDE, Miss V.A., 39 Gilroy Rd, Turramurra 2074
REYNOLDS, Fr J.G., St John's College, PO Box 6, Lismore, 2480
REYNOLDS, S.M., 8 Hosking Pl, Melba, ACT 2615
RICHARD, W.D., 40 Wood St, Millwood, WA 6034
RICHARDSON, D.B., Research School of Phys. Sciences, ANU, PO Box 4, Canberra, ACT 2600
RICHARDSON, Mrs E.M., 35 Dickinson St, Watson, ACT 2602
RICHARDSON, J.A., Aust. Radiation Lab., 36 Lonsdale St, Melbourne, Vic. 3000
RICHARDSON, P.A., Devonport High School, Best St, Devonport, Tas. 7310
RICHARDSON, R.G., Geology Dept, University of Tas., GPO Box 252C, Hobart, Tas. 7001
RIDGWAY, Dr J.W.T., 11 Ogala St, Belrose, 2085
RIGGUTT, M/H, Monash University, Clayton 3168
RIGBY, Dr B.J., Physics Dept, Qld Institute of Technology, PO Box 246, North Quay, Qld 4000
RIMMER, R.J., 38 Clyde St, Diamond Creek, 3089
RIPPER, I.D., Geophysical Observatory, PO Box 321, Port McEwan, TPG
ROBERTS, J.G., Physics Dept, Bendigo Institute of Technology, McCrae St, Bendigo, Vic. 3550
ROBERTS, R.A., Physics Dept, EMIT, 124 La Trobe St., Melbourne, Vic. 3000
ROBERTSON, Dr A.J., 70 Mitchelmore St, Wagga, NSW 2650
ROBERTSON, Dr D.F., Physics Dept, University of Qld, St Lucia, Qld 4067
ROBERTSON, Dr D.S., "Harconika", Milan Tce, Stirling, SA 5152
ROBERTSON, Dr G.B., Entomology Dept, WATTLE Agricultural Research Institute, Glen Osmond, 5064
ROBINS, Dr B.W., 2 Bent St, Lindfield, NSW 2070
ROBINS, Dr J.L., Dept of Physics, University of WA, Nedlands, WA 6009
ROBSON, Dr B.J., CSIRO, Division of Radiophysics, PO Box 76, Epping, NSW 2121
TAYLOR, D.R. B., Physics Dept, James Cook University of Northern Qld, Townsville, Qld 4810
TAYLOR, R.G.S., 125 Pring St, Tarragindi, Qld 4121
TAYLOR, R.J., CSIRO, Div. of Atmospheric Physics, Station St, Aspendale, Vic. 3195
TAYLOR, R.L., Educational Development Dept, Footscray Institute of Technology, Ballarat Rd, Footscray, Vic. 3011
TEMKIN, J.L., C/- Cyclotron, School of Physics, University of Melbourne, Parkville, Vic. 3052
TERRY, D.K., Dept. of Physics, WA Institute of Technology, Hayman Rd, Bentley 5th, WA 6102
TURBNER, D.R., School of Physical Sciences, Flinders University, Bedford Park, SA 5042
TATCHELL, J.D., Science Dept, Mitchell College, Bathurst, NSW 2795
THICKERGOM, G.W., C/- St George's College, Crawley, WA 6009
THIEL, D.V., Physics Dept, James Cook University of Northern Qld, Townsville, Qld 4810
THIEL, D.R.H., Dept. of Physics, University of WA Nedlands, WA 6009
THOMAS, A.B., 45 Greengate Rd, Killara, NSW 2071
THOMAS, A.R., C/- 116 Stuart St, Inglewood 6052
THOMAS, D.R., Dept. of Physics, WA Institute of Technology, Hayman Rd, Bentley 5th, WA 6102
THOMAS, D.J.A., Physics Dept (RAAF Academy), University of Melbourne, Parkville, Vic. 3052
THOMAS, D.L., Dept. of Physics, University of Melbourne, Parkville, Vic. 3052
THOMAS, D.R.M., Dept. of Physics, University of Sydney, PO Box 256C, Hobart, Tas. 7001
THOMAS, M., School of Physical & Life Sciences, NSW Institute of Tech., Thomas St, Broadway 2007
THOMPSON, F.R., RAN College, Jervis Bay, NSW 2540
THOMPSON, R.J., Astronomy Dept, School of Physics, University of Sydney, NSW 2006
THOMSON, A.A., 24 Hopkins Ave, Keilor, Vic. 3036
THOMSON, B.J., App. Physics Dept, Footscray Institute of Technology, PO Box 64, Footscray, 3011
THOMSON, G.B., Gordon Institute of Technology, Seelong, Vic. 3220
THOMSON, K.A., Avondale College, Cooranbong, NSW 2265
THORNE, S.W., 12 Green St, Canberra, ACT 2600
THURSTON, D.B., 151 Corinthian Rd, Riverton, WA 6155
THULBORN, Mrs E.V.E., 12 McKay Ave, Black Rock, Vic. 3193
THUNATE, A.G., National Standards Laboratory, University Grounds, Chippendale, NSW 2008
THYER, D.R.W., App. Physics Dept, Ballarat Institute of Advanced Education, Ballarat, 3350
THYER, R.P., 13 Colvin St, Hughes, ACT 2605
TIBBALS, J.E., Fysik Institutet, Universitetslet I Oslo, PO Box 1048, Blindern, Oslo 3, Norway
TIMMEL, R.E., Canberra College of Advanced Education, PO Box 381, Canberra, ACT 2601
TINDALL, R.G., Adelaide College of Advanced Education, Kintore Ave, Adelaide, SA 5000
TINKEL, A.E., Dept. of Physics, Monash University, Clayton, Vic. 3168
TISHER, D.R.P., Faculty of Education, University of Qld, St Lucia, Qld 4067
TOBIN, K.G., 131 Abbett St, Scarborough, WA 6019
TORBIN, R.J., Dept. of Physics, Monash University, Clayton, Vic. 3168

