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in new zealand
Vol 51 No 3 April 1987

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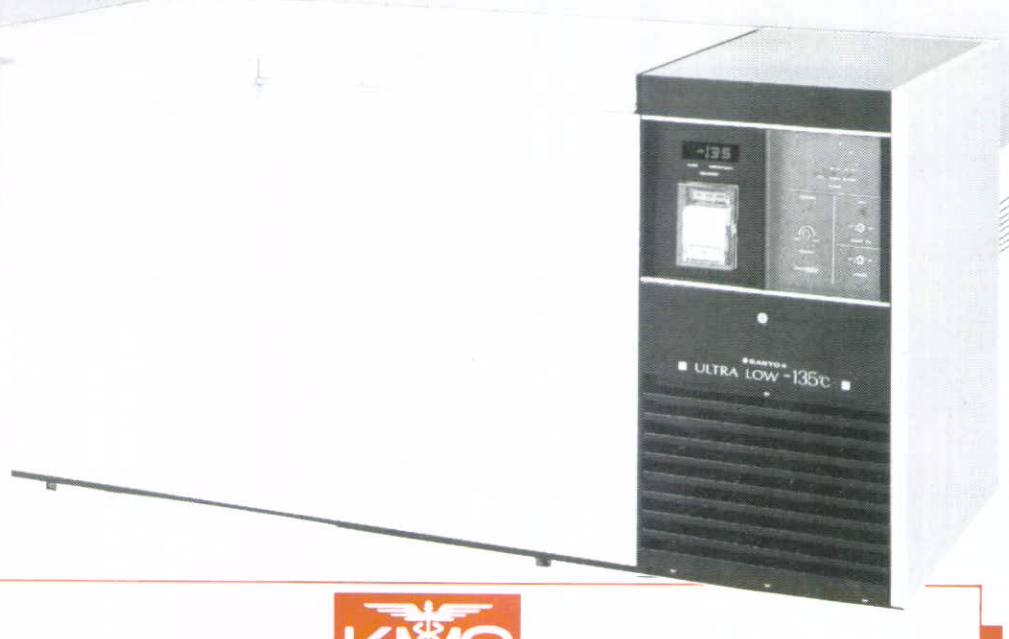

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NZIC chemistry in new zealand

VOLUME 51 NO 3

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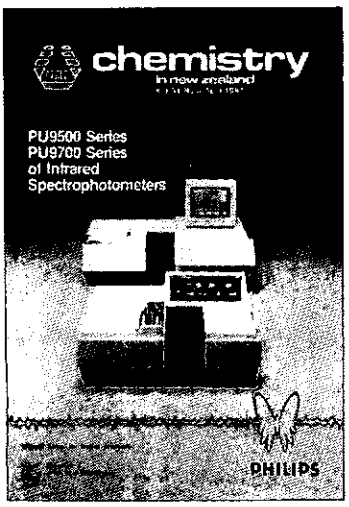
Front Cover Story



Philips' PU9500 and PU9700 Series Infra-Red Spectrophotometers set new standards for low and medium priced IR Spectrophotometers. See P 48.

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Special Advertising Features for 1987

1987 Annual Conference
One of the features of the 1987 NZIC Annual Conference is to be the Chemical Industries Trade Fair (CITF 87). Chemistry in New Zealand will be giving this maximum publicity over the next six months, and invites all advertisers to take full use of this exciting publishing opportunity. The publishing schedule will be as follows:
June issue: CITF 87 preview — notes on all exhibitors
August issue: Special 36 page lift-out supplement containing conference programme, abstracts of plenary papers, and CITF 87 Directory
October issue: CITF 87 review — notes and photos on the exhibition, and equipment presented therein.

Careers Directory
Another feature of the June issue will be a repeat of the Careers Directory which was so successful last year. Prospective employers should contact us now for inclusion in this issue, which will be distributed to all final-year chemistry students in universities and technical institutes. Advertisements for job vacancies will also be particularly welcome.

Other
Other advertising features in forthcoming issues will include chemical safety, consultants, environmental pollution and water treatment, instrumentation, and laboratory supply houses.

For further information on any of the above contact our Advertising Manager, or The Publisher, Chemistry in New Zealand, Ph 775-533 or write P.O. Box 9072, Newmarket, Auckland.

NATIONAL CHEMISTRY WEEK

National Chemistry Week, 15-21 August 1987

Dr R.B. Bucat, RACI/NZIC Visiting Fellow will be visiting branches on the following evenings:
Monday 17 August Christchurch
Tuesday 18 August Dunedin
Wednesday 19 August Wellington
Thursday 20 August Palmerston North
Friday 21 August Hamilton

He will then be travelling on to NZIC Conference in Auckland on Sunday 23 August.

The main focus of his talks will be related to the Australian Academy of Science school chemistry course and its philosophies. Branches will receive from him material about the course and are asked to pass it around to interested groups and individuals.

Dr Bucat will be delighted to meet groups of teachers and others informally and possible topics of concern in areas of chemical education have been suggested to him.

Crystal Growing Competition

Some local branches will be organising a competition among schools in their area. As this is the Institute's first attempt at a competition of this type it is recommended it be kept as simple and inexpensive as possible. Details for a possible set of conditions based upon growing a single, well-shaped crystal of potassium alum have been prepared by Mr A.H. Wooff and sent to branches.

Three national competitions have been organised. They are:

Photographic Competition.

Theme: Chemistry at Work. Entries should show how chemistry has an important part to play in our lives or economy. The competition is open to secondary pupils.

National prizes will be: Colour print, $100 first prize; $50 second prize. Monochrome: $100 first prize; $50 second prize.

Closing date with branches 20 June 1987.

Essay Competition

For all 6th and 7th formers.
Topic: Chemistry — Friend or Foe?
National prizes: First $150; second $50; third $25.
Closing date with branches 30 June 1987.

Poster Competition

For forms I to IV.
Theme: Chemistry at Work.
National Prizes: First $150; second $50; third $25.
Closing date with branches 30th June 1987.

Award winners will be announced and prizes awarded during National Chemistry Week.

Branches are being asked to promote these, and other activities as vigorously as posssible. The success of the first National Chemistry Week will depend, to a large extent, upon the strength and drive of branch organisations.

Terry Hitchings
Vice President

Chemical Analysis/Biochemistry Competition for Secondary Schools (Waikato, King Country and Bay of Plenty Areas)

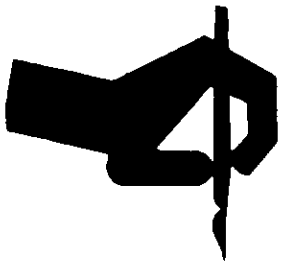
The Waikato branch of the NZIC is again organising chemistry and biochemistry competitions. This year a choice of two experiments is offered.
Option 1, Chemistry: Entrants will be supplied with a solid sample which they will have to analyse quantitatively for carbonate. Brief instructions for a method will be supplied.
Option 2, Biochemistry: Entrants will have to assess the enzyme activity in a fruit or vegetable. We will supply the material for assay and a standard enzyme preparation, together with instructions covering the basic method.

It is suggested that the analysis is carried out by pairs of students, and up to two pairs may enter each option from any one school. A detailed report on the analysis must be submitted to the NZIC for judging.

For each option there will be a $50 first prize and a $25 second prize, to be spent on books or laboratory equipment at the discretion of the supervising teacher. Winners will be announced for the NZIC Chemistry Week in August.

Entries close on Friday 8th May. Samples will be sent to the schools by the start of Term II. Completed reports will be required for judging by Monday 27th July.

For further details and entry forms please write to:
NZIC Analysis Competition, c/- Chemistry Department, University of Waikato, Private Bag, Hamilton.



LETTERS TO THE EDITOR

Grades of Membership

As noted in the February issue of *Chemistry in New Zealand* it is the wish of Council that members will participate in the debate on grades of membership, by contributing to this column. Two letters have already been received and these are reproduced below.

It is my stated intention to publish as many of the letters as possible, of those received. The editorial knife will only be wielded if letters are excessively long — 150 words is the specified maximum — or if an inordinate number are received. In a moment of realism I have also stated that I am not expecting more than half a dozen or so letters on this subject. I would be quite happy to be proven wrong.

Bruce Graham

Sir,

The Waikato Branch used the questionnaire with the same options as Auckland. Responses — 71 out of 165 members: option (a) (status quo) 6, (b) (amalgamation) 60, (c) (other changes) 5. Four members noted they favoured (b) and (c). About half the responses included comments which showed the votes were carefully considered, reflecting often long-held convictions. In earlier debates Waikato members were in favour of admitting NZCS holders and against separate membership grades, so branch opinion has remained consistent.

In discussion, the Branch Committee noted the very substantial blurring of the technician-scientist boundary which has occurred in the last decade. Long-continued staffing pressures have led Government and other employers to appoint BSc's to technician positions. In addition, techniques and methods have become much more sophisticated in the last decade so that there is a new level of demand on technicians.

The branch strongly supports the principle that corporate membership requires full professionalism. The step from non-corporate to corporate member remains the critical one for all applicants. However, most of our members feel that initial training as BSc or NZCS should stop being a dominant indicator and become simply one factor in the careful examination of each case for election to MNZIC.

Rex T Gallagher
Branch Chairman, Ken Mackay
Immediate Past Chairman

Sir,

In his *Comment* in the December issue of *Chemistry in New Zealand* D.J. Hogan speaks of the consequences of putting NZCS and degree holders in the same grade. He writes of retaining credibility, lowering of standards and the danger of 'equating' New Zealand certificates with degrees.

Surely this is elitism as it takes no account of the quality or ability of the individual chemist. It enhances the idea that the academic is of more value than the practitioner.

When initially approached to join the New Zealand Institute of Chemistry about five years ago, I declined because non-corporate grades of membership were decreed by the qualification one held. I relented two years ago and joined because there was a movement within the Auckland branch to amalgamate non-corporate grades.

I believe an amalgamation of the grades in question can only raise standards with the institute by attracting more practicing chemists. This rationalisation can only enhance the credibility of the NZIC.

Alan Johnson
Associate Member

Ron Hicks Memorial Trust Award

This award will be made again in 1987. Applications are invited from authors of articles or papers considered significant in solving or clarifying sewage treatment or water pollution problems in New Zealand.

Awards may take the form of cash, books, equipment, etc as seen appropriate to the Trustees in each case. This year it is expected the award could be worth at least $500.

Applications or submissions for consideration of an award should be addressed to: "Ronald Hicks Memorial Trust", c/- NZWSDA, P.O. Box 4088, Hamilton East, N.Z." to arrive by 19th June 1987.

The application should include a copy of the article or paper together with the name(s) and address(es) of the author(s) and a brief justification of the significance of the contents. Where the submission is by a third party, their name and address should also be provided. Non-members of WSDA are also eligible.

Combined Annual Conference of the New Zealand Institute of Chemistry and the New Zealand Biochemical Society

Auckland, New Zealand, 24-28 August 1987

The theme of the conference is Commercialisation of Chemistry. This theme is directed at the interface between university, state sector and industrial science. The organising committee has made considerable changes of format from previous conferences. This will be noticed in the choice of venues, social events, the trade fair, and a simplified registration procedure with all-inclusive conference costs. Details of the programme are summarised below.

Sunday, 23 August: Mixer and registration.

Monday, 24 August: Conference opening at the Sheraton Hotel. Speakers will address the themes of policy making and policy implementation in the areas of commerce and chemistry. They include **Dr Jim Ellis**, DSIR; **Dr Ashley Wilson**, General Manager, Kinleith Industries, NZ Forest Products; **Dr George Pimentel**, 1986 President of the American Chemical Society; **Dr David Williams**, University of Wales Institute of Science and Technology; and **Professor Richard Batt**, Massey University.

Tuesday, 25-Thursday, 27 August: Over these days the conference will take place at the University of Auckland. There will be plenary and sub-plenary sessions on the themes of Resource Development, The Analyst in Industry, Food Technology, Pharmaceuticals, Biotechnology, and Education and Employment. Key speakers on these days will be **Dr Ronald Ellis**, Merck, Sharpe and Dohme, USA; **Professor Derek Saunders**, Professor of Polymer Physics and Engineering, Cranfield Institute of Technology, UK; **Professor E Gerald Meyer**, University of Wyoming, USA; **Dr Ian Miller**, Managing Director, Carina Chemical Laboratories, Wellington; **Dr Bruce Baguley**, Director, Cancer Research Laboratory, University of Auckland School of Medicine; **Professor Charmian O'Connor**, Chemistry Department, University of Auckland; **Profesor F W Plapp**, Texas A & M University, USA; **Dr W S Hancock**, Genentech, San Francisco, USA; **Dr R B Bucat**, University of Western Australia, and **Mr Terry Hitchings**, Principal, Riccarton High School, Christchurch.

The Easterfield Address, and the Presidential Address will both be presented in conjunction with the AGM on the afternoon of Tuesday 25 August.

Friday, 28 August: Friday is committed to specialist workshops and seminars. These include FTIR, molecular biology, and chromatography. There will also be specialist sessions run concurrently with the sub-plenary sessions, earlier in the week.

Social Functions: Included in the cost of registration will be the Conference Dinner at the Sheraton (one of Auckland's finest hotels), an evening at the Auckland Institute and Museum, and a Trades Dinner.

CITF-87: (Chemical Industries Trade Fair). This will take place concurrently with the conference from Tuesday to Thursday. Access will be open to interested members of the public, Institute members and conference delegates. Conference lunches and teas will be served in this area.

Call For Papers: Delegates are invited to present papers, or for preference posters, on any aspect of chemistry. The committee is hoping to avoid the clashes that occur with large numbers of specialist sessions by using poster sessions, a practice widely used overseas. To encourage this there will be a prize for the best poster presentation. By appropriate scheduling all participants will be able to view and discuss the presentations.

Details, and suggestions for posters and papers will be given with the registration form to be distributed shortly. Abstracts will be published in the conference programme in a similar way to previous years.

Student Paper Competition: The usual student paper competition will be held. Student entrants will be sponsored by the payment of their travel costs.

Accommodation: Accommodation has been reserved in university halls of residence (cost approximately $30/night), Grafton Oaks motel ($100-$120/night) and the Sheraton Hotel (about $180/night).

Any questions about the conference or programme should be addressed to the conference secretary,

Mr Paul Farr,
Quik-Stik International Ltd,
P.O. Box 76-221,
Manukau City.

CONFERENCE GUESTS

Professor David Williams

David Williams is Professor and Head of the Department of Applied Chemistry at the University of Wales Institute of Science and Technology, Cardiff. Professor Williams runs a large research group in trace element chemistry at UWIST, and is also the chairman of the British Council Science Advisory Committee. He serves on numerous official bodies in the UK, including the Radioactive Waste Management Advisory Committee of the Department of the Environment, the Advisory Committee on the Safety of Nuclear Installations, and the Trace Element Speciation in Food Committee.

Professor Williams' main research interest is in 'speciation' — studies of the form in which a chemical exists under given conditions — and this, in turn, determines whether an element is mobile, bioavailable, beneficial or relatively harmless in the environment. Over the last twenty years Professor Williams has developed a computerised approach to speciation which allows studies to be made at concentrations far below those amenable to normal experimental techniques. This permits predictions of, for example, the influence of drugs on trace elements in the body, chemical reactions involved in industrial processes, the availability of metals in foods, and the likelihood of leaching of radioactive wastes.