The Australian Physicist, July 1974

133
TOMLIN, Dr S.G., Physics Dept, University of Adelaide, Adelaide, SA 5001
TORDOFF, W.H., Physics Dept, University of Adelaide, Adelaide, SA 5001
TOWARDS, P.R., 19 Erinnbee St, Riverton, WA 6155
TOWERS, Dr G.R., Aeronautical Research Labs, GPO Box 4331, Melbourne, Vic. 3001
TOWLE, C., 34 Cynthia St, Flora Hill, Bendigo, 3550 M
TOWNSEND, P.N., RMIT, 124 La Trobe St, Melbourne 3000 N
TOMSON, Mrs J.E., C/- Dept Nuclear Medicine, Royal Prince Alfred Hospital, Camperdown, NSW 2050 M
TROJAN, R.J., 13 Caranagh St, Chelelton, Vic. 3192 G
TREACY, Dr B.B., Research School of Physical Sciences, ANU, PO Box 4, Canberra, ACT 2600 P
TREILLY, G.R., 26 Leicester Ave, Glen Waverley, Vic. 3150 G
TREFFREDE, R.J., Qld Institute of Technology, George St, Brisbane, Qld 4000 M
TRETHWIE, J.W., C/- AND Bank, 20 Grafton St, London, Wi UK G
TROPP, G.J., Dept of Physics, Monash University, Clayton, Vic. 3168 C
TSANG, C.P., Physics Dept, University of WA, Nedlands, WA 6009 M
TUCK, G.J., Physics Dept, University of Qld, St Lucia, Qld 4067 C
TUCKER, Dr D.H., CSIRO, Division of Atmospheric Physics, PO Box 77, Mordialloc, Vic. 3195 P
TUCKER, Dr D.H., C/- Bureau of Mineral Resources, Box 378, Canberra, ACT 2601 C
TURK, M.H., 18/216 Blues Pd Rd, North Sydney, NSW 2060 G
TURNER, H.J., 15 Penshurst Ave, Penshurst, NSW, 2222 M
TURNER, J.F., C/- Ionospheric Prediction Service, Div. PO Box 702, Darlington, NSW 2010 M
TURNER, Dr J.S., Dept of App. Math and Theoretical Physics, Silver St, Cambridge, UK M
TURNER, Dr P.S., Dept of Physics, The University of Alberta, Edmonton 7, Canada M
TURNER, R.L., 18 Cambridge Dve, Springvale South, Vic. 3172 G
TURPIL, A., Bureau of Mineral Resources, PO Box 378, Canberra, ACT 2601 G
TYTLER, R.W., Melbourne College of Education, Cnr Swanston & Grevatt Sts, Carlton, Vic. 3053 M
UNDERWOOD, Dr R., C/- Hydro Electric Commission, Hobart, Tas. 7000 M
UREN, N.F., WA Institute of Technology, Hayman Rd, Berkeley South, WA 6102 M
URQUIHART, D.F., 6 Grovillia Ave, Heathcote, NSW 2233 M
VALE, K.R., Bureau of Mineral Resources, Canvans, ACT 2601 M
VALE, K.R., Bureau of Mineral Resources, Canvans, ACT 2601 M
VANN J.J., 7 Garden Rd, Burwood, Vic. 3125 S
VANN, P.J., C/- Mr & Mrs A. Van Kann, Unit 11a Continental Crt, 25 Victoria Ave, Claremont, WA 6010 G
VAN HEEREN, W.J., Dept of App. Physics, RMIT, 124 La Trobe St, Melbourne, Vic. 3000 M
VAN KEISSEN, Physics Dept, WA Institute of Technology, Hayman Rd, Bentley, WA 6102 G
VARGA, I.K., 22 Bradley Rd, Windsor Gardens, SA 5067 G
VASEY, R.J., 25 Darcy St, Cardiff, NSW 2285 G
VAUGHAN, A.E., Astrophysics Dept, School of Physics, University of Sydney, NSW 2006 G
VEECH, G., 24 The Grove, Lower Mitcham, SA 5062 G
VELLA, Dr G.J., School of Physics, University of NSW, PO Box 1, Kensington, NSW 2033 M
VENETEANS, G.C., 54 Burnett St, Redfern, NSW 2016 M
VENNING, J.R., 23 Spruance Rd, Elizabeth East, SA 5112 G
VICKERT, Dr R.A., Physics Dept, University of Adelaide, Adelaide, SA 5001 M
VINNES, H.C., 7 Wymbah St, St James, WA 6102 St
VOLLFRECHT, R., 16 The Grove, Wembley, WA 6014 M
VORLICK, G.C., Dept of Theoretical Physics, University of Sydney, NSW 2006 G
WAGNER, D.J., Dept of Physics, WA Institute of Technology, Hayman Rd, Bentley 5th, WA 6102 S
WATT, J.S., AAECH, Private Mail Bag, Sutherland, NSW 2232 G
WATT, T.R., Defence Standards Labs, PO Box 50, Ascot Vale, Vic. 3032 St
WATTI, M.J., 410 Parry Ave, Beverly Hills, NSW 2209 G
WATSON, T., 14 Molyan Ave, Carlingford, NSW 2138 G
WAUS, Dr A., CERRO, Division of Chemical Physics, PO Box 160, Clayton, Vic. 3168 F
WELTON, Dr, 12/115 Knox St, Watson, ACT 2602 C
WHERE, Professor J.A., 20 Moore Lane, Reno, Nevada, 89502, USA M
WICKER, A.D., School of Maths & Physics, Macquarie University, North Ryde, NSW 2113 G
WICKER, B.D., Physics Dept, University of Adelaide, Adelaide, SA 5001 G
WICKER, J., NRE, Lab. 6, 80, WRE, GPO Box 2151, Adelaide, SA 5001 G
WICKER, Dr J.C., Physics Dept, Macquarie University, North Ryde, NSW 2112 F
WICKER, Professor J.P., James Cook University of Nh Qld, Townsville, Qld 4810 F
WICKER, P.A., 13 Cassia St, Greenwood, WA 6024 St
WICKER, R.A., "Raleigh", Oakwood via Inverell, NSW 2360 G
WICKER, A.L., Aust. Dental Standards Lab., 18 Londsdale St, Melbourne, Vic. 3000 M
WICKER, R.C., 15 Federal Rd, Ringwood East, Vic. 3135 St
WICKER, T.H.J., C/- AAECH, Private Mail Bag, Sutherland, NSW 2232 G
WICKER, D.M., CE Group, 180 Labs, HRE, Salisbury, SA 5108 G
WICKER, Dr M.D., Dept of Physics, University of Tas., Box 252C, GPO, Hobart, Tas. 7001 M
WATKINS, B.J., Geophysical Institute, University of Alaska, College, Alaska 99701, USA M
WATSON, Dr R.B., Central Studies Establishment, PO Box 35, Lyneham, ACT 2602 M
WATSON, Dr R.D., Dept of Physics, University of Tas., GPO Box 252C, Hobart, Tas. 7001 M
WATSON-MUNRO, Professor C.H., School of Physics, University of Sydney, NSW 2006 F
WATT, J.S., AAECH, Private Mail Bag, Sutherland, NSW 2232 F
WATT, T.R., Defence Standards Labs, PO Box 50, Ascot Vale, Vic. 3032 St
WATTSON, R.L., 14 Francisco St, Bentleigh, Vic. 3165 St
WATTS, D.L., 6/653 Park St, Brunswick, Vic. 3056 G
WEBBER, B.J., Salisbury College of Advanced Education, Smith Rd, Salisbury East, SA 5109 G
WEBB, Dr J.P., Dept of Geology, University of Qld, St Lucia, Qld 4067 M
WICKER, Emeritus Professor H.C., 12 Tarcoola St, St Lucia, Qld 4067 HF

134 The Australian Physicist, July 1974
### CURRENT ADDRESS UNKNOWN

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANDERSON, R.A.</td>
<td></td>
</tr>
<tr>
<td>BROOMHALL, Dr G.J.</td>
<td></td>
</tr>
<tr>
<td>BROWN, W.M.</td>
<td></td>
</tr>
<tr>
<td>DAVY, A.M.</td>
<td></td>
</tr>
<tr>
<td>D'HELIN, J.</td>
<td></td>
</tr>
<tr>
<td>DE VALLE, R.</td>
<td></td>
</tr>
<tr>
<td>FLAVELLE, A.J.</td>
<td></td>
</tr>
<tr>
<td>FOWLER, D.K.</td>
<td></td>
</tr>
<tr>
<td>FRENCH, D.W.</td>
<td></td>
</tr>
<tr>
<td>GAVREY, J.J.</td>
<td></td>
</tr>
<tr>
<td>HAMILTON, R.J.</td>
<td></td>
</tr>
<tr>
<td>HEARN, D.R.</td>
<td></td>
</tr>
<tr>
<td>HOEKENBERG, Dr H.R.</td>
<td></td>
</tr>
<tr>
<td>HOOGERAAD, R.M.</td>
<td></td>
</tr>
<tr>
<td>KERRY, R.T.</td>
<td></td>
</tr>
<tr>
<td>LE MARNE, A.E.</td>
<td></td>
</tr>
<tr>
<td>LUCYER, S.G.</td>
<td></td>
</tr>
<tr>
<td>MARSHALL, A.D.</td>
<td></td>
</tr>
<tr>
<td>MCGARRY, L.I.</td>
<td></td>
</tr>
<tr>
<td>MOLE, T.A.</td>
<td></td>
</tr>
<tr>
<td>MORGAN, J.D.</td>
<td></td>
</tr>
<tr>
<td>PACLONI, Dr F.J.</td>
<td>(O/S)</td>
</tr>
<tr>
<td>PARKINSON, Dr W.D.</td>
<td></td>
</tr>
<tr>
<td>PINKIVEC, Z</td>
<td></td>
</tr>
<tr>
<td>POTTER, I.C.</td>
<td></td>
</tr>
<tr>
<td>PUTRINO, P.J.</td>
<td></td>
</tr>
<tr>
<td>RILEY, Dr G.H.</td>
<td></td>
</tr>
<tr>
<td>SAVAGE, L.</td>
<td></td>
</tr>
<tr>
<td>SCERRI, A.J.</td>
<td></td>
</tr>
<tr>
<td>SEVERIN, D.F. (ANTARCTICA)</td>
<td></td>
</tr>
<tr>
<td>SHEPPHERD, I.P.</td>
<td></td>
</tr>
<tr>
<td>SHOOTS, W.G.</td>
<td></td>
</tr>
<tr>
<td>SHUTER, B.J.</td>
<td></td>
</tr>
<tr>
<td>SILVESTER, M.L.</td>
<td></td>
</tr>
<tr>
<td>SIM, L.R.</td>
<td></td>
</tr>
<tr>
<td>STEVENS, B.G. (O/S)</td>
<td></td>
</tr>
<tr>
<td>TAYLOR, Dr P.O.</td>
<td></td>
</tr>
<tr>
<td>WALL, Rev. Fr P.W.</td>
<td></td>
</tr>
<tr>
<td>WARREN, R.G.</td>
<td></td>
</tr>
<tr>
<td>WELLS, Dr P.</td>
<td></td>
</tr>
<tr>
<td>WHITING, J.F.</td>
<td></td>
</tr>
<tr>
<td>WILSON, D.J.</td>
<td></td>
</tr>
<tr>
<td>WILSON, N.M.</td>
<td></td>
</tr>
<tr>
<td>WOOD, Dr P.W. (O/S)</td>
<td></td>
</tr>
</tbody>
</table>

### COMPANY SUBSCRIBERS

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI Technical Centre (Dr B. S. Hickman)</td>
<td>PO Box 1, Waterloo, NSW 2017</td>
</tr>
<tr>
<td>ANAC (Australia) Pty Ltd (Mr J.J. O'Neill)</td>
<td>432 Princess Highway, Blakehurst, NSW 2221</td>
</tr>
<tr>
<td>APH Ltd (Mr W. H. Algar)</td>
<td>GPO Box 1643, Melbourne, Vic. 3001</td>
</tr>
<tr>
<td>The Broken Hill Associated Smelters Pty Ltd (Mr D. R. Blasket)</td>
<td>PO Box 219, Port Pirie, SA 5540</td>
</tr>
<tr>
<td>The Broken Hill Pty Co., Ltd (Dr R. G. Ward)</td>
<td>Eessington Lewis House, 500 Bourke St., Melbourne, Vic. 3000</td>
</tr>
<tr>
<td>BH South Limited (The Secretary)</td>
<td>PO Box 194C, Melbourne, Vic. 3001</td>
</tr>
<tr>
<td>The Commonwealth Industrial Gases Ltd (Librarian)</td>
<td>138 Bourke Rd, Alexandria, NSW 2015</td>
</tr>
<tr>
<td>Department of Education NSW, (Mr C. Hadley)</td>
<td>GPO Box 33, Sydney, NSW 2001</td>
</tr>
<tr>
<td>Department of Immigration (R. E. Armstrong Esq.,OBE)</td>
<td>Canberra, Act 2600</td>
</tr>
<tr>
<td>Department of Labour, GPO Box 2817AA, Melbourne,</td>
<td>Vic. 3001</td>
</tr>
<tr>
<td>Dynavac High Vacuum Pty Ltd (Mr R. N. Garde)</td>
<td>PO Box 113, Burwood, Vic. 3125</td>
</tr>
<tr>
<td>EAI—ELECTRONIC ASSOCIATES PTY. LTD (Mr P. T.</td>
<td>Greenhalgh, 225 Park Street, South Melbourne, Vic. 3205</td>
</tr>
<tr>
<td>ELLIOTT AUTOMATION PTY LTD, (Mr A. Aspinall)</td>
<td>GPO Box 110, Crowns Nest, NSW 2065</td>
</tr>
<tr>
<td>ESPEAK (A/Asia) Pty Ltd (Mr K.E. Allen)</td>
<td>PO Box 190, Coburg, Vic. 3058</td>
</tr>
<tr>
<td>LEEDS &amp; NORTHROP Aust. Pty Ltd (Mr P. B. Gibb)</td>
<td>296—298 Botany Rd, Alexandria, NSW 2015</td>
</tr>
<tr>
<td>MIM HOLDINGS LIMITED (Mr C. D. Williams)</td>
<td>PO Box 1413, Brisbane, Qld 4001</td>
</tr>
<tr>
<td>NIC INSTRUMENT COMPANY, (Mr E. Bottomley), Mathews Ave, Airport West, Vic. 3042</td>
<td></td>
</tr>
<tr>
<td>OXFORD INSTRUMENTS AUST. PTY LTD, (Mr J. C. R.</td>
<td>Kubale), 138 Bourke Rd, Alexandria, NSW 2015</td>
</tr>
<tr>
<td>PHILIPS INDUSTRIES HOLDINGS LTD (Dr G. daVee)</td>
<td>Gipsyp, 95 York Street, Sydney, NSW 2000</td>
</tr>
<tr>
<td>SOLA INTERNATIONAL PTY LTD (Mr R. W. Ever)</td>
<td>Sherriff Road, Lonsdale, SA 5160</td>
</tr>
<tr>
<td>VARIAN PTY LTD (Mr W. T. Judson)</td>
<td>83 Oxley St, CROWS NEST, NSW 2065</td>
</tr>
<tr>
<td>VARIAN TECHTRON PTY LTD (Mr G. S. Prew)</td>
<td>Springvale Road, Springvale North, Vic. 3170</td>
</tr>
</tbody>
</table>

136 The Australian Physicist, July 1974
Council resolved as follows -

"That research is an essential part of tertiary education in physics. It enables the teacher to stay abreast of his field and shows the student that science is a continuing and developing process. Any Institution offering degree level courses in physics should allot a proportion of its resources to research".

Overseas professional qualifications continued to be assessed by Dr J. F. G. Darby and Professor J. H. Smith. So far this year there had been ten assessments.