A related research interest is in the determination of formation constants through precise glass electrode potentiometry, including the development of means of calibrating such electrodes. This is applied to studies of the thermodynamics and stoichiometries of metal-ligand complexes in aqueous solutions.

Among his achievements Professor Williams has published 181 research papers, 15 reviews and book chapters, and six books, including The Principles of Bioinorganic Chemistry and Analysis Using Glass Electrodes. Public lectures, and radio and television appearances number one hundred and seventy, in all five continents.

Professor Williams was recently awarded the Royal Society of Chemistry's Silver Medal for "The most meritous contribution to advances in chemistry relating to a better environment."

Dr R. B. (Bob) BUCAT

Dr Bucat is a lecturer in the Department of Physical and Inorganic Chemistry at the University of Western Australia.

He was awarded a PhD degree in Chemistry at U.W.A. in 1974 after studies of the photodecomposition of nitrate ions in aqueous solution. In more recent years, he has become interested in the problems of education in chemistry. As a result, apart from teaching courses in chemistry, he presents a course for final-year undergraduate students entitled "Chemistry For Teachers". He supervises Honours and Masters degree research projects in his Department, mainly in the fields of curriculum development and student understandings of chemical concepts.

Continued Next Page

CONFERENCE GUESTS Cont'd

From 1980 to 1984, Dr Bucat was seconded to the Australian Academy of Science as the full-time Supervising Editor of the Academy's School Chemistry Project. This very large curriculum project has developed a new-generation secondary school course that is based on philosophies derived from the inputs of the whole of the chemical and educational communities in Australia. If the course achieves its aims, chemistry in Australian schools will be more interesting, more enjoyable and more understandable — to the benefit of those going on to tertiary science courses as well as those who are not. Dr Bucat is now a part-time consultant for the Academy of Science during the implementation, information, in-service support and evaluation stages of the project.

In 1986, Dr Bucat was awarded the Medal of the Chemical Education Division of the Royal Australian Chemical Institute for contributions to education in chemistry. This medal has been awarded only three times.

Dr Ronald W. Ellis

Dr Ellis gained his BA in Biology from the University of Chicago, followed by a PhD in Biochemistry at Cornell University and an MBA in Business at the University of Maryland. Now employed as an Associate Director and Head of the Cellular and Molecular Biology Research Laboratory at Merck Sharpe and Dohme in Pennsylvania, his responsibilities include the direction of programmes in molecular biology, fermentation and the development of vaccines.

He is author of over 50 scientific publications and co-author of 15 patents, in biotechnology. Prior to his position with Merck Sharp and Dohme he was with the National Cancer Institute working with initial definition, cloning, and characterisation of rat oncogenes.

Professor Derek Saunders

Profesor Saunders graduated in physics from Imperial College in 1945 and became interested in polymeric materials early in his career, ultimately joining the Cranfield Institute of Technology in 1960.

In 1967 he was appointed to a personal chair in Polymer Physics and Engineering and became head of the Department of Materials in 1969. In 1981 he was seconded part time to become Director of the Teaching Company Scheme, a nation-wide programme sponsored by the Science and Engineering Research Council, the Department of Trade and Industry, and by industry itself, to promote active partnerships between academic groups and industry. The partnerships work at postgraduate level, in industry, to help improve industrial performance, give academics involvement in, and familiarity with, industrial activity, as well as training a group of graduates as future engineering managers.

Professor Saunders has worked for polymer interests within SERC for many years and chaired relevant committees. He was closely concerned in developing the concepts which led to the formation and development of the Polymer Engineering Directorate and was, for four years, a member of the Polymer Engineering Management Committee. He has served on many SERC, Government and academic committees concerned with polymeric materials and, more recently, with the development of much closer industrial/academic relationships.

Professor Saunders believes firmly that strong links between industry and academy are vital to the economic future since they can be instrumental in effecting major changes of attitudes amongst both industrialists and academics, to the benefit of both.

GRADES OF MEMBERSHIP

A Message from the President

The past months have seen an upsurge of interest in the grades of membership offered by the Institute, particularly at the non-corporate level. At its meeting in February, Council recognised the need for everyone to be aware of the current debate and elected to stimulate informed discussion by presenting the facts of the matter for serious consideration. A case for amalgamation of the non-corporate grades of Graduate, Technician, and Associate into a single grade to be known as "Associate" is presented by the Auckland Branch Committee. Dr P. K. Foster argues, on the other hand, for retention of the distinction between University degree and NZCS qualifications. I urge you to read these articles, to consider the matters carefully, and to discuss them vigorously at your Branch meetings, and to communicate your views through these pages. Council has decided to survey the corporate membership later in the year and to re-address the question of the non-corporate grades at its meeting in February next.

The existing and proposed structures are summarised below:

Present structure: University degree — Graduate — Member (after 4 years, approved professional experience, otherwise, to Associate) — Fellow;
NZCS — Technician — Associate (after 4 years, approved experience) — Member (with adequate standard of professionalism, knowledge and experience) — Fellow.

Proposed structure: NZCS/University degree — Associate — Member (university graduate, as above; NZCS holder, 8(?) years, approved post-NZCS experience) — Fellow.

Brian Halton
President

The Case for Restructuring Non-corporate Grades

The Auckland Branch Committee has for some years campaigned to have the non-corporate grades within NZIC restructured. Specifically it has been proposed that the Technician, Graduate and Associate grades be combined to form one grade to be known as Associate. That this issue has remained a subject for debate for so long does credit to the Institute, reflecting a willingness to submit to critical self-appraisal and amenability to change. As a result, the opportunity now exists for all members of NZIC to voice their concerns and preferences. The Auckland Branch Committee has been concerned that the diversity and terminology of the non-corporate grades introduced in 1976 are an unnecessary complication and an impediment to recruitment. We believe that for NZIC to remain truly representative of practising chemists, the time for change has come.

Background

There is an estabilised history of reorganising the membership structure and nomenclature within NZIC. The current system was introduced in 1976, although the student grade was added in 1981/82. As to be expected with all change, this new structure was even then not universally approved. However, the present impetus for the evolutionary change of amalgamating the three non-corporate grades dates to 1984. In the Annual Report for that year President Alan Mackney, former Managing Director, NZ Forest Products Ltd, stated:

"The real reason for concern in regard to membership lies in the indication that the Institute has little appeal to chemists in industry and seems to be losing the interest of many such members. I drew attention to this aspect of membership in my tour of branches and voiced the personal view that the technician grade appears to be regarded as inferior, yet it is the only grade open to holders of Certificate of Science, who form the backbone of much of industrial chemistry.

This feeling was very clearly supported in discussions at the "outposts" which are not associated with the Universities. In spite of the rejection of the proposed changes, I feel that there should be further consideration of the non-corporate status of the holders of the New Zealand Certificate of Science, but, at the same time, *stress there should be no lowering of the professional requirement for admission to corporate membership.*"

There is evidence that grass-root opinion in the NZIC now favours a single non-corporate grade, to be called Associate. Late in 1986, the Auckland, Waikato, Manawatu, Canterbury and Otago Branches balloted their members on the issue of amalgamation of non-corporate grades. Auckland, Waikato, Manawatu and Otago reported to Council in February 1987 that their ballots favoured amalgamation by more than 3 to 1. Canterbury favoured the status quo by a small majority. Members attending the Wellington Annual General Meeting had also favoured the status quo.

Terminology

The structure for non-corporate grades, whose members have no voting power, is needlessly complex. There is no need for NZIC to reinforce distinctions between tertiary education qualifications that are obtained quite independently of NZIC.

The term "Technician" is particularly unfortunate because it relates to a person's occupation — not to qualifications. Many BSc holders are now being employed as technicians. While possibly having less practical experience than NZCS holders, they are nonetheless differentiated as Graduate rather than Technician members. Conversely, many people with NZCS do not work as technicians and will not accept such a designation from the Institute.

Recruitment

The opinion has often been expressed within the Auckland Branch that the stigma attached to the label of "Technician" instils a reluctance on the part of many NZCS graduates to join NZIC. This is reflected in the number of members nationally in this grade — only 16 as of 30 April 1986. We notice in our branch a marked difference in the recruitment success of students from Auckland University and the Auckland Technical Institute.

An article by H. Offenberger in our Journal (June 1976) shows 418 NZCS were awarded in Chemistry (Biochemistry) 1963/1974. The author notes industry employed 60% of holders of NZCS in Chemistry. This was also a feature of the Manawatu Branch survey 1984/1985 of advertisements for "Jobs for Chemists", the results of which were published June 1986.

From 1977/1985 another 533 students received NZCS. The total now exceeds 1000.

Currently, there are three FNZIC's holding NZCS, 24 MNZIC's, 8 of whom also have degrees, 47 Associates and 16 Technicians — a total of 90 — less than 9% of the Certificates issued since 1963.

This trend is unfortunate in that many NZCS holders remain active chemists, in some cases rising to positions of authority in industry. To represent the profession of chemistry, maintain its standards, and to help practitioners make an appropriate contribution to society, we need the support of all chemists. A large and increasing number of them have the NZCS qualification. A rationalization of the non-corporate grades of membership should ensure that NZIC would encourage such potential recruits.

Standards

The main thrust of arguments against the amalgamation of

the non-corporate grades has traditionally been the fear of erosion of standards. Firstly, the basic academic qualification for non-corporate members would remain as the NZCS in chemistry/biochemsitry. This is presently the case for the Technician grade and so clearly there is no change in the entry standards. Secondly, there is no requirement to alter rule changes for the promotion from non-corporate to corporate status. Presently, both Associates and Graduates are eligible for promotion subject to satisfying the required sum of academic achievement and professional experience. This is assessed in an interview conducted by corporate members as nominated by individual branches and ultimately scrutinized by the Membership Committee appointed by Council. Changes in such procedures have not been proposed here.

Obviously a university degree confers in its own right a defined level of status. There is no need for NZIC to reinforce this independently obtained qualification at the non-corporate level. It is worth pointing out that under the present system Graduate members can only so remain for 4 years after obtaining a degree. If sufficient professional experience in chemistry has not been gained in that time, the Graduate is promoted to Associate rather than Member. Finally, by definition, non-corporate members are not professional members and hence the combination of *all* NZCS and BSc holders into a common grade does not alter professional standards within NZIC.

Although the career paths of chemists and their initial academic training become increasingly varied, the experience of our Membership Committee and Council is that there are few problems in deciding who perform "professional" roles in chemistry. This is a sound basis for the maintenance of the standards of NZIC's corporate grades of members. Supporters of the status quo that discuss changes in standards are redirecting the debate.

Conclusion

There are three principal reasons for proposing the replacement of three non-corporate grades by one, to be called Associate: (1) Simplification, (2) Recruitment, (3) The image of NZIC. All are related, with the second and third being more important to the growth of NZIC. Note there is no reference to the source of academic qualifications or occupation in the proposed grade. Also it should be stressed that **there is no change proposed in the designation of, or standards required for, corporate grades of membership.**

Since 1957 the annual rate of NZIC's increase has been about 38 members, although the number of chemists becoming eligible each year for membership has risen considerably. Unfortunately, therefore, NZIC represents a decreasing proportion of qualified chemists. The proposed combination of the Technician, Graduate and Associate grades will, in our belief, reverse this trend by improving the image of NZIC in the chemical community and stimulate recruitment by encouraging all young chemists, irrespective of academic qualifications, to seek membership.

The Auckland Branch Committee

Arguments Against The Proposal

The central issue is whether or not the Institute should reaffirm its role to be first and foremost a professional body, or whether it is primarily a learned society with correspondingly lesser regard for admission standards. The present structure flows directly and logically from the prime role of the Institute being the maintenance of professionalism.

The majority of Institute Members already get their professional status through their system of employment; Government, University and Research Associations are all employers with separate conditions (especially salary) for professionals. We should remember, however, that our industrial membership have no such protection, and that a loss in status can directly affect income. Past salary surveys have quantified this.

The present structure of membership was set up to accommodate technicians, to give them complementary status, and to offer full participation in the learned society activities. The structure has done nothing to inhibit either the operation of learned society functions, or the transfer to corporate membership of chemists with non-standard qualifications, but who have full professional equivalence. Indeed, there are many present Members who have qualified in this way.

Members should consider well before reducing that status aspect of our system.

Professional Matters

The proposal of a common non-corporate grade for all, whether of University or Technical Institute training, is subject to the following objections, given that professional standards are the prime objective:

1. The rights and status of corporate and graduate members are downgraded by the proposal, in that the existence of one non-corporate grade for all implies equivalance of academic standard. There is a substantial difference in academic standards of BSc and NZCS, directly measurable by the fraction of a degree credited by all NZ Universities to NZCS holders seeking a degree course. The exemption is uniform and of the order of the first year of university teaching.

2. While the proposal requires no rule changes in respect of promotion from non-corporate to corporate status, it has been accompanied by suggestions that the Commentary to the Rules could indicate that NZCS plus 8 years experience could be a guideline for professional equivalence. This constitutes a lowering of standards which would be extremely damaging to the present status of corporate members.

It is necessary to recall that it is only experience which is both **professional**, and also is obtained **after** the academic standard is achieved, that counts towards the present "standard" graduate route to corporate membership. Thus the proposal is effectively assuming that, as a matter of course, NZCS holders, in their first four years after graduation working **full time, as technicians** will absorb somehow the equivalent of Stage II and Stage III Chemistry at a University level (and incidentally will not have to be academically examined for it), **and** further that in their second four years of employment will also have been gaining professional, as distinct from technician, experience.

3. It is a key part of the present structure that to become an Associate, a technician has to have obtained experience, post-qualification, in parallel with the route to Membership. The associated status is no longer there in the proposal for career technicians.

4. The common grade implies that Universities and Technical Institutes do not have complementary functions, that their graduates do not have complementary roles, and perhaps worst of all carries the connotation that a technician does not have an important contribution to make, and a career to pursue, in his own right.

Recruitment

The matter of membership recruitment is important, as it appears to be the prime motive of the proponents of structural change. No-one would question the desirability of growth and of steady recruitment of young chemists, given maintenance of standards. Before major structural change of the type proposed is considered; however, there are two further points which lead to the proposals being either harmful or at best neutral to their prime origin.

1. The proposal is likely to affect adversely the recruitment of University graduates. By adopting a common non-corporate grade, the Institute would be telling University graduates (who incidentally are the principal source by far of our corporate membership) that we rate them no differently from people with the equivalent of only one university year of academic training.