"THE AUSTRALIAN PHYSICIST"

The Editor reported that a number of new Associate Editors had been appointed and it was hoped they would bring new interest and ideas. Ideas and constructive comment were always welcomed from AIP members, and it was felt that the journal could be used much more as a forum to discuss physics and related issues.

The financial position was extremely healthy and the anticipated rise in printing costs should be able to be covered in the budgeted allocation.

Members involved in organizing scientific meetings were urged to supply information, even preliminary information, as early as possible to the Editor for the AIP Calendar so that the calendar could be of maximum use to members.

CONFERENCES AND SUMMER SCHOOLS

The 1974 Pawsey Memorial Lecture will be organised by the Queensland Branch late this year. The lecturer will be Professor B. Y. Mills from Sydney. Further details to be announced.

A very successful Summer School was held at the University of Western Australia on 21-25 January 1974. It was given the name Terrabrook and was devoted to geoaquarion. It was designed as an integrated review of exploration techniques, excluding stratigraphy, ranging through geochimistry, geophysics and surveying. Forty people enrolled for the school.

A Summer School will be held in Tasmania on 27-31 January 1975, immediately following the ANZAS meeting in Canberra. There will be two themes for the School -

(i) Optical Data Processing in Astronomy, and
(ii) High Energy Astrophysics.

Speakers will include Dr Trevor Cole (CSIRO), Professor C. R. A. McClusker (Sydney) and Dr I. Gleson (Monash).

An International Commission for Optics Conference will be held in Sydney on 19-21 August. The AIP Special Lecturers will be Professors Francon and Marechal.

Professor A. B. Fippard will visit each State of Australia during the period 10-24 August.

GROUPS

The Biophysics Group, in conjunction with the Australian Regional Group Hospital Physicians' Association, had organized the 14th Annual Conference of Physics in Medicine and Biology in Sydney on 20-24 May 1974. Some sessions were conjunct with the AIP and Society of Nuclear Medicine. Membership of the Group was 62. The Group continued to co-sponsor the quarterly Australasian Bulletin of Medical Physics and Biophysics.

The Education Group was currently conducting a survey of tertiary physics courses, and it was hoped that a report could be published in August. It was planned to have meetings in Sydney on performance of first year students' audiovisual techniques and, perhaps, on the use of calculators in schools. The Committee was looking into current needs for in-service courses for teachers, the funding of Teachers' Colleges, Physics in Technical Colleges, and the development of laboratory equipment suited to modern courses in schools. Membership of the Group was 69.

Membership of the Nuclear & Particle Physics Group was now 71 and there were 23 New Zealand members of The IOP awaiting membership consequent upon the amendment of the Articles to permit members of cognate societies to join groups. A Vacation School will be held at Goolwa in South Australia on 17-20 February 1975. Lecture notes from the 1973 Melbourne Vacation School were still in preparation. The Group Newsletter was proving very successful.

The Vacuum Physics Group held the 4th Australian Vacuum Conference in Canberra on 11-13 February 1974. 58 people enrolled for the conference sessions, and an extensive course in basic vacuum technology was presented and attracted an enrolment of 78. A very successful exhibition of vacuum equipment was also held. The next conference planned for Melbourne in 1976.

OTHER SCIENTIFIC ORGANIZATIONS

There had been some progress towards the establishment of a new Science Council as proposed by the Hon. W. L. Morrison MP, Minister of Science, but the composition of the Council had not yet been announced. Members of the AIP may be interested in a Discussion Paper "Towards an Australian Science Council" prepared by the Hon. W. L. Morrison and available from the Australian Government Publishing Service.

Council considered a proposal submitted to members of the Conference of Allied Societies by Dr W. I. Whitton (RACI) and Dr K. T. H. Parrr (RACI) concerning the formation of an Academy of Applied Science, Engineering and Technology. Council resolved not to support the proposal at this time.

The Institute of Physics, Singapore, had accepted the AIP offer of reciprocal arrangements whereby a member of one Society visiting the other's country could be helped in establishing contacts with other physicists there, and could enjoy most of the benefits of membership of the other Society (without subscription and with no voting rights) on a short-term basis.

Similar reciprocal arrangements existed between the AIP and The Institute of Physics (UK), the American Institute of Physics, the Canadian Association of Physicists, the European Physical Society, the South African Institute of Physics and the Physical Society of Japan.

25TH COUNCIL MEETING

The next Council Meeting was scheduled for 31 October - 1 November 1974 in Melbourne.

The Australian Physicist, July 1974 137
AMENDMENTS TO BY-LAWS

Notice is hereby given to all members that at the 24th Council Meeting the following amendments were made to the By-Laws -

4. (Deleted)

Replace as follows:

6. Members: A candidate applying for election or transfer to the grade of Member shall be proposed by one Fellow or Member who knows the candidate personally and supported by one or more Fellows or Members who also know the candidate personally.

Replace as follows:

7. Graduates: A candidate applying for election or transfer to the grade of Graduate shall be proposed by a Fellow or Member who knows the candidate personally.

Replace as follows:

9. (1) An application for election or transfer to the grades of Fellow, Member or Graduate shall be in accordance with a form or forms prescribed by the Membership Committee in which, over the applicant's signature, his name, date of birth, postal address, qualifications and professional record shall be clearly stated.

Replace as follows:

10. (1) Applications for election or transfer to the grades of Fellow, Member and Graduate shall be considered in the first place by the Membership Committee.

Replace as follows:

15. (1) The authorised titles of persons belonging to the various grades shall be: Honorary Fellow of the Australian Institute of Physics; Fellow of the Australian Institute of Physics; Member of the Australian Institute of Physics; Graduate of the Australian Institute of Physics.

(2) The authorised abbreviations indicating the professional grades to which members belong shall be as follows: Hon. FAIP; for a Fellow, "FAIP"; for a Member, "MAIP"; for a Graduate, "GAIP".

Add new By-Law:

Associates

16A (1) For admission as an Associate a candidate shall satisfy the Council or the Membership Committee acting on behalf of the Council that he has

(a) qualifications satisfying clause 9(a) of the articles, but insufficient experience in physics for admission to the grade of Graduate; or

(b) tertiary qualifications in a discipline other than physics, and be likely to profit from participation in the Institute's activities; or

(c) a sufficiently high standard of experience in physics without an academic qualification satisfying clause 9(a) of the articles.

(2) An application for admission as an Associate shall be proposed by a member of the Institute or such other person as shall satisfy the Membership Committee. The proposer should know the candidate personally.

(3) The application shall be in accordance with a form prescribed by the Membership Committee in which, over the applicant's signature, his name, date of birth, postal address and qualifications and/or technical experience shall be clearly stated.

(4) The provisions of By-Laws 19 and 19A shall apply, mutatis mutandis, to the consideration of applications for admission as Associates.

Insert heading above By-Law 23A:

Company Subscribers

Add new By-Law:

Group Affiliates

23B (1) A member of a cognate society wishing to become a Group Affiliate shall be proposed by a member of the Institute or such other person as shall satisfy the Membership Committee.

(2) The application shall be in accordance with a form prescribed by the Membership Committee in which, over the applicant's signature, his name, date of birth, postal address and membership of a cognate society shall be clearly stated.

Replace heading above By-Law 24:

Rights of Associates, Students, Subscribers,
Company Subscribers and Group Affiliates

Replace as follows:

24 (1) (a) Associates, Students and Subscribers shall be entitled to take part in the activities of the Institute, its Branches and Groups as if they were members, but shall not be entitled to take part in business meetings of the Institute or of its Branches nor to vote in the election of officers of the Council or Branch Committees.

(b) Group Affiliates shall be entitled to take part in the activities of that Group as if they were members but shall not be entitled to take part in business meetings of the Institute or of its branches nor to vote in the election of officers of the Council or Branch Committees.

(2) Associates and Subscribers who are members of a Group and Group Affiliates may hold office on the committee of the Group, may vote in the election of the Group Committee and may take part in and vote at Group business meetings.

Entrance and Transfer Fees

28 (Deleted)

Replace as follows:

29 (1) Annual subscriptions shall be as set out hereunder -

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fellowship</td>
<td>$31.50</td>
</tr>
<tr>
<td>Membership</td>
<td>$21.00</td>
</tr>
<tr>
<td>Graduate</td>
<td>$13.65</td>
</tr>
<tr>
<td>Associate</td>
<td>$ 6.30</td>
</tr>
<tr>
<td>Student</td>
<td>$ 3.15</td>
</tr>
<tr>
<td>Subscriber</td>
<td>$ 6.30</td>
</tr>
</tbody>
</table>

In addition there shall be a Group annual subscription of $2.10 for each Group to which a member, Associate, Subscriber or Group Affiliate belongs.
Save as hereinafter provided there shall be
due from each member, Associate, Student or
Subscriber upon his election the entrance
fee or transfer fee and the first annual sub-
scription appropriate to the class to which he
is elected but a member, Associate, Student or
Subscriber elected or transferred after the
30th June in any year shall be liable for only
half the annual subscription and if elected or
transferred after the 30th September in any
year may, if he choose, be exempt from payment
of a further annual subscription until the
second January after his election, but if he
so choose to be exempt he shall not be en-
titled to receive any copy of publications
before the first day of January immediately
following his election, and to which he would
otherwise be entitled as a member, Associate,
Student or Subscriber. A Group Affiliate
shall only be entitled to receive the publica-
tions of the Group to which he belongs.

(3) Subject to the provision of the preceding sub-
clause subscriptions for any year shall be due on
the 1st January in that year.

(4) The unit subscription for a Company Subscriber
shall be $50 and each Company Subscriber may
apply for any number of unit subscriptions.

Replace as follows:

30 Any member who has
   (a) attained the age of sixty years and
   (b) been a member for ten or more years may on
       application to the Council and if the Council
       thinks fit have his annual subscription
       waived.

Fees and Subscriptions for Members, Students and
Subscribers of The Institute of Physics and the
Physical Society

31 (Deleted)

Replace as follows:

34 Associates, Students, Subscribers and Company
Nominees may be attached to Branches by the
Council and the provisions of the preceding By-
Law for membership of Branches shall apply,
mutatis mutandis, to such attachment.

Replace as follows:

64 (1) The membership of a Group shall comprise those
members, Associates, Subscribers and Group
Affiliates who have a common interest in the
advancement and dissemination of knowledge of
some branch of physics and who signify
their desire in writing to take part in the
Group's activities.

(2) Membership of one or more Groups shall be open
to each member, Associate, Subscriber and
Group Affiliate on payment of the Group annual
subscription.

(3) Membership of a Group shall automatically
cease if the member, Associate or Subscriber
ceases to be a member, Associate or Sub-
scriber, or the Group Affiliate ceases to be
a member of a cognate society, or if the
Group annual subscription remains unpaid for
six months after becoming payable.

Replace as follows:

72 (1) The mode of election of the officers and other
members of the Committee and their length of
service shall be similar to that laid down in
those By-Laws for Branch elections, mutatis
mutandis, except insofar as Associates, Sub-
scribers and Group Affiliates who are members of
the Group shall also be eligible to vote.

Replace as follows:

75 (1) The procedure for Group meetings shall be as
laid down in these By-Laws for Branches,
mutatis mutandis, except that all Group mem-
bers, whether members, Subscribers or Group
Affiliates, shall have the same rights at
meetings of their Group.

Replace as follows:

76 (3) Each voter shall enclose the voting paper in
a sealed envelope which together with a
separate signed scrutiny slip shall be en-
closed in a second sealed envelope and re-
turned to the Returning Officer or his
appointee. A reply-paid card which can be
sealed shall be acceptable provided the
scrutiny slip can be detached in accordance
with these provisions.

K. H. CLARKE
Hon. Secretary

ELECTION OF THE EXECUTIVE OF THE INSTITUTE

Under Article 44, the present Executive will
cease to hold office at the conclusion of the 12th
Annual General Meeting, which under Article 26
must be held in 1975 and within fifteen months of 21 May
1974, the date of the 11th Annual General Meeting.

Under Article 52 the Council is required to make
nominations for the Executive positions and to
notify members of its nominees.

Notice is hereby given that the following are the
Council's nominees for the Executive to be elected
to hold office from the conclusion of the 12th
Annual General Meeting:

President: Dr J. G. Campbell
Vice-President: Dr T. M. Sabine
Hon. Treasurer: Dr J. K. Mackenzie
Hon. Registrar: Dr J. L. Rouse
Hon. Secretary: Dr J. R. Pilbrow

K. H. CLARKE
Honorary Secretary

ADDITIONAL NOMINATIONS

Members are notified that any additional nomina-
tions which they may wish to make for any of the
offices on the Executive must be delivered to the
office of the Institute at Clunies Ross House, 191
Royal Parade, Parkville, Victoria 3052, by 21 August
next. Nominations must be made in writing, be
supported by three members, and be accompanied by
the written consent of the nominee to accept office
if elected.

The Articles of Association of the Institute pro-
vide that:

(i) no member may nominate more than one can-
didate in any year for any one position;

(ii) no person shall accept nomination for more
than one office on the Executive at any
election;

(iii) no person who has held the office of
President or Vice-President for a full
term of office shall be eligible for elec-
tion to the same office for the next suc-
ceeding term.

B. M. SPICER
Returning Officer

The Australian Physicist, July 1974 139
INSTITUTE AFFAIRS
COMPANY SUBSCRIBERS

AUSTRALIAN INSTITUTE OF PHYSICS

Company Subscribers as at 1 June 1974

ACI Technical Centre
ANAC (Australia) Pty Ltd
APM Limited
Broken Hill Associated Smelters Pty Ltd
Broken Hill Proprietary Company Ltd
BH South Ltd
CIG Ltd
Department of Education, NSW
Department of Immigration, Canberra
Department of Labour
Dynavac High Vacuum Pty Ltd
EAI — Electronic Associates Pty Ltd
GEC — Elliott Automation Pty Ltd
Kodak (A’asia) Pty Ltd
Leeds & Northrup Aust. Pty Ltd
MIM Holdings Ltd
NIC Instrument Co.
Oxford Instruments Aust. Pty Ltd.
Philips Industries Holdings Ltd
H.B. Selby & Co. Pty Ltd
SOLA International Pty Ltd
Varian Pty Ltd
Varian Techtron Pty Ltd

Reports of Activities

Mechanics, thermodynamics, optics and electromagnetism are the basic topics of physics most commonly encountered by physicists working in the pulp and paper industry. The reasons for this emphasis on classic al physics are easily understood. Paper and paperboard must meet certain mechanical and optical specifications such as tensile strength, tear strength, dimensional stability, colour and opacity. These properties are designed to predict either the performance of the end product, e.g. the ability of a paper bag to hold its contents without bursting, or the performance of the paper in the converting operation, e.g. the ability of board to fold without cracking. In the manufacturing processes problems in mechanics and thermodynamics arise, e.g. sub-division of the wood into chips, hydrodynamics of the fibre suspensions from which paper is formed and drying of the formed sheet.