2. Although the change may well attract more NZCS applicants in the short term, the long term effects should be considered. The Institute would be offering status by association

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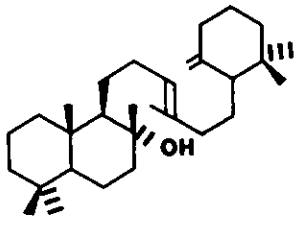
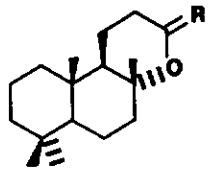
PERFUMES BASED ON AMBERGRIS SUBSTITUTES

R. C. Cambie, Chemistry Department, University of Auckland

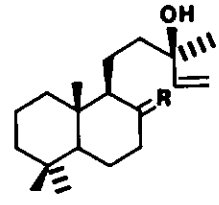
One of the most valued sources of an animal perfume is ambergris, a metabolic product of the sperm whale *Physeter macrocephalus*, which accumulates as a concretion in the gut of the animal. It can be obtained directly from the intestines of the whale but is occasionally found washed ashore as compact brown or grey pieces ranging in weight from several grams to several kilograms. Some controversy still exists as to how ambergris is formed;[1] current ideas are that it is only formed in old or diseased whales and then only when the animals are feeding on squid or cuttle-fish. It has been suggested that ambergris is produced as a result of irritation of the whale's stomach by the indigestible beaks of the squid and cuttle-fish.[2] Ambergris has been prized for hundreds of years for its unique fragrance and fixative power, and in Asia it has been claimed to have medicinal and aphrodisiac properties. In the form of a tincture, it homogenizes and exalts most perfume oils giving them, as a result of its fixative capacity, a tenacity which surpasses most other tinctures in the musk class. Because of its restorative properties it enjoyed great popularity in medieval Europe and it played a prominent role in the development of high quality French perfumes. Unfortunately, in recent times excessive hunting of the sperm whale has resulted in the virtual disappearance of ambergris from the world market* and in order to meet the needs of the perfume industry, chemists have sought to provide synthetic or semi-synthetic equivalents.



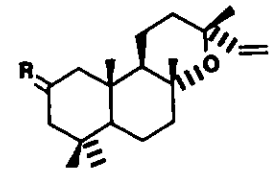
1.



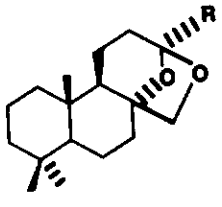
2. R = O
3. R = H_2



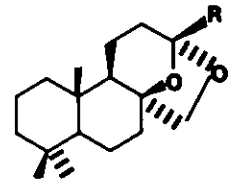
4. R = CH_2
5. R = βMe, α OH



6. R = H_2
7. R = O



8. R = CH_3
9. R = OCH_3
10. R = H
11. R = $NHCH_3$



12. R = CH_3
13. R = OCH_3
14. R = H
15. R = $NHCH_3$

The composition of ambergris has been known for many years[2-6] and it has been found that the odorous components amount to less than 0.3% of the crude material.[7] The characteristic odour of ambergris results from the presence of appreciable amounts (up to 74% of the extract)[8] of the tricyclic triterpene alcohol ambrein (**1**). Ambrein itself is odourless and the long-lasting odour property of ambergris probably results from a constant autoxidation of ambrein at the central double bond of the molecule with the formation of odorous products.[2] A study[9] has shown that many of the odorous compounds found in ambergris[10] can be produced in the laboratory by the oxidation of ambrein. This has led to the suggestion that singlet oxygen from the air is an active reagent in the biodegradation of ambrein, especially since porphyrins, which are known to be efficient photosensitizers, have also been identified in ambergris.

The elucidation of the structure of ambrein by Swiss chemists in 1947[11] and its subsequent degradation into odorous compounds showed that, in general, ambergris-type odorants have the *trans*-decalin skeleton which is present in many plant diterpenoids. As a result of the establishment of a relationship between ambreinolide (**2**), one of the major oxidation products of ambergris, and the plant diterpenoids manool (**4**) and sclareol (**5**), considerable interest in manool has been aroused both in New Zealand and abroad. Although there are several sources of the compound, New Zealand holds a unique position in that the native pink pine (*Halocarpus biformis*) has the highest known content (up to 6-8%) based on the dry material. Extensive work has been carried out on the production of synthetic substitutes for odoriferous compounds such as ambreinolide starting from manool or its related compounds manoyl oxide (**6**) and 2-oxomanoyl oxide (**7**). The latter two compounds co-occur as the major diterpenoids in the New Zealand silver pine (*Lagarostrobus colensoi*). Much of this work has been carried out within New Zealand by groups at the Universities of Auckland and Otago.

One of the most significant developments was the degradation of manool by potassium permanganate or osmium tetroxide-sodium periodate oxidations to the epimeric acetals (**8**) and (**12**), the former of which is reputed to have the strongest ambergris-type odour yet known.* These acetals have been used in the preparation of a wide variety of perfumes although there is no specialty product made from either substance. A semi-industrial production of the acetals from manool, reported by Demole[13] in 1964, heightened interest in the latter compound and a number of commercial firms within New Zealand have attempted to export manool or its relatives to perfumery companies in Europe and North America.

Footnotes:

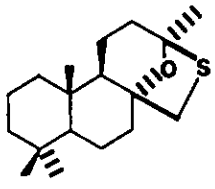
** It is reputed that two Northland fishermen recently found a large lump of ambergris on the shore near the Kaipara Harbour. Realising its importance they had it sent to France by the New Zealand agents of a French perfumery company. They were somewhat surprised but overjoyed to receive a cheque for $187,000.*

** Until recently the internal acetal (**12**) was also believed to have a strong ambergris-type odour. However, Ohloff and coworkers[12] have shown that the acetal (**12**) is perceived by most people as practically odourless and they attribute the earlier erroneous odour evaluations to contamination of samples by traces of the powerfully odorous epimer (**8**).*

Initially, in the early 1960's, a price of $16/lb was offered for crude manool and an Auckland firm supplied some 500 lbs as a trial shipment, this material being successfully employed in perfume manufacture.[14] However, the firm lost its advantage when its European customer Firmenich et Cie balked at an increase in price. A survey by the New Zealand Forest Service at about this time showed that *Halocarpus biformis* grew mainly on the West Coast of the South Island and that its total volume was at least 750,000 cubic feet, representing 10,200 tons of dry timber from which 800 tons of manool could be produced. At a then (1964) price of $10/lb for the compound, the gross value would have been of the order of $6m.[15] Another estimate indicated that there were sufficient trees on the West Coast to supply 20 tons of manool per year for a period of 25 years.[15]

Methods for the large scale extraction of manool from the pink pine were investigated by members of the Chemistry Division of DSIR, Petone, in the early 1960s.[16] Early attempts were not entirely successful but later, two alternative methods were developed.[15]

One involved solvent extraction followed by vacuum co-distillation of the extract with glycerol and centrifugal separation of the crystalline manool from the mother liquors. The second method involved radio frequency capacitative heating of the wood chips in a temperature-controlled chamber under vacuum to distill the manool directly from the chips. Little became of the second method, but the firm of U.E.B. Industries Ltd. in Auckland took up the production of commercial manool using the first extraction technique. Despite initial success and some patented research on the development of the internal acetals from manool,[17] a decreasing market and increased costs saw U.E.B. cease production after only a few years of operation.



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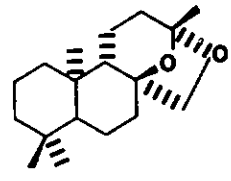

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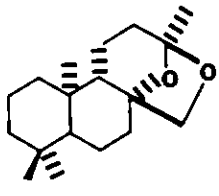

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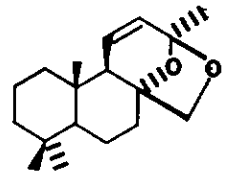

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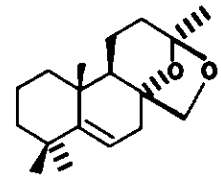
Meanwhile, work within the N.Z. universities and in overseas laboratories on analogues of the odoriferous acetals was continuing, manool becoming one of the starting materials for the investigation of structure-activity relationships in this particular series of odorants. Most of the current theories concerned with the phenomenon of odour postulate a relationship between the type of odour and molecular structure. Bicyclic compounds possessing the odour of ambergris usually have a *trans*-fused decalin skeleton and many possess the tricyclic oxide-type structure which is found in the naturally occurring diterpenoid manoyl oxide (**6**). Variation in the molecular geometry near the oxide group can lead to a pronounced effect on the odoriferous properties, and much research has been expended in attempting to define more closely the structure-activity relationships. In the ensuing discussion, only the work carried out within New Zealand is highlighted.

Other acetals of importance which have been derived from manool are the intramolecular ortho esters (**9**) and (**13**)[18] and the noracetals (**10**) and (**14**),[19] Cambie and Palmer[20] establishing that, as for other isomeric pairs, only the C 13-H ∝-substituted epimer (**10**) possessed a strong ambergris-type odour. The nitrogen derivatives (**11**) and (**15**)have been prepared recently and their odours are "being further evaluated",[21] Grant having shown earlier that the oxothiolan (**16**) possessed a very weak woody odour which was inferior to that of the oxygen analogue (**8**).[22] Compounds in the *ent*-15, 16-dinor series, *viz.* (**17**) and (**18**), have odour strengths far below that of their enantiomers (**8**) and (**12**) and, in addition, the pair (**17**) and (**18**) show little difference in odour quality other than a strong anosmia effect.[23] A loss of intensity with unchanged tonality occurs on introducing a double bond in the molecule as in the compounds (**19**)[24,25] and (**20**).[26] This is also the case on going from the dehydrogenated compound (**21**) to the saturated ether (**3**).[27,28] Inversion of the acetal group as in (**22**) leads to no change in the odour quality[29] while substitution of the C 13 methyl group of (**22**) by a hydrogen atom results in the loss of the odour properties of the nor-compound.[30]



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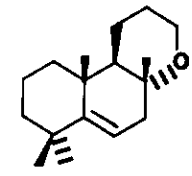

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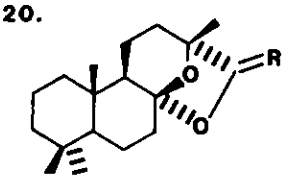


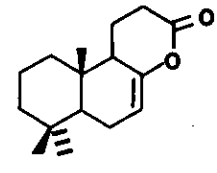
22. R = H_2

23. R = O

A number of other compounds derived from manool have also been assessed for their odour characteristics.[31,32] For example, manool can be converted in a single stage reaction into the lactone (**23**) which has an ambergris-type odour.[33] A detailed discussion is beyond the scope of this article, but full details have been recorded in a review by Vlad.[34] Interest in the derivatives of manool heightened with the discovery that compounds such as manoyl oxide were present in certain strains of Turkish tobacco.

Cambie and co-workers have degraded 2-oxomanoyl oxide (**7**) to make labdanyl ethers substituted in the 2-position by oxygen. Such compounds belong to the same odour type as their unsubstituted analogues[28] but have weaker and somewhat sweeter odours. In contrast, derivatives which are oxidised at C 6[26] are odourless. Manoyl oxide can be converted into the unsaturated lactone (**24**) which is used by the Reynolds Tobacco Company in the U.S.A. as a tobacco-flavouring agent[35] and it has also been converted into the odorferous five-membered oxide (**25**)[36] known commercially as Ambrox. The enol ether (**27**) is an important intermediate for the preparation of perfumery fixatives.[37] The latter compound has been synthesised from manoyl oxide via oxidative decarboxylation of the acid (**29**), and the corresponding keto-oxide.[28] These and other oxidation products have served as important intermediates in the synthesis of perfumes.

The methods of synthesis of the oxides (**25**) and (**26**), known



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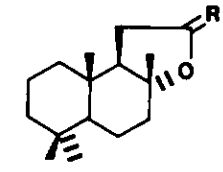
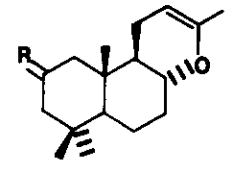


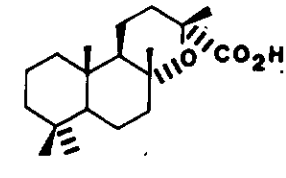
25. R = H_2

26. R = O



27. R = H_2

28. R = O



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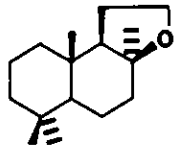
as Ambrox and Ambroxide, from sclareol (**5**) were the first in this area to be patented and numerous modifications of individual stages have been made subsequently in order to adapt them to industrial conditions. Recently, Cambie and Palmer[20] have prepared a series of five-, six-, seven-, and eight-membered ring dioxa compounds which are analogues of the commercially available odorants Homofixateur (**3**), Ambrox (**25**) and Isoambrox (**30**). All were shown to possess odours of the ambergris type, the odour decreasing in intensity as the size of the dioxa ring was increased. This work has been extended to include demethyl analogues of Ambrox and Isoambrox, starting from podocarpic acid (**31**)[38] which is readily available from the New Zealand rimu (*Dacrydium cupressinum*).



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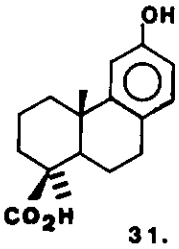

31.

During the last 10-15 years there has been considerable growth of interest in the perfumes obtained from labdanoids such as manool, manoyl oxide, and 2-oxomanoyl oxide, as evidenced by the increasing number of publications on the topic. The intensification is due in part to the fact that these compounds are present in tobacco, imparting to it special organoleptic properties, and to the fact that addition of these compounds to various kinds of tobacco improves their quality. Their value for perfumery has made the synthesis of their degradation products not only of academic but also of practical interest. Not only do they have highly effective properties as perfumes but they also possess a complex odour which embraces a wide range of different shades. The discovery that oxygenated analogues of Ambrox with comparable odours can be prepared from the readily available podocarpic acid opens up further potential for the development of a fine chemical industry in New Zealand. In 1971 the author expressed the opinion that "it will be necessary to produce an odoriferous derivative on a semi-industrial scale before our raw materials such as manool, manoyl oxide, and ketomanoyl oxide are going to be of much value to New Zealand".[14] However, as yet, little interest has been exhibited in the commercial prospects of these compounds.

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Continued from page 30

with the University graduates, and this could logically lead to some increase in numbers initially. However, in the long term the status attraction would disappear as a new lower average standard became established, and the same situation would exist as exists today.

No consideration has been given to the range of functions and services the Institute performs. If we are concerned about our membership, surely these are what should be addressed, rather than a structure which does nothing to inhibit them.

While the poor growth rate of membership is the prime reason for the proposed change, there has been no basis established to show that the structure is the problem. For example, no survey has been carried out of those who have failed to join, whether from Universities or Technical Institutes.

General

It has been said that the present structure does nothing to recognise that a significant number of University graduates are employed as technicians. This argument is used by the Membership Committee and Council for **not admitting such people to corporate membership.** It is no argument for lowering the professional standard.

As a matter of practical application, the Membership Committee, in considering promotion to membership would have to consider the University graduates and NZCS holders as distinct populations, because of the large difference in academic attainment, if present standards are to be maintained.

Conclusion

The choice is simple. It is between maintaining the professional body role of the Institute as its first concern, particularly for the protection of those members employed outside systems with a professional career structure, and changing the structure of the Institute in a way damaging to the present professionalism.