Within Australian Paper Manufacturers Research Division topics with a physics content which have been studied or are in the process of being studied include: the effect of raw material and process variables on strength properties of paper, paperboard and converted products, surface properties of coated paperboards such as roughness and gluability, hydrodynamics, materials balance and drainage studies of the ‘wet end’ of a paper machine, friction between paper machine forming wires and suction box covers, problems encountered in cutting paperboard, behaviour of paperboard when it is folded, mechanical properties of single fibres, theoretical studies of paper structure, theoretical studies of corrugated board, and the corrugating process, noise control and the design of continuous measuring equipment of various types.

Some of the techniques used are: sonic measurement of elastic modulus, Moiré fringe measurement of strain patterns, resonant vibration measurement of stiffness, torsional measurement of shear modulus, optical measurement of fibre distribution and surface roughness, radioactive tracer techniques, hydrodynamic modelling.

In studying any one topic knowledge is often drawn from various areas of physics. The following method developed for measuring the mass distribution within a sheet of paper is a typical example. First the absorption of beta rays by wood fibres was used to obtain a beta radiograph of the mass distribution. An optical device was constructed to scan the radiograph. Using equations for beta-ray absorption by paper and for light absorption by the radiograph the paper mass was related to the light intensity transmitted through the radiograph. An electronic circuit was designed to convert the photodiode output to a voltage proportional to sheet mass, and the signal was finally passed to a frequency analyser to obtain the scale and magnitude of the variations in mass.

Physics in the Photographic Industry

Kodak activity in Australia can briefly be summarised as the manufacture and processing of materials and equipment for photography. To enable this to be done efficiently, specialised areas of manufacturing technology are studied as well as all applications of photography. Most of these fields are related to some branch of physics.

The efficient manufacture of photographic materials requires the control of such physical parameters as temperature, humidity and electrostatic charge. Product composition is monitored by physical as well as chemical techniques e.g. X-ray fluorescence. Quality control utilises optical and other instrumentation.

The marketing division of the company has to be competent to offer sound technical advice to all users of photographic materials. Pictorial photography involves physics, particularly geometrical and physical optics in camera and printer design, colorimetry and image structure (the general name for granularity, sharpness, resolving power etc.) Methods of evaluating the final image, whether it be a snapshot of a baby or a photograph on the moon, and in black and white or colour, are dependent on sophisticated optics and psycho-physics.

Radiography is a direct application of the properties of X-rays to the design of X-ray films. This involves a
deep study of the interaction of X-and gamma-rays with matter as well as image structure of photographic emulsions.

The recording of sound on film, either photographically or magnetically, involves acoustics and electronics. In modern electronics, photographic processes are used for the production of printed circuits. Chemical milling involves photo sensitive resists. Holography is a new field involving a knowledge of coherent optics.

These examples show the importance of physics to the photographic industry. Kodak acquires and uses the physics expertise by the employment of professionally qualified physicists in all divisions of the Company (manufacturing, marketing, processing and research).

In the research laboratory, they work as individuals or members of a multi-disciplinary team on problems relevant to the plant activity. This work may be phenomenological or applied in nature.

As a result of the detailed expertise gained by such scientists, many eventually transfer to demanding and responsible positions elsewhere in the Company.

Physics in Instrument Development

ANAC (AUSTRALIA) is a wholly owned subsidiary of the AUCKLAND NUCLEAR ACCESSORY COMPANY, of New Zealand. ANAC (NZ) was founded in 1966 for the prime purpose of manufacturing polarized ion source systems and components. Since that time, several world famous laboratories have purchased ANAC ion sources.

The polarized ion source gave rise to the design and development of ANAC magnets, for beam handling as well as for analysing and laboratory use. Over 30 Ion Beam Handling units have been sold to Australian, US and European Laboratories.

Other ANAC products include a Tiltmeter and Precision Transducers, with a resolution of $10^{-9}$ radians ($10^{-4}$ cm). ANAC based the transducer on a design arrived at over a period of several years by Professor F.D. Stacey, Department of Geophysics at Queensland University. Special transducers for geophysical strain studies and investigation of rock hysteresis have been developed.

A Multistylus Chart Recorder (Model 910) has been developed from an original concept at the Naval Research Laboratory, Auckland. It was particularly intended for sonar display. The record is produced on electro-sensitive paper, via a 128 channel Analogue-to-Grey Scale converter (Model 951). The Model 951 extends the applications range considerably to uses in industry, medicine, geophysics and biology.

ANAC (AUSTRALIA) is a sales office, and in addition to the products of ANAC (NZ) represents a limited number of overseas companies. The products of these companies are almost all related to the nuclear field. They include: ORTEC (USA) for NIM Modules, X-Ray analysis and Life Science equipment, radiation detectors of many types; EG&G (USA) High Energy Physics and CAMAC instrumentation; GENERAL IONEX (USA) now producing a full range of ion sources, ion beam sputtering devices, ion optics and scattering chambers; SPELLMAN (USA) High and Very High voltage supplies in rack-mounting, free standing and modular configurations; BICRON (USA) Sodium Iodide Crystals, Compton Suppression Systems and X-Ray detector crystals and probes; BERKELEY NUCLEONICS (USA) Digital Delay Generators, Random Periodic pulse generators and portable NIM bins; RECOGNITION SYSTEMS (USA) Diffraction Pattern Sampling Units, Recording Optical Spectrometers, 64 element detectors for optical recognition.

Scientific Instruments

EAI-ELECTRONIC ASSOCIATES PTY LIMITED are a wholly-owned Australian subsidiary of ELECTRONIC ASSOCIATES INCORPORATED, New Jersey, manufacturers of scientific instruments such as QUADRUPOLE Mass Spectrometers, Residual Gas Analyzers, Plant Process G.C.; Pollution Monitors, etc.; Electronic Analog, Digital and Hybrid Computers. The range includes small teaching models, MINIAC multi-user units and the complete range of EAI PACER digital computer based systems such as Hybrid, Graphics, Laboratory Control, Plant Monitoring, Data Acquisition; Remote Computing, etc. Also included are a range of special simulators, teaching response systems, computer peripherals, industrial CCTV, etc. Agencies include BRUSH high-speed strip chart and X-Y Recorders, Biomedical Systems; GOULD electrostatic printer/plotters; ZETA digital plotters; FACIT paper tape and input/output peripherals.

SHOULD PHYSICS COURSES BE RADICALLY CHANGED?

Many physicists are concerned by an apparent swing against science amongst potential students, which is causing a reduction in enrolments in tertiary physics courses. In an effort to clarify the possible causes of such a swing, the NSW Branch held a meeting on 14th May to consider whether the nature of existing physics courses was at fault. Some 50 members attended to hear the four invited speakers and to take part in discussion. Senator P.E. Rae, the Opposition spokesman on education, was also present and gave a short contribution.