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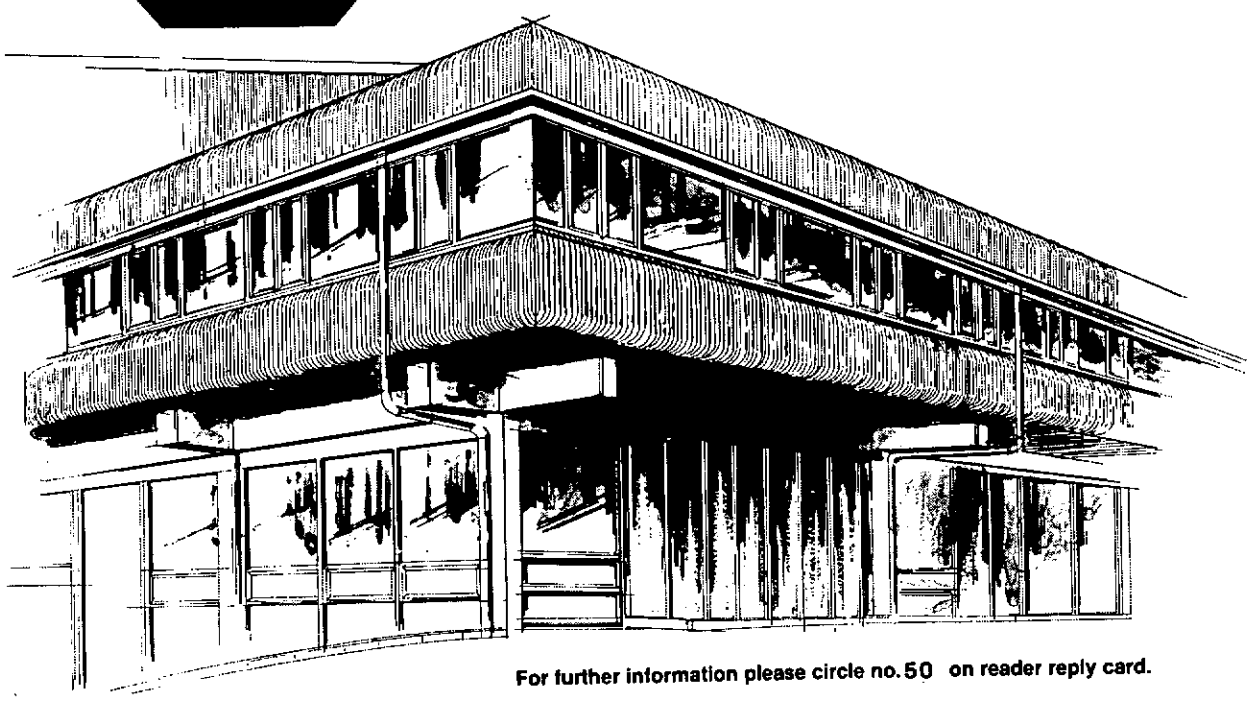

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THE DEPARTMENT OF CHEMICAL AND PROCESS ENGINEERING, UNIVERSITY OF CANTERBURY

A. G. Williamson,
Professor and Head of Department, Chemical and Process Engineering, University of Canterbury.

In May of this year the School of Engineering at the University of Canterbury celebrates its centenary. In this article Arthur Williamson reports on the development of his own department, within the school.

Industrial Chemistry to Chemical and Process Engineering: 1944-1987

Although the Engineering School has reached its hundredth year, Chemical Engineering is still a comparative newcomer to the fold. Chemical Engineering at Canterbury University was born in the Chemistry Department. It traces its origins back to the interest of the early professors of Chemistry, initially the controversial Bickerton who was himself trained in the Royal School of Mines; and later Evans and Denham, in the applied aspects of chemistry. In 1944 this interest was formalised as a postgraduate "Diploma of Industrial Chemistry" and Mr (later Professor) Stan Siemon was appointed to look after the Diploma teaching. The Chemical Engineering degree was introduced in 1945, and in 1950, Siemon was joined by Dr Thomas Hagyard. Together, these two taught the whole of the course. In those early days Chemical Engineering was firmly tied to Chemistry — to the extent that the course was a five-year one and every chemical engineering student studied chemistry to degree level and graduated with the double degree BE, BSc. In 1952, the Department of Chemical Engineering was established as part of the Engineering School, though it was not until 1957 that a chair in Chemical Engineering was created.

When the School moved to the Ilam site in 1960, Chemical Engineering — the staff of which had risen to four — joined the other engineers. In that same year, the degree was restructured from a five-year BE, BSc to a four-year BE to match the other engineering degrees in duration. Since then the Department, although still the smallest of the four at Ilam, has grown to a staff of 11 academics, 10 technicians and two secretaries, and an average annual intake of 30-35 undergraduates. It has an active postgraduate group of 12-15 students among whom four or five nations are usually represented.

A wide range of subjects are covered in the research group. Current activities include studies of the fundamentals of drying processes, compressibilities of gases, the fluid mechanics of blood, the structuring of computer models for process control systems, corrosion of copper, liquid-vapour equilibria, the mechanisms of transport of moisture in timber, spontaneous heating of coal, and solubilities of lipids in supercritical gases.

Of the engineering disciplines, Chemical Engineering has long proved to be the most attractive to women students and although the proportion of women students is still lower than we would like to see, most classes have five or six women students. Employers of chemical engineers appear to have little difficulty in accepting women graduates, although one still hears stories about some large companies, where payroll division staff cannot believe that they are dealing with a woman engineer and persist in making pay cheques out to Mr X rather than Miss X or Ms X. It seems that the discrimination lies not with the employers or the engineers but with other staff. Nevertheless, there are now women chemical engineers in senior positions in a number of companies and consultancies in New Zealand.

Once chemical engineering had moved away from the Department of Chemistry, the absence of a strong and direct applied chemistry connection was felt. In a positive move to fill this gap, new chemistry courses in Chemical Process Technology were established. There is now a spectrum of training available to students from pure chemistry, through chemistry with a strong applied component, to chemical and process engineering. The bond between the Chemistry and the Chemical Engineering Departments is still strong, with each providing some of the teaching required by the other.

Like other engineering subjects, Chemical Engineering has changed markedly over the past decade or so. These changes have come about as a result of our increasing knowledge about the fundamental phenomena involved in large scale chemical processing, as a result of the increasing demands of industry for more sophisticated processes, and as a result of the ability of computer methods to handle systems with more and more complicated interactions. With this last named development, it is now possible to contemplate the development of large dynamic models of complete process plants and to study the consequences of changes in operating conditions in the whole plant. Indeed, in some plants, the operators are trained using a computer simulation of the whole process and plant in much the same way as airline pilots are trained using a flight simulator, and the process engineers use the computer models to examine and solve in advance the potential problems which could arise in the operation of the plant.

Applications of Chemical Engineering in New Zealand

In many countries, chemical engineering is seen as the business of large petrochemical operations, such as refining, and the production of synthetic materials, such as the plastics and fibres which are used so widely. In New Zealand, chemical engineering has had, until recently, rather a different face. We had one simple oil refinery and no petrochemical-based industries. Where, then, did New Zealand's chemical engineers find work? To begin with, many didn't. Although the educators knew what chemical engineers did, the employers did not. I can recall a chemical engineer who now heads one of New Zealand's largest computer software companies, trekking around potential employers explaining to them what a chemical engineer was and why they needed one!

With the consolidation of the dairy industry from hundreds of small dairy factories, each processing the milk from a few herds, to a few dozen very large factories handling up to 500,000 litres of milk per day, the dairy industry has, in a few years, completely changed its character from a small cottage industry to a major process industry with large and sophisticated equipment such as spray dryers, continuous butter making machinery and use of "exotic" membrane processes such as ultrafiltration and reverse osmosis. For the past several years, the dairy industry has been one of the biggest single employers of chemical engineering graduates and some exciting process developments have been taking place in that industry. Dairy processing is no longer the bucolic activity of yesteryear. The modern day dairy-maid is a highly trained chemical engineer applying the most advanced processing methods to the production of a wide range of products, including not only the traditional butter and cheese, but also dried milk powders, whey protein, lactose and even alcohol, all to stringent standards of hygiene and product specification.

The pulp and paper industry has always been big in New Zealand. It started on a grand scale and continued that way. In the beginning, it took a few chemical engineers but much of the technology was imported. Now, however, this industry is truly indigenous and leans more and more on local technology and local skills. Pulp and paper making consists of a series of more or less well understood processes — pulping, bleaching, washing, drying — all of which interact with each other, so that changes in one step can greatly affect other steps in the process. This is the kind of situation in which computer modelling is of great help, and work currently being carried out in the Department of Chemical and Process Engineering aims to build upon the modelling expertise recently introduced by research fellows supported by Tasman Pulp and Paper Limited.

While a large contribution to our current transport fuel needs comes from natural gas, mainly as CNG, LPG and synthetic petrol, these fuel sources are of limited life and we shall, in due course, have to rely on other sources based perhaps on coal, perhaps on solar energy. Members of the Department have taken a major part in studies of potential fuel sources leading up to the choices which have been implemented. They have also been involved in handling some of the problems of the current technology and are still working on potential fuel sources such as esterified vegetable oils and tallow. Only recently it has been suggested that this technique could be used to solve the problem of the European Butter Mountain by turning it into diesel fuel and glycerol for the cosmetics industry!

Course Structure

The Chemical and Process Engineering Degree begins with the standard Intermediate course of Chemistry, Mathematics and Physics. This is followed by a First Professional Year in which the new concepts required in chemical engineering such as heat transfer, mass transfer, fluid mechanics, reactor kinetics, and process modelling are taught, along with expansion in Chemistry and Thermodynamics. In the Second and Third Professional Years, these subjects are further developed, and subjects like particle technology and process control, applied electrochemistry and specific applications such as drying technology and corrosion are introduced. The final year course aims also to integrate the individual subjects of the course in a major design project and a major research project in which students are encouraged to develop their independence of thought and their innovative capacity.

Recognising the growth of the wood processing industry, the Department has, in 1987, instituted a Wood Process Engineering option with minor modifications to the standard Chemical and Process Engineering course which generate a bias in the final degree towards the needs of the wood processing industry.

More generally, the Department aims to produce a good proportion of its graduates with a degree which is broadly based yet rooted in the fundamentals of the subject, who are able to adapt to a wide range of industrial needs.

Graduate Employment

Recently, graduates in Chemical and Process Engineering have had no difficulty in finding employment in the petrochemicals (energy or gas based), dairy, pulp and paper, and fertiliser industries, and with the major consulting firms who have, over the past few years, expanded their activities to include consulting in the process industries. There is also a host of smaller but nonetheless vital processing activities which employ only one or at most two Chemical Engineers who are required to be independent and innovative.

As we look to the future there are a host of new challenges. Mankind's belated concern for the environment offers many opportunities for the application of the Process Engineer's skills. The shrinking fossil energy resource provides a challenge for innovative approaches, both in conservation and substitution of our existing energy forms. There is a huge area of medical research with unsolved problems, many of which can be studied by using the Chemical Engineer's understanding of mass transfer, heat transfer, fluid mechanics, thermodynamics and process dynamics. The next generation of Chemical Engineers will make contributions in areas and in ways undreamed of by the applied chemists of 50 years ago.

NEW ZEALAND INSTITUTE OF CHEMISTRY (INC)

NEW ZEALAND BIOCHEMICAL SOCIETY (INC)

1987 CONFERENCE

Theme: Commercialization of Chemistry

Auckland, New Zealand, 24–28 August 1987

This year the annual NZIC/NZBS conferences enter a new era.

The programme has been planned to keep delegates together throughout the conference, facilitating personal and small group communication. To this end the registration fee includes payment for lunches on each day and for various evening functions. Since the overall fee may present problems in reimbursement for some members, the receipt if desired may be made out to indicate 50% of the cost as registration and 50% as subsistence costs.

It should be noted that the $80 registration fee for students for Tuesday–Friday represents a considerable saving over the regular registration cost and includes all meals and functions.

There are of course options to allow attendance on a daily basis. The daily cost includes meals and social functions as appropriate for each day.

Small specialist group discussions will be encouraged. Arrangements can be made for these if you indicate in Section D of the registration form.

A series of easy to follow daily options give you complete access to the following conference events, all of which are included in the comprehensive weekly rate:

1. Five days of conference activity comprising:
   a) Monday at the Sheraton Auckland. Keynote speakers will include policy and decision makers from chemistry and biochemistry, from all sectors, from New Zealand and abroad,
   b) Tuesday through Friday at the University of Auckland. There will be plenary and sub-plenary sessions on the themes of Resource Development and Pharmaceuticals on Tuesday, Food Technology and Education for Employment on Wednesday and Biotechnology and The Analyst in Industry on Thursday. Biochemistry and NZIC specialist group sessions will also take place during these days. On Friday there will be a series of topical workshops on FTIR, Molecular Biology, Advances in Chromatography, Materials Failure and the Construction Industry.
2. Three days of Chemistry and Industry Trade Fair, CITF '87.
3. All lunches including at the Sheraton on Monday.
4. Evening functions comprising;
   a). Sunday mixer,
   b). Conference banquet at the Sheraton on Monday,
   c). Evening function at the Auckland Institute and Museum on Tuesday and
   d). CITF dinner on Wednesday.

Within this registration form you will find details of accommodation as well as other items of interest. Please read it through carefully and respond where your response is required. When we receive your reply we will send you details of paper and poster presentation, confirmation of accommodation, accompanying persons programme as appropriate and a GST invoice.

RETURN THIS FORM TO THE CONFERENCE ORGANISER, BRIAN FAIRCHILD, PRIVATE BAG, BROWNS BAY, AUCKLAND 10. PLEASE NOTE MEMBER'S PREFERENTIAL REGISTRATION COSTS APPLY ONLY UNTIL JULY 1.

SECTION A: PERSONAL DETAILS

Title (Prof, Dr, Ms, etc) _____ Family Name _____ Given Name _____

Institution/organisation/company _____ Position held _____

Name and organisation as you wish them to appear on your name badge.

_____

SECTION B: ACCOMMODATION

Please complete (1), (2) and x the appropriate box.

1. I do not wish the conference committee to reserve accommodation on my behalf because I am making my own arrangements ☐

2. Please make accommodation reservations for me as follows (number your choices in order of preference: tariffs quoted are per room per night).

	Single	Double	Twin
Sheraton Auckland	☐ $170	☐ $170	☐ $170
Grafton Oaks Motor Lodge	☐ $100	☐ $110	☐ $110
University Hostel (bed and breakfast)	☐ $ 30	☐ $ 60	☐ $ 60

If you are sharing accommodation with another conference registrant, please indicate his/her name

_____

Would you like to share accommodation with another person if it can be arranged? Yes ☐ No ☐
If yes, please indicate your sex ☐

Arrival date: _____ Departure date: _____

Arrival time if after 6.00 pm _____

DEPOSIT: One night's tariff is required to secure your reservation. This deposit will be forfeited if the room is not occupied on the date stated.

Cost of deposit _____ THIS IS TOTAL B

ACCOMMODATION RESERVATIONS NOT ACCEPTED BY THE ORGANISER AFTER JULY 1

SECTION C: FREE COMMUNICATIONS

Do you intend to submit a paper Yes ☐ No ☐
a poster Yes ☐ No ☐

Please give title and specialist area _____

_____

Send Abstracts to Rodney Norris, Chemistry Division, DSIR, PO Box 2224, Auckland 1.

DEADLINE FOR ABSTRACTS IS JULY 1

SECTION D: FRIDAY WORKSHOPS

It would assist our organisation if you would indicate which workshop you intend to attend on Friday.

Molecular Biology ☐
FTIR ☐
Other ☐, or other day. Please attach an explanatory note.