Mr Frank Price, General Manager, Pioneer Concrete Services, opened with his views on the employment of graduates as managers in technological industry. He pinpointed three areas of competence vital to an industrial administrator which were barely acknowledged by most science/engineering courses:— the ability to lead,
cooperate with and motivate people; a knowledge of financial institutions and accountancy; and a familiarity with legal processes. Mr Price pointed out that at present these skills could not be included in a realistic degree syllabus, but suggested that students aiming for an industrial career might specialize in some of them towards the end of their course. He had however been discouraged by personal experience with graduates of some existing business schools.

Dr Guy White, CSIRO Division of Physics, felt that present University physics courses were quite well matched to basic research appointments, but that they required broadening to meet the requirements of more general careers in technology and industry. He quoted from a number of overseas authorities who had pronounced their opinions on the subject. The Hill-Fensham Report (Australia) concluded that present PhD courses were designed to provide the future staff of universities, and there was a need to increase the freedom of choice of subject for participants, and to encourage a greater integration of the sciences. Again, Philip Morse (USA) had asked whether physics has not become ingrown; if so, it must be superseded. Sir Eric Ashby (UK) had quoted, “In a University, the specialist and analyst is king; in society, the non-specialist and synthesiser is king”. Prof. Brian Pippard (UK) has proposed a revolutionary undergraduate curriculum involving two years of general education for all science undergraduates.

The Pippard proposals were also referred to by Professor Peter Mason (Macquarie University), who believed that they were idealistic and unlikely ever to be accepted in Australia. Physics courses, Dr Mason maintained, should not be radically altered in a desperate attempt to make them ‘trendy’. He was deeply worried by the alienation amongst students against physics, because there are jobs in society which, he knew, only physicists could do. He quoted Kurt Waldheim, UN Secretary General, referring to the six outstanding problems facing the world today: Mass Poverty, Population, Food, Energy, Military Expenditure, and World Monetary Policy. Mason believes that the achievements of physics are relevant to these problems (even to economics) and that students do not realize this fact. What is the solution? He outlined some approaches that had not worked (PSSC Physics and other ‘technical-fix’ courses) and then suggested without too much optimism some ideas that might work. He proposed either that students might be given the chance to decide what courses are needed, or that staff and administration together might listen to someone like Frank Price (u.v.) so that real-life situations might be taken into account in designing physics courses. To illustrate the latter approach, he commended the Pelican book, *The New Science of Strong Materials* by J.E. Gordon as having a good mix of real practicalities with physical principles.

Dr Ian Bassett (NSWIT) accepted that there was a shortage of jobs for physicists in the 1970s and blamed their tendency to look at problems too narrowly. For instance, a real problem, such as a research study into bush fires, is by traditional ideas neither physics nor chemistry nor engineering — but clearly all of these disciplines should be involved in it. He proposed that physics courses must be broadened to include some social sciences, and perhaps even English (or Australian) literature. The basic part of the course should emphasise classical, rather than quantum physics. NSWIT was considering some such course, Dr Bassett said. A sandwich course was one approach which was favoured by employers, although there were examples of a reluctance by industry to provide places for trainees. This scheme is operated in NSWIT architecture and engineering courses.

Senator Peter Rae questioned whether broadening the specialist was the right approach, and said he favoured something like Prof. Bradbury’s Technological Economics course (University of Stirling, Scotland). This approach treated the subject as a discipline in its own right and avoided the watered-down flavour implicit in the other suggestions.

Discussion ranged widely from an assertion, on the one hand, that physics was an inadequate substitute for religion, to the acceptance that physicists are often arrogant in their tendency to over-simplify a problem. Students, it was maintained, have swung to the social sciences searching for a touchstone with reality, and are not convinced by the self-evident truth that physics is at the core of any philosophy that seeks to deal with reality. As long as physicists are seen to be members of an arrogant, self-satisfied, empire-building establishment which cares little and does less about the ills of an imperfect world, it is natural that idealistic youth should seek elsewhere for the clear hard light of truth. The days are gone too, when the more hard-headed student looking for a passport to a safe career would be inclined to choose physics. It is surely not altogether a tragedy if physics departments and physicists are now having to take a more searching look at their subject and at their attitudes towards it.

**Further Reading**


*Physics Today, Dec. 1973, p. 73 (survey of US companies and universities).*

*Physics Today, Apr. 1973, p. 23 (Philip Morse).*

*Listener, 16 March 1972, p 325 (Sir Eric Ashby).*


*Physics Bulletin, Nov. 1969 (A.B. Pippard).*

— J.C. Macfarlane.
BOOK REVIEWS

Reviewed by R.G. Hewitt, School of Physics, University of Sydney.

This book covers the fashionable field of particle physics at an appropriate level for third and fourth year students at Australian universities. It strikes a reasonable balance between theory and experiment. The reader would require an elementary understanding of special relativity and quantum mechanics even though some of the necessary results are given in appendices.

Feynman diagrams are introduced at an early stage as a pictorial representation of processes, and used to discuss antiparticles, pions and anomalous magnetic moments. These topics are followed by chapters on the strange particles, leptons, non-conservation of parity, the neutral K meson puzzle and baryon and meson resonances. The last part of the text is mainly concerned with some of the theoretical developments of the last decade, SU(3), quarks, SU(6) and Regge poles and concludes with a discussion of electromagnetic interactions and form factors. There are several useful appendices, including a summary of the Particle Data Group's table of particles and their properties.

The organisation of material in this book should make it popular with students. The chapters are divided into several short sections which tend to accentuate the logical presentation. The sets of references and exercises given at the end of each chapter compensate for the somewhat brief style of the text. I feel this book will provide a stepping stone to the more advanced treatises.

THE FIELD CONCEPT IN CONTEMPORARY SCIENCE, Mendel Sachs, Charles C. Thomas, Publisher, Springfield, Ill., 1973, xi + 120 pp. $9.75.
Reviewed by M.G. Bell, A.N. U. Canberra.

This monograph appears in a series whose extensive list of titles so far ranged from problems in traditional religious and ethical philosophy to science and sociology. The author, a theoretical physicist, presents a non-mathematical account of the historical development of continuous field theories in physics, emphasizing throughout the dichotomy which he believes must necessarily exist between such theories and those based on an atomistic view of matter.

The book begins at the point where Faraday introduced the concept of a field of force in his theory of electromagnetism, a concept which contrasted with the traditional Newtonian view of action at a distance. From here, we are led through the period of the mathematical development of electromagnetic field theory by Maxwell, to a discussion of fields in the two great theories of modern physics, general relativity, which describes the interactions of matter in the continuous field of space-time, and quantum mechanics, in which the behaviour of matter is represented by continuous distributions, or fields, of probability. Finally, the author discusses his belief that a unified elementary field theory may be able fully to describe matter both in the relativistic and quantum mechanical limits, a subject on which he has already written extensively. Throughout, the text is enlivened with biographical sketches and descriptions of the historical background in which the major figures worked.

In his attempt to make the book intelligible to a wide range of readers, the author has simplified the descriptions of physical experiments and their interpretation and has sacrificed some rigour in developing his arguments. While it undoubtedly raises more questions than it answers, this book provides a readable introduction to the subject of field theory and it encourages a critical evaluation of accepted views. It would appeal to all students of physics interested in the history and philosophical basis of their subject.

Reviewed by P.V. Smith, Physics Department, University of New England, Armidale, N.S.W.

"The principle objective of this book is to enable students to grasp the essential techniques of dealing with tensors and group theory as they are applied to crystals".

In fulfillment of this aim the author has provided a very readable and comprehensible text in which the theory finds relevance in many physical applications. Progressive understanding is encouraged by an extensive collection of problems throughout the text, the answers to which are given in full at the end of each chapter.

The first ten chapters, which comprise Part I, are devoted to tensors. After an introduction to crystal symmetry, this part deals with second-order tensors, thermal expansion, stress and strain tensors, piezoelectricity, elastic properties and elastic wave propagation, polar and axial tensors and photoelasticity.

Part II, of nine chapters, develops group theory in relation to crystal point groups and space groups and treats Brillouin zones, molecular vibrations and Raman spectra. Some discussion of infinitesimal rotations and the concept of angular momentum in Quantum Mechanics would well have been included in this section. The overriding aim of the book is clearly to promote an understanding of basics rather than to provide the completeness required in a reference text.

There are seven appendices, a helpful list of symbols, some related references and an adequate index.

In summary, this book with its widespread applications would provide a relatively easy and interesting introduction of the student to the fundamentals of tensors and group theory but would need to be supplemented by other texts for a comprehensive treatment.
A.P.S.A. MEMBERSHIP

A MATTER OF RESPONSIBILITY

* Salary
* Annual Leave
* Long Service Leave
* Fringe Benefits
* Legal Matters
* Industrial Advice

It is the responsibility of the Association of Professional Scientists of Australia to guard the interests of its members in these matters. It is the responsibility of individual physicists to support the only organisation able to represent them in industrial tribunals.

Return this form to: The General Secretary, The Association of Professional Scientists of Australia, 41 A'Becket Street Melbourne. 3000.

Please send the following information:

☐ A.P.S.A. literature
☐ Membership application form

Dr./Mr./Mrs./Miss ___________________________ (Name)

_____________________________ (Address)

If you do not wish to damage the page—please copy this form and post to A.P.S.A.


Reviewed by K.J. Taylor, National Standards Laboratory, Chippendale, N.S.W.

Professor R. Bruce Lindsay is a world authority on the literature relating to the field of acoustics, so it is appropriate that he should personally edit this volume in the series of Benchmark Papers in Acoustics, of which he is also Series Editor.

The first chapter of the book is a reprinting of a paper published by Lindsay in 1966 and provides a comprehensive review of the history of acoustics from the earliest records to the present time, and particularly emphasises the contribution of Lord Rayleigh. The following thirty-eight chapters comprise selections from papers which were important in the development of the science of acoustics to the end of the nineteenth century and range chronologically from the works of Aristotle through Galilei, Newton, Helmholdt, Lord Rayleigh and others to Sabine. Fourteen of these articles are here translated into English for the first time while others are presented as photo-copies of the original English publications. The Editor gives interesting biographical introductions to each of the authors and has made astute scientific comments where they are called for.

This book will not be regarded as an important source of scientific information but for those who are interested in the historical and philosophical development of science it will provide a most enjoyable resource. It unearths and brings within our reach interesting papers which, for most of us, would otherwise remain obscure.

THE CALENDAR

August
19-21 Optical Information Processing, Sydney (ICO-AAS).
19-23 International Union of Crystallographers, Melbourne.

September
24 Applications of Electronics to Geophysics (Mr Drinkow, Inst. Elec. Eng., Sydney)

October
November
11-6 Dec Radio- nuclides in Medicine and Biology, Sydney (ASNT)

February
1975
Crystalllographers' Meeting, Sydney.
EXECUTIVE

Dr F. J. Jacka, President
Dr J. G. Campbell, Vice-President
Mr K. H. Clarke, Hon. Secretary
Dr J. K. Mackenzie, Hon. Treasurer
Dr J. L. Rouse, Hon. Registrar

Assistant Secretary: Mrs Pat Smith

REGISTERED OFFICE

Clunies Ross House,
191 Royal Parade,
Parkville, Victoria 3052.
Telephone: 347-4941.

All correspondence should be addressed to:
PO Box 52, Parkville, Vic. 3052.

SECRETARIES OF BRANCHES AND GROUPS

ACT Branch: Mr C. S. Newton, Dept of Nuclear Physics, ANU, Box 4, Canberra, ACT 2600.

NSW Branch: Mr D. Paix, Physics Department, Prince of Wales Hospital, Randwick, NSW 2031.

Qld Branch: Mr R. E. Dunlop, Physics Department, QIT, George St., Brisbane, Qld 4000.

SA Branch: Mr K. H. Lloyd,
UAR/AD WRE, Salisbury, SA 5108.

Tas. Branch: Dr J. R. Fox, Department of Physics,
University of Tasmania, GPO Box 252C, Hobart, Tasmania 7001.

Vic. Branch: Mr J. V. Sullivan, CSIRO Div. of Chemical Physics, PO Box 160, Clayton, Victoria 3168.

WA Branch: Dr M. Lynch, Department of Physics,
WAIT, Hayman Road, Bentley South, WA 6102.

Biophysics Group: Mr L. D. Oliver, Department of Medical Physics, Prince of Wales Hospital, Randwick, NSW 2031.

Education Group: Dr C. Gauld, School of Education, UNSW, Kensington, NSW 2033.

Nuclear and Particle Physics Group: Dr M. J. Kenny, c/- AAECRE, Sutherland, NSW 2232.

Vacuum Physics Group: Dr R. J. MacDonald, Physics Department, SGS, ANU, Box 4, Canberra, ACT 2600.

UNIVERSITY OF NEW SOUTH WALES

SCHOOL OF PHYSICS

LECTURER

(REF. 34)

High academic qualifications required. Experience in teaching at tertiary level an advantage. Appointment from February, 1975. Further information from Professor E. P. George.

Salary $9,002 range $12,352 per annum. Commencing salary according to qualifications and experience.

For details of appointment and application form write (quoting reference number) to Appointments Office, P.O. Box 1, Kensington, N.S.W. 2033. Applications close 13th September, 1974.
Got a problem?

Tell it to your HP 9821

It's easy to talk it over with your NEW HP 9821 programmable calculator, it understands. Because with the HP 9821 YOU can design a system to meet YOUR specific needs and problems.

Convenience of cassette

The HP 9821 stores information on cassettes. This means GREATER STORAGE CAPACITY FOR PROGRAMS AND DATA. Each 300 ft. cassette has a capacity equivalent to about 8,000 registers. Cassette control . . . either from keyboard or program . . . is provided by a built in ROM (Read Only Memory).

With the basic memory HP 9821 can solve 16 simultaneous linear equations with 16 unknowns. The fully expanded memory enables the calculator to solve 70 simultaneous equations with 70 unknowns.

Easy to use . . . versatile . . . HP 9821 is desktop.

Unique natural algebraic language simplifies programming and operation.

Want to know more?

Please mail coupon to address below for obligation-free additional information, or hands-on demonstration, for HP's 9821.

Please tick appropriate square.

☐ Please send me detailed information

☐ Please make appointment demonstration

Name: ____________________________
Address: ____________________________

Telephone no. ____________________ P/Code

Publication name: __________________

HEWLETT PACKARD

Sales and service from 172 offices in 65 countries.

Australia, 31-51 Joseph Street, Blackburn, 3130, Victoria. Telephone 898351, Other Offices: Adelaide, Brisbane, Canberra, Perth and Sydney. Also Auckland and Wellington, New Zealand.

Wholly set up and printed for the Australian Institute of Physics, Charnies Ross House, 191 Royal Parade, Parkville, Victoria by Simmona Limited, 32 Parramatta Road, Glebe—1974