Advances in Chromatography ☐
Materials Failure in Construction ☐

SECTION E: ACCOMPANYING PERSONS TO CONFERENCE FUNCTIONS

Family Name _____ Given Name _____

Family Name _____ Given Name _____

Date	Event	No. of Persons	Cost	Payment
Sunday 23	Opening Mixer	_____	$10	_____
Monday 24	Sheraton Dinner	_____	$50	_____
Tuesday 25	Museum Evening	_____	$20	_____
Wednesday 26	CITF Dinner	_____	$25	_____
			Total payment	_____

THIS IS TOTAL E

Would you like details of the accompanying persons programme Yes ☐ No ☐

SECTION F: REGISTRATION FEES

	NZIC or NZBS member	Non-member	Student*
Day 1 Sheraton	$125 ☐	$150 ☐	$125 ☐
Dinner only	$ 50 ☐	$ 50 ☐	$ 50 ☐
Day 2 Tuesday	$ 80 ☐	$100 ☐	$ 25 ☐
Day 3 Wednesday	$ 80 ☐	$100 ☐	$ 25 ☐
Day 4 Thursday	$ 80 ☐	$100 ☐	$ 25 ☐
Day 5 Friday	$ 80 ☐	$100 ☐	$ 25 ☐
Whole week rate) Includes all meals)	$300 ☐**	$400 ☐	$ 80 ☐*
THIS IS TOTAL F	_____	_____	_____

*NOTE: Students must be student members of the NZIC or NZBS and bona fide students. There is no student rate available for the Monday at the Sheraton, and the whole week rate for students is for Tuesday–Friday only.

**For accounting purposes only, the weekly registration fee is $150, with meals and other incidentals bringing the total fee to $300 (GST exclusive). Daily rates can also be divided to indicate a separate registration cost if desired.

MEMBER & STUDENT RATES ONLY APPLY TO REGISTRATIONS RECEIVED BEFORE JULY 1

SECTION G: PAYMENT OF FEES

FEES

		Payment	
1. Delegate Registration Fee	(Total F)	$ _____	
2. Accompanying Person Fee	(Total E)	$ _____	
3. Accommodation Deposit	(Total B)	$ _____	
	(Total G)	$ _____	(Total of F + E + B)
	10% GST on Total G	$ _____	
	I enclose payment of	$ _____	(Total G + GST)

PAYMENT

Please indicate if you would like your receipt to show separate amounts for registration and subsistance ☐

Registrants should pay by credit card or by personal or company cheque. Cheques should be made payable to NZIC Conference 1987.

If you wish to pay by credit card please complete all of the following:

Visa ☐ Express ☐ Diners Club ☐ Mastercard ☐

Card Number _____ Expiry Date _____

Card Member Account Name _____

Account Billing Address _____

_____

_____ Please debit my account $ _____

Signature _____ Date _____

INSTRUCTIONS FOR ABSTRACTS: NZIC/NZBS CONFERENCE '87

Requirements for preparation of Abstracts

1. **Size and presentation.** Abstracts must be typed within an area 194 mm wide by 124 mm high. Use 8 mm margins on A4 size paper and trim paper to 210 mm wide by 148 mm high (half A4 size). Please ensure that the abstract is free of typographical and grammatical errors and produced using an electric typewriter or word processor printer (at least letter quality) if possible in 12 pitch with a serif type face. An original and one copy are required.

2. **Title.** Upper case.

3. **Authors.** Lower case except for first letters and initials. Presenting author first.

4. **Organisation.** Lower case, underlined and should start with the affiliation of the presenting author followed by that of the other authors.

5. **Text.** This should be as informative as possible within the limits of space available, and should contain relevant information on methods and results. Conclusions drawn from the results should be clearly outlined: Statements such as 'The results will be discussed' are not acceptable. DO NOT INDENT. Leave one line space between paragraphs.

6. **Acknowledgements.** If necessary to appear one space below the text.

7. **References.** In the text the citation should be numerical in order of use. References to be listed, no heading, one space below the text (or acknowledgements) and given in numerical order, citing all authors, the year of publication (in brackets), the title of the journal (abbreviated in accordance with the most recent edition of the World List of Scientific periodicals), volume number, and the first and last page numbers. References to articles in books should consist of the names of authors, year of publication, title of book, the editors, page numbers, place of publication and publishers.

8. **DO NOT FOLD THE ABSTRACT — MAIL IT FLAT.**

9. Send Abstracts to Mr Rodney Norris, Chemistry Division, DSIR, PO Box 2224, Auckland. 1

SAMPLE ABSTRACT

EFFECTS OF COLUMN LENGTH AND PARTICLE SIZE ON SEPARATION OF AMINO-ACIDS.
B. Alanine, B. Aminoisobutyric and A. Acid.
Department of Biochemistry, University of Miranda Hot Springs.

In previous studies (1,2) it has been shown that the separation of aminoacids from physiological fluids is greatly enhanced by the use of a dedicated aminoacid analysis system. Gradient systems have been found to produce superior resolution (3), but have not had the capacity to satisfactorily resolve the many components (more than 3578) present on McTavish single Malt/Mutton Cadet '04 blend. This analysis may give insights into the causes of post-dipsomanic coma polyuria.

We have tested the combined effects of resin and silica-based anion and cation exchange columns and found substantial losses of silica-based material when mobile phase pH values in excess of 12 were used. Resolution was greatly enhanced by the use of 1-micron particle size but this produced run times in excess of 1 000 min. Column lifetimes were extended by the use of deproteinised plasma and serum but this was more tiresome in practice.

The optimal conditions were found to be 0.1 mmol/l citrate pH 2.53 with a gradient to 20.09 mmol/l ascorbate pH 7.99 over 45.6 min on a 5 micron OFS-sil column. Flow was programmed from 0.5 ml/min to 10.11 ml/min from 10 to 30 minutes. The consequent pressure gradient was from 200 psi to 12 050 psi. No problems were encountered with mobile phase leakage. Column lifetime was 3.078 h (mean, SD=0.002h, n=4). The parameters for the resolution equation were too complicated to calculate (4).

1. Alanine, A., Threonine, S.D. and Acid, A. (1984). J. Biochem. Chromat. 45, 345-455
2. Leucine, K.L. (1979). Everything You Ever Wanted To Know About AA's, ed. Isoleucine, F.G., pp33-77, Auckland, KZ7 Press.
3. Phenylalanine, P.O. (1935). J. Sep. Chem. Sci. 2368, 1-2.
4. Valine, X.S. and Glycine, P H. (1990). J. Comp. Math. Chromat. 55, 007-999.

COUNCIL NEWS

1987/88 Subscriptions

The subscriptions for the 1987/88 financial year were set by Council at its meeting in February and are as shown below. Most will notice the rebate for early payment has been double to $10.

A large proportion of our subscriptions are collected before August 31, but the increased costs and time spent in collecting the remainder have persuaded Council that a greater incentive for early payment is necessary. For the majority who claim the rebate, the increase in subscription received by the Institute has been kept down to $5.

Council continues to look to an Institute with permanent full-time ofice staff to meet the ever-increasing demands of our membership. In this regard the capitation fee to the Development Fund has been increased from $5 to $6 per corporate member. It is hoped that the remaining modest increase will defray the increased postal and administrative costs and leave the organisation in a satisfactory financial position.

As professional body subscription rates go, the new charges are still modest. Nonetheless, Council is very conscious of the need to provide value for the monies it receives.

Fellows/Members: $80 (less $10 if paid by August 31) + GST

Associates: $70 (less $10 if paid by August 31) + GST

Graduates/Technicians: $50 (less $10 if paid by August 31) + GST

Students: $10 + GST

B. Halton
President

Dr Brian Halton presided over a meeting of Council in Wellington on Tuesday 3rd and Wednesday 4th of February 1987. Professor K. M. Mackay and Drs M.H.G. Munro and J. Garside, Waikato and Canterbury Branch Delegates and the Auckland Delegate by proxy, respectively, were welcomed as new members of Council.

In his report to Council Dr Halton indicated that his aims for the year were to work towards improving the efficiency of the administration and also the public "visibility" of the Institute. In regard to the latter delegates were reminded that branch committees had been asked last year to make contact with their local MPs and also to arrange for appropriate members to be nominated as "contacts" for the local media. Since the meeting, Dr Halton reports that he has written to the Prime Minister, the Minister of Science and Technology, the Leader of the Opposition, the Opposition Spokesman on Science, and all other Ministers with science-related portfolios, expressing the Institute's support for the "Beattie" report and urging Government to give serious consideration to its recommendations.

Chemical Education Trust

The documents establishing the Institute's Chemical Education Trust fund have now been drawn up, and formal recognition by the Department of Inland Revenue, for tax exemption purposes, is expected shortly. Some minor rule changes, namely the deletion of rules 17.2.4 and 17.2.6, were approved by Council in response to legal advice.

Alan Mackney (Chairman) and Professors Geoff Malcolm and George Petersen have accepted Council's invitation to act as Trustees. It is expected that letters inviting contributions to the Trust fund will be sent out to members of the Institute, chemical companies, and other potential contributors in May 1987.

Hazardous Chemicals Committee

Council acknowledged receipt of a copy of the submission by the HCC to the Labour Department with regard to the paper on *Assessment and Control of Major Chemical Hazards*. A summary of this document and call for comments was published in Chemistry in NZ last October (p155). A copy of the committee's submission will also be published in the Journal as space permits.

In keeping with Council's policy of rotating its committees around the branches, Dr Wayne Temple, Chairman of the HCC, has suggested that the time would now be appropriate for relocation of his committee. Canterbury Branch have been asked to consider taking on this task.

Member Services

In October of last year the President wrote to the Council of Auckland Technical Institute, and subsequently to the Minister of Education, expressing concern at the conditions under which chemistry is taught at the Institute. A response has now been received from the Minister acknowledging that the facilities are indeed "not up to standard". A staged programme of upgrading the laboratories was to have been commenced towards the end of the 1986/87 financial year, and should continue in subsequent years until "all laboratories are of an acceptable standard".

International Chemistry

The Institute will be officially represented at a number of international meetings and conferences over the next twelve months. Dr Halton is to attend a planning meeting in Tokyo next July, for the 1989 Chemical Congress of the Pacific Basin Societies. Professor Arthur Campbell will attend on Dr Halton's behalf the 11th International Meeting of Chemical Society Presidents, in New Orleans in August/September. Mr Hitchings will act as the NZIC's official representative at the joint RACI-NZIC Bicentenary Conference in Hobart next January.

An invitation has also been received for the Institute to nominate an official delegate to the FACS Biennial Assembly to be held in Seoul, June 29-July 3 1987. A limited amount of finance is available for this. Any member likely to be in the region at the time and who could fulfill this role should advise the General Secretary as soon as possible.

NZIC Annual Conferences

The following timetable for future conferences of the NZIC was tentatively agreed to: 1988, Manawatu; 1989, Waikato; 1990, Wellington; 1991, Canterbury. In addition though, delegates were asked to encourage discussion within their branches with regard to possible changes to these events. In particular the type of conferences that members would prefer, the timing during the year, and the frequency should be considered.

Honours and Awards

Members are reminded of the following closing dates for Institute Prizes:

ICI Prize, Shell Prize for Industrial and Applied Chemistry, 30 April.

Chemical Essay Prize, 30 June

ACA/NZIC A C Kennett Award, 31 July.

In addition, nominations for the 1988 RACI-NZIC Visiting Speaker Award close on 30 June 1987. Further details on the above are given in the 1987 Yearbook.

Members are also reminded that suggestions for nominations for Fellowship of the Royal Society of New Zealand, and for Queens Honours may be made at any time through Council's Honours Committee.

Meetings

A meeting of Standing Committee is planned for 28 April 1987. The next meeting of Council will be in Auckland, 22 and 23 August, prior to the Annual Conference.

B W Graham, Editor
March, 1987

Membership Changes

3 February 1987

Honorary Fellows:

Seal, Kenneth Edmund, CBE Msc (London) M Aust IMM

Barrer, Richard Maling, DSc, FRS, FRSNZ

Fellows:

Body, Dennis Roger, MSc. (NZ) Applied Biochemistry Divn. DSIR Palmerston North. (Scientist)

Members:

Bingham, Alistair Gavin, BSc (Hons) PhD (Massey). National Environmental Chemistry & Acoustics Laboratory, Dept of Health, Auckland. (Scientist).

Brothers, Penelope Jane, MSc (Auck) PhD (Stanford). Chemistry Dept University of Auckland. (Post-Doctoral Fellow).

Members from Graduate:

Jones, Evan John, BSc. East Coast Farmers' Fertiliser Co. Napier. (Works Chemist).

Stevens, Earl Victor John, BAgrSc. (Hons) PhD (Massey). Dept of Animal Science, Massey University. (Lecturer).

Associates:

Copplestone, John Charles, NZCS. Gas Products Divn. Petrocorp Ltd. Hawera. (Plant Chemist).

Shore, Gwendoline Mary, NZCS (Biol). Pacific Pharmaceuticals Ltd. Auckland. (Technical Manager for Q.A.).

Graduate Members:

Duxbury, Mark, MSc (Auck). Medical School, Greenlane Hospital, Auckland. (Biochemistry Technician).

Thomas, Frank Neville, BSc (Hons) (Cantuar). 4 Castor St. Nelson.

Wheatcroft, Annette Joy, NZCS BSc. Te Puke High School, Te Puke (School Teacher).

Graduates from Student:

Fleming, Fraser Fergusson, BSc (Hons) (Massey). University of British Columbia, Canada. (Graduate Student).

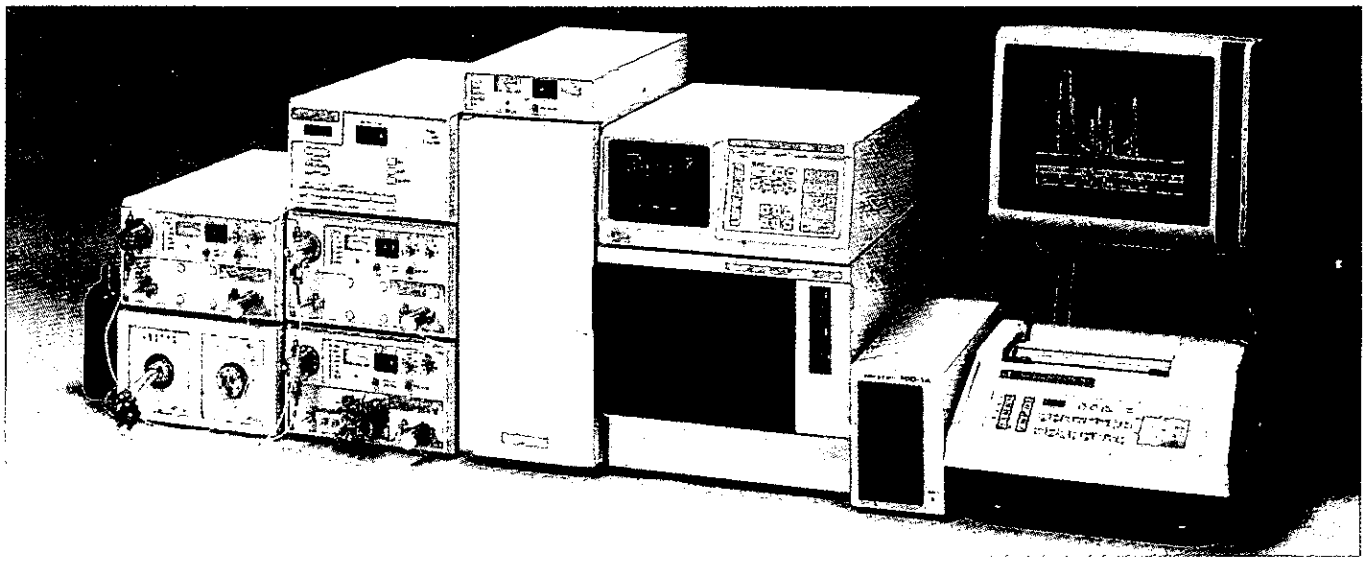
Lewis, Stephen John, BSc (Hons) (Cantuar). Chemistry Dept. University of Canterbury. (PhD Student).

Simpson, Richard William, BSc (Hons) (Cantuar). Chemistry Dept. University of Canterbury. (PhD Student).

Resignations:

H.V. Brewerton, D. Holey, M.R. Thomas (Wellington),
M. H. Lee (Overseas), R D Smith (Auckland).

Shimadzu



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BRANCH NEWS

Visit of Professor Walt Jennings

Visits to three of the branches were made in February by **Professor Walt Jennings** of the University of California, Davis. Professor Jennings, who described himself as the 'J' of J & W Scientific, spoke on practical aspects of capillary GC.

All three meetings were very well attended, with some people reportedly travelling significant distances from outside the branches to attend.

Professor Jennings' address was highly informative, but at the same time entertaining, being liberally peppered with anecdotes to emphasise his views. His pragmatic approach and advice on the solving of various analytical problems and column handling, were appreciated by all present.

Professor Jennings' visit was organised in conjunction with Sci-Med (NZ) Ltd, and the Chromatography specialist group of the NZIC.

Canterbury

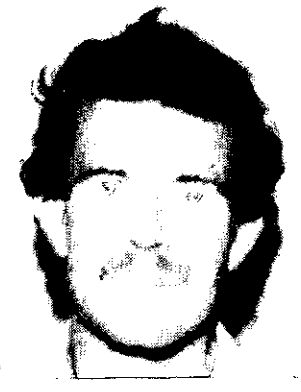
1987 Branch Chairman — S.G. Maister

Selwyn Maister completed his BSc and MSc at the University of Canterbury in the 1960's before proceeding on to a DPhil at Oxford University on a Rhodes Scholarship in the early 1970's.

His research at Oxford was on the mechanism of action of some glycolytic enzymes and it was here that his continuing interest in biochemistry was established. Since returning to New Zealand, Selwyn has been on the staff of the Science and Computing Department at Christchurch Polytechnic and is currently one of the two Heads of this large Department.

He has spent leave periods in a British College of Further and Higher Education and back at the bench in the Chemistry Division of DSIR, as well as acquainting himself thoroughly with the chemistry going on in Christchurch.

Selwyn has many sporting interests, notably hockey, in



which he represented New Zealand for 15 years, including 3 Olympic Games. He now coaches a local team, takes a keen interest in sports medicine, tries to keep on top of a large garden and helps bring up 3 small children.

Other members of the Canterbury Branch committee this year are **Geoff Groves** (Chairman elect), **Drs Mike Gray** (Treasurer), **Bryce Williamson** (Secretary), **Murray Munro** (Immediate Past Chairman, Delegate) **Doug Rankin** (Branch Editor), **Rob Martyn** and **Messrs Chanel Dorrance** and **Stephen Lewis.**

For the first function of the year **Geoff Groves** organised a well attended industrial visit to a local electroplating works in Christchurch (Accord Electroplating Ltd) on February 16. The visit proved most interesting and gave most people a better appreciation of electroplating technology and its uses.

ANZAAS Congress, 1987

The 56th congress of the Australian and New Zealand Association for the Advancement of Science was held in Palmerston North during 26-30 January. Massey University was the principal host institution. The mornings were devoted to special interest group activities, with 17-23 concurrent sessions each period. Afternoons were taken up with the opening ceremony (on the Monday), congress symposia consisting of four concurrent sessions each (Tuesday to Thursday) and the closing symposium, entitled "Science and Society — The Reality", on the Friday. Special congress lectures on a variety of topics were also presented.

A special Chemistry Symposium was opened by **Dr Andrew Brodie** of the Department of Chemistry and Biochemistry, Massey University, who presented the Liversidge Lecture. In his lecture, "Poised for Action — Lactoferrin, the Iron-binding Protein from Human Milk", Dr Brodie showed how an integrated approach was most fruitful for this topic of research.

The following two plenary lectures were jointly sponsored by the NZIC. The first was given by **Dr Mary Good**, the 1987 President of the American Chemical Society. Dr Good is currently President of Engineered Materials Research for the Allied-Signal Company in the USA (an $US11 billion per-year enterprise) and also President/Director of the Signal Research Center in Des Plaines, Illinois. She took up her present position in industry in 1980 after a number of years in the Louisiana University system, both in New Orleans and at Baton Rouge. Her stimulating lecture, "Materials by Design", gave a fascinating insight into possible future directions for the chemical industry. Dr Good was the guest of honour at the Institute's buffet luncheon, held immediately following her lecture.

Professor John Cadogan, Research Director of BP, London, entertained his audience with a talk entitled "Profitable and Pleasurable' Aspects of an Oil Giants Research". Professor Cadogan is a former President of the Royal Society of Chemistry (UK) and was a guest speaker at the Institute's Jubilee Conference in Auckland in 1981. His 1987 lecture was given in the Royal Institution, London, and was relayed live to New Zealand via a two-way satellite link by courtesy of BP, the BBC and TVNZ. The two-way link was the first of its kind to be made to New Zealand, being received here at 1.00pm and transmitted from England at midnight.

Another symposium entitled "Energy" followed the chemistry symposium. **Dr Julie Palmer** (Petrocorp NZ) opened the discussion with a paper entitled "Oil Exploration in NZ", which was followed by **Professor A.G. Williamson's** (University Canterbury) paper on the "Application of Solar Energy to NZ". **Professor Brian H. Robinson** (Otago University) completed this most interesting series of lectures with his presentation entitled "Chemicals from Lignite".

The Manawatu Branch of the Institute sponsored a lecture by **Ms Glynn Lorrigan** of Auckland Metropolitan College entitled "Science for Everyone". Ms Lorrigan commented on the lack of young women in senior school chemistry and physics classes and the limitation of career prospects for those people without a sound scientific background. She discussed changes that need to be made to courses to make them of greater interest to young people. A lively discussion period followed this well-attended lecture.

Two sessions were devoted to Food Irradiation, a topic of current interest and importance because of its imminent introduction to New Zealand. A facility with food irradiation capability may soon be built in Auckland, more irradiated foods may become available here and the use of all fumigation chemicals could be banned. The only foods that are currently treated by irradiation are some spices.

Dr Andrew McEwan (Director, National Radiation Laboratory, Christchurch) opened the first session with a discussion on the effects of irradiation on foods and the design and operation of an irradiation plant. **Mr Gordon Mitchell** (Queensland Food Research Laboratories, Brisbane) followed with a description of problems in the development of methods to establish whether or not a food has been irradiated, and to estimate the dose received. Methods of analysis currently available are each limited in applicability to a narrow range of foods.

The introduction of legislation on food irradiation, with emphasis on the situation in Australia, was discussed by **Dr Ron Ramm** of the Queensland Department of Health. **Dr Frank Peters** (Australian Federation of Consumer Organisations, Canberra) and **Ms Jan Taylor** (Queensland Consumer Affairs Bureau) followed with descriptions of concerns raised by various consumer groups. **Dr Bob Mann** (University of Auckland) and **Mr Bob Tait** (Friends of the Earth), in a joint paper, completed this session with a description of known and unresearched potentially harmful effects on food caused by gamma-irradiation.

Food irradiation on the New Zealand and international trade scenes were discussed by **Dr Peter Roberts** (Institute of Nuclear Sciences) to open the second session. The irradiation of horticultural products was then described by **Dr Neil Heather** (Department of Primary Industries, Queensland) and **Drs Alan Carpenter** and **Richard Baker** (MAF, Horticultural Research Centre, Levin and Lynfield Agricultural Centre, Auckland, respectively). Reasons for this treatment that were discussed included the disinfestation of insect pests, extension of the shelf life of the food and control of post-harvest diseases. However, chemical changes in the foods (fruit and meats especially) leading to loss of vitamins and softening, limits its uses. This session was completed with discussions on the installation of irradiators, both those using cobalt-60 (**Mr Jack O'Kane**, Coopers Animal Health (NZ) Ltd, Upper Hutt) and electron accelerators (**Mr John O'Neill**, Alphatech Systems, Auckland).

UNIVERSITY NEWS

Perspectives in Marine Natural Products

On Thursday, 12 February a one-day symposium entitled "Perspectives in marine Natural Products" was held in the Chemistry Department, University of Auckland. The symposium aimed to promote interest in marine natural products and followed a successful symposium "Chemistry and the Undersea World" held in 1982. The meeting was attended by over 50 participants who listened to a programme aimed to attract chemist, biologists, and allied research workers interested in interdisciplinary projects. Overseas speakers were **Professor John Coll**, **Dr Bruce Bowden**, each from James Cook University, **Dr Peter Murphy**, Sir George Fisher Centre for Tropical Marine Studies, **Dr Tim Moulton**, Western Biotechnology Ltd., Western Australia, and **Dr Shirley Pomponi**, Fort Pierce, Florida. In addition to talks by New Zealand speakers, including local zoologist **Professor Pat Bergquist**, a poster session was also held throughout the day. Convenor of the symposium was **Professor Con Cambie** of the Chemistry Department. A most interesting programme was completed by a "happy hour" during which the subject of **Mr John Croft's** last talk of the programme, the New Zealand green-lipped mussel, was heartily consumed and enjoyed by all.

Auckland

Dick Mathews has retired as Professor of Microbiology, in the Department of Cell Biology. Dick graduated from Auckland University College with BSc and MSc(hons) and took a position with the DSIR in 1941. He was then called up into the army, and saw active service in the Middle East and Italy. After the war he returned to his position with DSIR, where he remained until 1962. During this time he completed a PhD at Cambridge and spent a post doctoral year in Madison, Wisconsin. He also spent a period at the Molteno Institute at Cambridge.

In 1962 Dick was appointed to the Chair in Microbiology in the University of Auckland, and has been HOD for most of the time since. At the time of his appointment the department was sited with DSIR at Mt Albert, due to the shortage of space on campus. The move into the city took place in 1968, and at the same time the name of the department was changed to Cell Biology.

Dick's main research interest has been in the field of plant virology. This is the area in which he worked while at Cambridge, in collaboration with some of the founders of the subject. He has published regularly and prolifically in this field, and is also the author of a major textbook. In 1974 he was elected a Fellow of the Royal Society.

To mark his retirement, an International Conference on Plant Molecular Biology has been organised by the Department of Cell Biology. Dick has also been appointed Professor Emeritus.

Victoria

Professor Tomlinson has taken over responsibility as chairman of the Chemistry Department in place of **Professor Curtis.**

Dr Smedley has returned from leave, during which time he worked at SRI International, Memlo Park, California, with B.D. McDonald and M.C.H. McKubre. He was involved in studies of the dissolution mechanisms of aluminium in hot alkaline solutions, and the impedance characteristics of the sodium-sulfur cell.

Recent visitors to the Department of Chemistry have included **Dr Mok Kum Fun** (one of **Professor Duncan's** first PhD students at Victoria, and now lecturing at the University of Singapore), who described his recent work on proton induced x-ray fluorescence in chemical analysis.

Canterbury

The Changchun Institute of Applied Chemistry and the Chengdu Branch of Academia Sinica invited **Dr Ward Robinson** back to China, during our summer, to review one year of progress and give further instruction in experimental techniques for x-ray crystal structure analysis. Visits to the Institute of Materia Medica and the Institute of Technology in Beijing, as well as Beijing and Sichuan Universities, provided glimpses of large and determined research efforts in diverse areas of chemistry considered important to the Peoples Republic.

Otago

From the Chemistry Department; **Dr Chris Pope** is on sabbatical leave for 1987 working in **Professor Kemball's** laboratory at the University of Edinburgh. **Dr Keith Hunter**, **Malcolm Reid** and **Bill Ahlers** have recently attended the 4th Symposium of the International Association of Sediment-Water Science at Melbourne University.

Professor Bob Gagosian, Chairman of the Chemistry Department, Woods Hole Oceanographic Institute, is visiting Williams Evans Fellow until June. Professor Gagosian was in New Zealand in 1983 for the SEAREX experiments at Cape Reinga, and at Otago is interacting largely with Dr Keith Hunter's research group. He is interested in the transformations of 'tracer' organic compounds in oceanic processes

Recent visitors to the Department of Textiles have been **Professor Peter Lord**, Lineberger Professor of Textiles at North Carolina State University, Raleigh, and **Professor Dieter Hummel** of the Institute of Physical Chemistry, University of Cologne. The latter visitor gave a seminar on microcomputer-assisted identification of materials from digitised IR spectra libraries.

From the Biochemistry Dept; **Murray Grant**, a PhD student with Dr Kevin Farnden, was awarded an OECD Fellowship from the Co-operative Research Project on Food Production and Preservation to study the regulation of gene expression in developing root nodules. Murray left to work for 4 months with Dr D.P. Verma at the Centre for Plant Molecular Biology, McGill University.

Craig Marshall, an assistant lecturer in Biochemistry who is also a PhD student with Dr Warren Tate, has been awarded an MRC Young Investigators Travel Award to attend the Lorne Protein Chemistry Meeting in February and also to visit Professor R. Wottenhall's laboratory at La Trobe University.

Mike Eccles has completed his PhD with Dr Dick Wilkins and gone to Princeton on a Fogarty International Post Doctoral Fellowship. He will be working with Michael Cole in the Department of Molecular Biology and will study oncogenes.

Sue Galloway won an MRC Young Investigators Travel Award while completing her PhD with Dr John Cutfield and is now in the Department of Biochemistry, University of Wisconsin, Madison with Professor C Raetz. She is presently studying the synthesis of Lipid A (Gram-negative endotoxin cell-surface lipiprotein) through the use of E.coli mutants, but will be moving to the use of animal cell mutants to study phosphoinositide metabolism.

Lajwant Romana, who has been working with glucanases from Candida albicans with Associate Professor Pat Sullivan has gained her PhD. She is now in the University of Regensburg, West Germany with Professor Widmar Turner investigating the role of glycoproteins in the yeast cell cycle.

Berthold Kastner from the Max Planck Institute, Berlin who had been working in Warren Tate's laboratory for more than a year returned home recently. His farewell "seminar" demonstrated that he was also a first-class photographer with a fine appreciation of the countryside.

And it is not only graduates who have been taking wing. Four members of the teaching staff of the Biochemistry Department will be on sabbatical leave in 1987. **Murray Grigor** has gone to the Hannah Research Institute in Ayr, Scotland; **Janey Carrington** is leaving for Oxford; **Ian Forrester** to the University of Wisconsin, Madison, USA and **Clive Trotman** To the University of Antwerp, Belgium.

But we are pleased to welcome one new face and one 'old' face in a new guise. **Bryan Williams**, an Otago PhD in microbiology from 1976 is now an Associate Professor in the Department of Medical Genetics, University of Toronto where he is based in the Division of Infectious Diseases at the Hospital for Sick Children. Bryan is presently spending his sabbatical leave in the Biochemistry Department with Tony Reeve and Dick Wilkins. His visit has been supported by the NZ Cancer Society.

Alan Carne, who came to the Biochemistry Department in 1982 as a Research Officer with Professor George Petersen has recently been appointed Lecturer in Biochemistry.

Industrial News

There have been several staff changes at Cadbury Schweppes Hudson in Dunedin. **John Booth**, who was working as a chemist has moved into a supervisory position in the factory. His place in the laboratory has been taken by **Kevin Palmer** who had previously worked for the Dairy Board and Dairy Research Institute as well as Shell/BP Todd at the Maui Gas Field. **Rob Sherriff** left Cadbury Schweppes Hudson to take up a position as Scientific Officer in the Department of Experimental Medicine at the Wellcome Institute.

GOVT DEPTS & RESEARCH INSTITUTES

DSIR, Applied Biochemistry Division

Dr Keith Joblin recently returned from Tokyo after working for 12 months on the Horikoshi "Superbugs" Project organised by the Research Corporation of Japan. On his way home, Dr Joblin spent a month visiting researchers in the U.K., including Dr Alan Williams (Hannah Research Institute), Dr Andrew Chesson (Rowett Research Institute), Dr Bill Grant (Leicester University) and Dr Christine Kennedy (Sussex University).

In January, **Dr Daryl Rowan** returned from a year's study leave at Professor Peter Albersheim's Complex Carbohydrate Research Center at the University of Georgia in Athens. Dr Rowan spent the year investigating elicitors of phytoalexin (antibiotic) production in soybean, "learning" NMR and visiting research groups in the eastern USA involved in the chemistry of plant-insect interactions. He considers the highlights of his stay in Georgia were the heat (40°+) and canoe-camping with the alligators of the Okeefenokee Swamp.

Dr Bill Kelly has returned from England, where he spent 3 months on an OECD Fellowship at the AFRC Institute for Animal Physiology and Genetics Research at Brabraham, seven miles south of Cambridge. Prior to that, Dr Kelly attended the IUMS Microbe 86 meeting in Manchester and the Genetics of Industrial Microorganisms Symposium in Split, Yugoslavia. In an account of his travels, reported in the Divisional Bulletin, Dr Kelly said, "It was the wrong time to arrive at Brabraham! The Department had run out of money, the work I intended to do was not possible, and four members of the department had been told they were compulsorily redundant. The morale and atmosphere were very bad but gradually improved over the next three months, and some useful work was accomplished. However, the people there have to live with the uncertainty over their jobs and this is very stressful. Chances of re-employment in science are virtually nil." Maybe this is a portent of a situation about to develop in New Zealand?

NZ Dairy Research Institute:

Recent resignations include; **Dr Hester R. Cooper** who joined a firm of market consultants in Auckland, **Mr Allen D. Marshall** who has joined a NZ Dairy Board Subsidiary Company in the USA, **Mr Steve A. Espie** (Casein Products) who has joined a Dairy Board Subsidiary Company in West Germany and **Dr Gerald M. O'Meara** who has joined the NZ Dairy Board. New Research Officer appointments include **Miss Jane C. Clark** (Effluent Technology), **Miss C. Julie Downard** (Milk Powders and Drying), **Miss Pip J. Lamont** (Product Use and Evaluation), **Ms Tania Oolders** (Effluent Technology), **Mr Gerhard K. Hoppe** (Whey Products), **Mr Patrick W.M. Janssen** (Engineering Services) and **Mr J. Ralph Olerenshaw** (Engineering Services).

DSIR, Chemistry Division — Gracefield

Max Robertson (Government Analyst — Christchurch) has now taken over additional responsibilities of Group Manager for the Health Department activities of the Division following the retirement of Hugh Brewerton.

Helen Beaumont (Head of the Environmental Chemistry Section) attended a conference on trace metals in sediments and waters in Australia in February.

Recent staff appointments were **Rick Berezowski** to Spectroscopy and **Sarah Parker** to Applied Chemistry.

DSIR, Chemistry Division — Christchurch

Mr Alistair Sheat from Synthetic Fuels Corporation will be joining the Water Section on 2 March.

Wheat Research Institute, Christchurch

Mr Peter Cressey has two years special leave from April 1987 for overseas travel.

Coal Research Association

Vince Gray is retiring from the Coal Research Association at the end of March 1987. He has been Chief Chemist for the past nine years and was previously with the Forensic Section of Chemistry Division, DSIR, and before that Director of the Building Research Association. For the next two years he will be Visiting Professor at the Institute of Energy Engineering, Zhejiang University, Hangzhou, Peoples Republic of China.

New Honary Fellows Elected

At its February meeting in Wellington, Council elected two new Honorary Fellows of the NZIC, namely Ken Seal of Auckland and Professor R. M. Barrer of London.

Prior to his retirement, **Ken Seal, CBE**, was General Manager, Technical Services for Ceramco Ltd, and Manager of the Geothermal Aid Project to Indonesia for Geothermal Energy NZ Ltd. Born and educated in London, Ken came to New Zealand in 1952 and joined the staff of Amalgamated Brick and Pipe Company Ltd, the forerunner of Ceramco. Ken also joined the NZIC in 1952 and after serving on the branch committee for a number of years, was Auckland Branch Chairman in 1966-67, and President in 1972.

Ken has given considerable service on a number of Government committees. He was a member of the National Research Advisory Council for a number of years, and also of its predecessor, the Council of the DSIR. He served on the Mineral Resources Committee, including a term as Chairman, was a member of the Clean Air Council, and also represented his company on the management committee of the Pottery and Ceramics Research Association. He was awarded the CBE in 1977.

Prof. R M Barrer, FRS, was born in Wellington in 1910 and educated at Wairarapa College and Canterbury University. He was an 1851 Exhibition Scholar and completed his doctorate at Cambridge. One of his many activities was a keen interest in long distance running and he won many awards. But it was in England that he was able to pursue his academic interests in surface chemistry and adsorption. He had several university posts before accepting the chair of Physical Chemistry at Imperial College London, which gave him the opportunity of carrying out the work for which he is most famous — that of the chemistry of zeolites and molecular sieves. He was elected a Fellow of the Royal Society in 1956 and FRSNZ in 1965. A pioneer in his field he took out a number of the first patents on molecular sieves and discovered how to form acid zeolites, which have extensive uses as catalysts in the modern petrochemical industry.

Assessment and Control of Major Accident Hazards in Industry

The NZIC Hazardous Chemical Committee made the following comments, on the above document (refer Council News).

1) We believe that Hazardous Substances Technical Liaison Committees which have representatives from many Government departments, as well as Emergency Services Agencies, should play an integral role in the Hazard Assessment procedure as these committees are ideally suited to do this.

2) We believe that potentially hazardous operations should include transport.

3) The requirements should bind state sector activities as well as private.

4) Threshold values are of limited value because the quantity which is dangerous may vary greatly, e.g. a small quantity may be a potent environmental contaminant or interactions of chemicals may produce highly toxic or environmental contaminants.

5) Besides constraints on construction, commissioning and operation of plants, their closure also needs to be regulated.

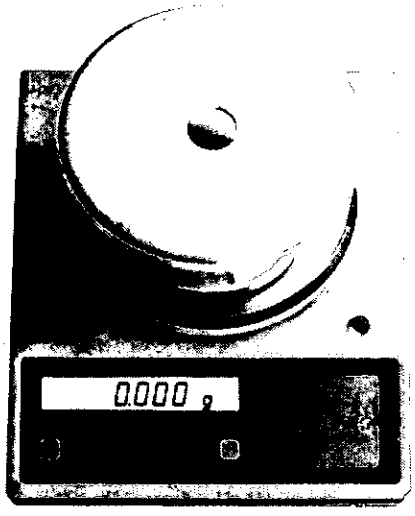
6) Any new regulations should embrace the requirements of the Water and Soil Act and regulations as well as local body regulations:

7) In considering effects of an accident on the environment the importance of drains, sewers and water courses should not be overlooked.

8) Training in hazard assessment and in managing hazardous systems, which is just as important as requirements in controlling the activities, needs to be properly carried out. This must start with the inspectorate and be available to designers, constructors and operations managers through whom all staff can be taught the correct procedures for safe operation of the processes and for coping with emergencies which may arise. Nominated responsible persons should have deputies and information on such people and other contacts must be regularly updated.

9) Finally, we believe that government must support the programme with a long-term commitment which is not subject to withdrawal in times of economic stringency.

CLEARLY BETTER BALANCES



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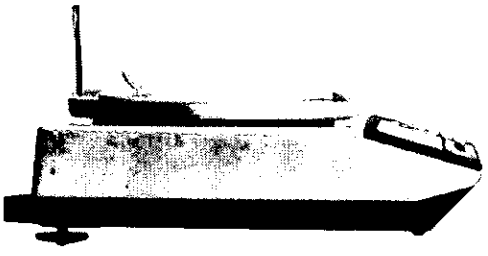

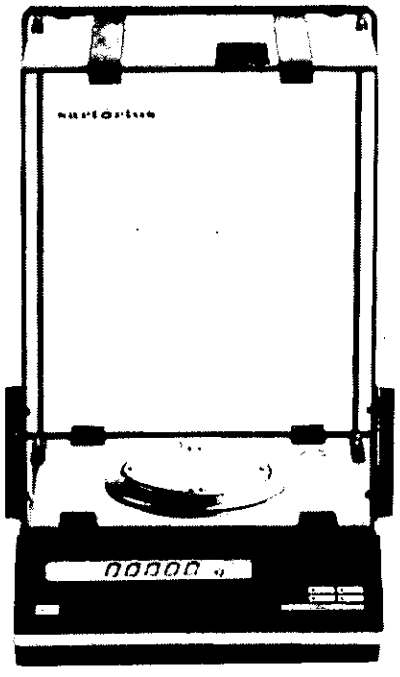

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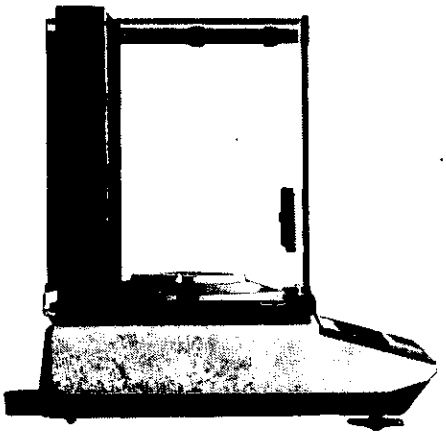

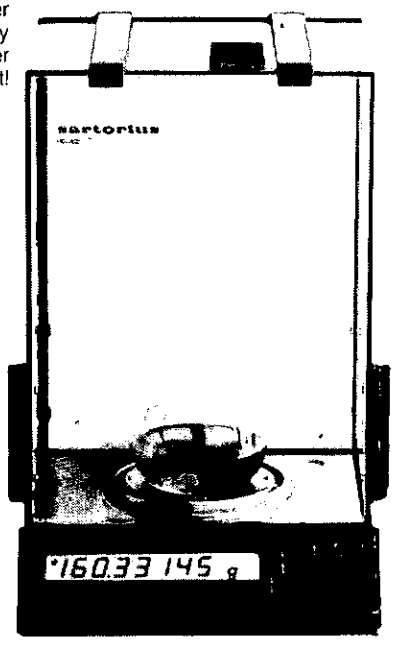

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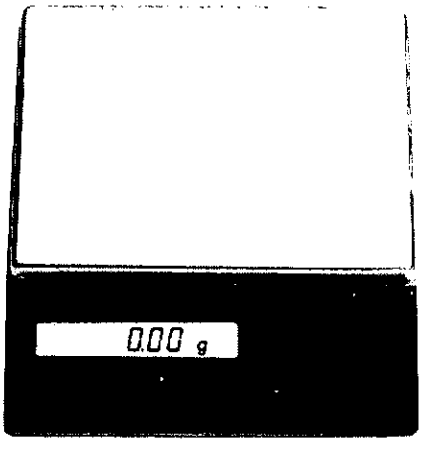

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BOOK REVIEWS

FORMALDEHYDE RELEASE FROM WOOD PRODUCTS
Eds. B. Meyer, B.A. Kottes Andrews and R.M. Reinhardt. American Chemical Society Symposium Series No. 316. Washington D.C., 1986, 240pp. US $59-95.

Formaldehyde emissions from a variety of manufactured products have received considerable attention over the last decade. Environmental, consumer and regulatory authorities, particularly those in the USA and N. Europe, have been concerned about the obvious irritant nature of formaldehyde and, more importantly, its suspected carcinogenicity. This concern, coupled with the widespread use of formaldehyde emitting products in dwellings, has resulted in vast amounts of published literature on the subject.

Although the report of the US National Cancer Institute in April 1986 has firmly come to the conclusion that there is no evidence that formaldehyde is a human carcinogen, there is still concern over formaldehyde emissions on general health and environmental grounds.

Based on an American Chemical Society Symposium in May 1985, "Formaldehyde Release from Wood Products" aims to provide a relatively recent summary of the many aspects of formaldehyde release from wood products.

The first chapter of the book is an overview of formaldehyde use in industry and of the chemistry, test methodology, toxic effects and reduction of formaldehyde emissions. The next three chapters discuss formaldehyde emissions from particleboard, MDF and plywood. In chapters 5-8, authors describe chemical reactions of formaldehyde with cellulose and wood components. Chapters 9 and 10 present new methods of analysis of formaldehyde concentration and release. Chapters 11-14 detail the measurement of formaldehyde release from bonded wood products and the correlation between laboratory test results and real-life emissions. The next two chapters describe methods of reduction of formaldehyde release. Finally, chapters 17 and 18 discuss positive and negative aspects of emission regulations and guidelines.

"Formaldehyde Release from Wood Products" is recommended for anyone needing technical information on formaldehyde emissions from wood-based products. The review articles are supported by very adequate references to the original literature so that those people needing access to very specific information on the topic are well catered for. Equally the non-chemist requiring a ready reference source for background information will find the book of value. The book is recommended for the shelves of those technical libraries that are required to service enquiries about formaldehyde and its toxicity.

R. Maylor
Technical Manager,
A.C. Hatrick (NZ) Limited.

REAGENT CHEMICALS, SEVENTH EDITION 1986 AMERICAN CHEMICAL SOCIETY SPECIFICATIONS.
ACS, Washington D.C., 1986
U.S. $107.95

Commercially available reagent chemicals normally contain traces of various contaminants arising from the manufacturing process. However in analytical chemistry in particular it is important to keep these extraneous substances within very specific limits. A recent chemical catalogue from the United States lists many chemicals with several grades of purity and some are listed as "meets ACS specifications". The American Chemical Society Committee on Analytical Reagents is charged with the task of preparing specifications for a range of chemicals used, in particular, in analytical chemistry. The Seventh Edition of their publication "Analytical Reagents" contains specifications effective from 1/1/87 for over 350 common reagents. The ACS specifications are normally based on the highest level of purity of the reagent which is available on the competitive market in the United States, i.e. it should be available at this quality from more than one manufacturer. The specifications give a maxima for various listed impurities. Of course the actual purity may be very much greater than this and when chemicals of higher purity are readily available the specification is amended accordingly. Although these listed reagents are of good "analytical" quality, chemicals of more rigorous specification may be required from time to time for special tests. Details of the tests which may be used to check that a particular reagent meets detailed specifications are given as well as general directions and procedures and methods for the preparation of reagent solutions used in the tests.

The manufacturers obviously take note of these specifications when packaging reagent chemicals for laboratory use but what is there in this book for the analytical chemist working at the bench? It provides a list of chemicals which are available to within a specific stated purity and it sets out detailed instructions on how to check the purity of a reagent to ensure that it meets their recommended specifications. However it is not the book which the practicing chemist will refer to very frequently. On my bookshelf it will be placed beside "Analar" Standards for Laboratory Chemicals which is well known to those who purchase chemicals from United Kingdom sources.

A D Campbell,
University of Otago

The Thesaurus of Chemical Products, 2 Volumes, Edited by Michael and Irene Ash, Edward Arnold, London, 1986, £95.00

Volume I lists generic names in alphabetical order with their trade names and Volume II gives the converse. Over 50,000 trade names are listed, each with its manufacturer whose address is given in the appendix.

There are nearly a thousand manufacturers listed but 85 Israel, India, Taiwan, Japan and South America account for only 15 percent. Perhaps a future edition will acknowledge the increasingly significant chemical industries in Korea and Mainland China as well.

The jacket blurb's claim that the book "gives a rapid and convenient way of locating all of the chemically equivalent products that are available" is of course an exaggeration but, in spite of some notable gaps, the authors have compiled a very useful reference.

Omissions, which are in trade names and manufacturers, include the following:

Although the entry "Silica" lists several well-known brands of fumed silica only one of them is listed under their more specific heading "Silica-Fumed".

A similar anomaly is the fact that Degussa corp NJ USA is included but not its parent, Degussa Germany.

The volumes are strongly bound and clearly printed on substantial paper as is appropriate for books which are used often.

In spite of some gaps these books will be invaluable to anyone concerned with identification, procurement or substitution of industrial raw materials.

R.H. Hopgood

HAZCHEM Labelling Code From NZCIC

The NZ Chemical Industry Council has recently released a Code of Practice on *Warning Signs for Premises Storing Hazardous Substances.* Based on the HAZCHEM system, the document provides guidelines for labelling of premises to ensure that in the event of fires or other incidents, emergency services personnel will have sufficient information to respond in the appropriate way.

The publication gives specifications for the HAZCHEM labels and procedures for deriving the correct label for any location. A tabulation of HAZCHEM codes is also provided for an extensive list of chemicals.

Copies of the Code are available from NZCIC, P.O. Box 27-189, Wellington (cost $20).

NOTICE

Hazard Workshop on Fires and Explosions, Auckland, 25 May 1987

This workshop is one of a series being organised by Hazard Analysis Limited, of Wellington. The course leader will be Dr A.A. Evans who has been involved in hazard assessment since 1976.

Most of the material used in the workshop has been prepared by The Institution of Chemical Engineers, U.K. Based around studies of actual case histories, course participants will research and analyse each incident, and prepare recommendations which will then be compared with those actually carried out. The case histories studied will range from a fire in a bucket to the collapse of a large LPG tank. Both fatal and non-fatal accidents will be included. A degree of technical knowledge will be required for the analysis of some of the cases.

The fee for the course will be $120 (including GST), and course numbers will be limited to 20 people. For information on this, and other related courses, contact:
Hazard Analysis Limited, 8 Silverstream Road, Crofton Downs, Wellington 4. (Ph: 791-388).

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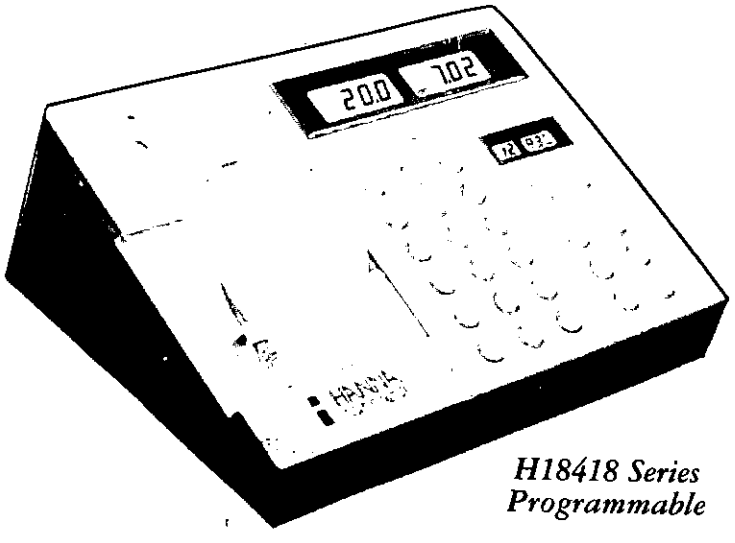

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For further information please circle no. 40 on reader reply card.

Cover Story

Putting the Finger on Pollution with PU 9500 and PU 9700 IR Spectrophotometers

Although you can't see them under a magnifying glass, chemical fingerprints can be as revealing as those left on a murder weapon. For the scientist investigating environmental pollution, the scene of the crime is often an estuary or seaway.

Deliberate spillages of oil from tankers pose a threat to marine life, and can destroy the spawning grounds of many fish. Tracking down those responsible is not an easy task, but with the aid of infrared spectroscopy the culprits can often be brought to book. Since crude oils from around the world vary in their chemical composition, they can be distinguished by their spectra. In the case of a mystery oil spillage, allegations can be made when the spectra of samples from the slick and suspected source match.

Using infrared spectroscopy, scientists can study pollution of land and air as well as sea. Applications range from the determination of herbicides and pesticides in foodstuffs to the monitoring of noxious gases in exhaust fumes.

Miners and steelworkers are only too aware of the dangers of asbestos and silica dust. Infrared analysis is equally applicable to heavy industry, where it is used to test for hazardous airborne particles.

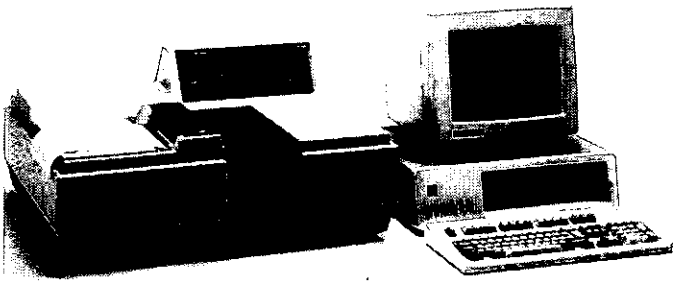
Philips New Zealand has recently introduced two ranges of infrared spectrophotometers with a number of advantages for the environmental detective.

The PU 9700 range offers a choice of low cost, microprocessor-based ratio-recording spectrophotometers which can be linked to the new Philips Analytical Data Station to provide powerful data manipulation and storage, in high resolution colour, if required.

An ability to store spectra to disk is one outstanding feature of the new PU 9550 spectrophotometers. Achieved by means of an IBM PCXT environment personal computer, it gives access to an impressive range of business software as well as fulfilling high level IR requirements in full colour or monochrome.

The new disk-based software is driven by a user interface which is particularly easy to operate. Such features as these, coupled with excellent analytical performance, mean that the PU 9550 range now sets the standard for medium-priced IR spectrophotometers.

The storage on disk ability enables on-screen comparisons to be made between the "fingerprints" of known and unknown substances. Both Philips' PU 9550 and PU 9700 Series can offer the capability of spectral subtraction, which is particularly useful when samples for analysis have to be collected on materials which themselves have an infrared "fingerprint". Subtraction of the spectrum of the collector (usually an air filter) from the composite leaves a spectrum particular to the substance in question.



PU9700 IR spectrophotometer, linked with an IBM PCXT Computer provides powerful data manipulation and storage

Philips' Analytical IR data systems benefit from 'pop-up' softkeys which facilitate rapid and versatile operation. A combination of Help information, operator prompts, audio visual warnings, error messages and built-in software manual enables any user, irrespective of skill level, to obtain accurate, precise analytical data with speed and confidence.

Each system achieves the best performance in its price class, combined with speed, simplicity and reliability — features which make the instruments particularly suitable for quality control and teaching applications.

Users can also take advantage of Philips' uniquely flexible IR Library Search software enabling comparison of unknown spectra against the Philips IR libraries package, which covers a wide variety of applications.

For further information please circle no. 10 on reader reply card.

PRODUCT NEWS

Starna Spectrophotometer Cells

All STARNA cells, unless otherwise specifically requested, are manufactured using a "Fully-Fused" method. This technique pioneered by the skilled craftsmen who produce STARNA cells, ensures that the cell windows, which have been optically polished, are joined to the polished wall ends by the use of heat alone without optical or physical distortion of the windows.

There are no intermediate or adhesive materials used in the construction of "Fully-Fused" cells, therefore they are completely homogeneous and permanently resistant to all solutions other than those which attack the raw materials.

During the production process any strain in the cell is removed by careful annealing, and this, together with the "Fully-Fused" method of construction, allows the cells to withstand a reasonable amount of physical and thermal shock as well as ultrasonic vibration and pressure differentials of up to 2-3 atmospheres. With care, the cells may be used at high and low temperatures.

Matching

The high degree of accuracy maintained during STARNA production ensures that the physical tolerances on path lengths are well within the accepted standard of 0.01mm therefore the main differences in transmission between new cells may be attributed to variation in the raw materials from one batch to another.

After production, the transmission of every cell is measured. Cells with identical transmission values are allocated the same match code and it is therefore possible to order large quantities of cells with identical transmission values. Replacement cells can usually be supplied with the same match codes but because of the differences in raw material it is not always possible to carry all match codes in stock. It must be emphasised that the use of cells slowly changes their transmission value and it cannot be assumed that a new cell will exactly match a used cell of the same match code.

Window Materials

It is possible that a number of different materials may be suitable for any given application. Where this situation occurs it would seem reasonable to choose the least expensive material bearing in mind future possible needs. The following information is a guide to the practical usable range covered by each material:

Optical Glass — Suitable for use from 350nm through to 2500nm.

Special Optical Glass — Suitable for use from 320nm through to 2600nm.

Herasil (Near UV Silica) — Slightly less expensive quartz material suitable for use between 220nm and 2700nm. Not generally recommended for fluorescence work.

Spectrosil or Suprasil (Far UV Silica) — Suitable for use between 170nm and 2600nm. They show no fluorescence but do have a strong absorption band at 2700nm.

Infrasil (IR Silica) — This material has no significant absorption band in the UV and is useful from 220nm through to approximately 4000nm.

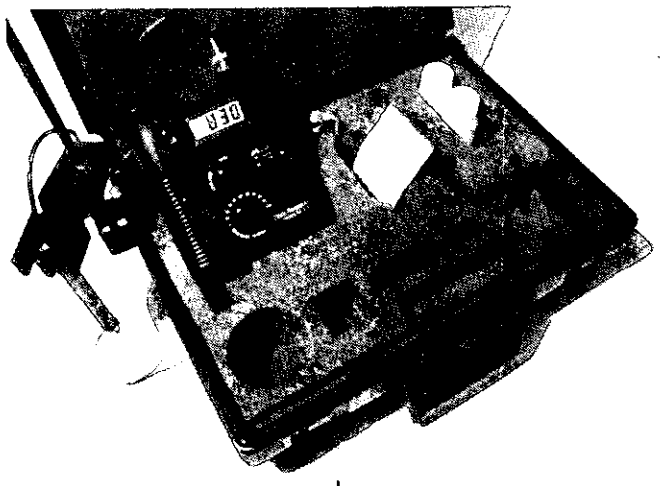
Packing

All cells are wrapped in acid free tissue paper. Except for cells with awkward shapes, they are then put into small cardboard covers and placed in polystyrene boxes which hold up to four 10mm cells per box. There is no charge for this service which ensures that the cells are received in perfect condition. Velvet lined storage cases can be supplied for most of the cells in the catalogue and are available at a reduced rate when purchased with cells.

Starna spectrophotometer cells are available from Kemphorne Medical Supplies Ltd.

For further information please circle no. 11 on reader reply card.

pH PRODUCT FEATURE



Versatile pH Meters

Orion Research Incorporated introduces two new meters for pH, DO/BOD, and redox potential measurements in the lab or field. The meters, SA210 and SA 230, have measuring ranges of 0-14 pH and + 1999 to -1999 mV.

The SA 210 is a pH/mV meter. The SA 230 is a pH/temperature/mV meter with ATC probe for automatic temperature compensation.

Both meters come with a rugged carrying case, all the essentials needed for measuring pH, and a special electrode holder that attaches to the carrying case, allowing the meter to remain in the case during measurements.

The meters are lightweight and have a ribbed design for a firm one-handed grip. The control knobs are recessed to prevent accidental bumps changing settings. The durable meter housing is corrosion resistant.

The knobs and switches are sealed to withstand dust and spills.

Battery life is approximately 100-150 hours, continuous use. An optional AC line adapter is available.

Other accessories include: a holder with neck strap, for hands-free operation, that converts into a sturdy stand for flat surfaces, like a bench top, tail gate or flat rock; and a heavy base electrode stand that is hard to tip over in bench top use.

DO/BOD measurements can be made on either meter with an ORION oxygen electrode. Redox potential measurements can be made with ORION redox electrodes.

Orion Research Incorporated are represented in New Zealand by Watson Victor Ltd.

For further information please circle no. 2 on reader reply card.

Performance pH

The Hanna Instruments range offer the ideal solution for use in laboratories where pH, specific ions and ORP measurements are required. Thanks to a low consumption microprocessor these instruments are also battery operable. With this feature the HI8521 and HI8520 are particularly suitable for quality control tests in locations where electricity is not commonly available.

A highly advanced software recognises the memorised pH buffers, (pH 4, 7 and 10) during calibration. This calibration data is memorised for at least 6 months even when the instrument is turned off.

By pressing the range key the display is automatically converted from pH to mV or °C.

It is possible to measure mV values from -400 to +400mV with a resolution of 0.1 mV. Temperature is measured with an accuracy of 0.4°C. in the °C mode.

The unit is simple to use, pH calibration being performed using just two keys. Temperature compensation of pH may be automatic or manual by pressing the appropriate keys. The keyboard also accomodates a table of error symbols and a pH/°C buffer chart for the calibration procedure. There are no protruding switches to be knocked and thus change the settings on the unit. You would expect to pay over a thousand dollars for this type of technology. Give us a ring at Alphatech Systems for a very pleasant surprise.

For further information please circle no. 1 on reader reply card.

New Generation Soft Key Pad — Crison pH Meters

Crison have introduced a range of new generation 2000 Series microprocessor controlled, soft key pad pH Meters. The total Crison range include both a standard type portable Model 506 pH Meter and the new Bench Top Micro pH 2000 Series pH Meters.

A common problem found with traditional function keys is the accidental spilling of corrosive liquids and leaking of gases into the internal circuitry of the pH Meter causing expensive damage. With the flat spill-resistant soft key pad this problem is eliminated.

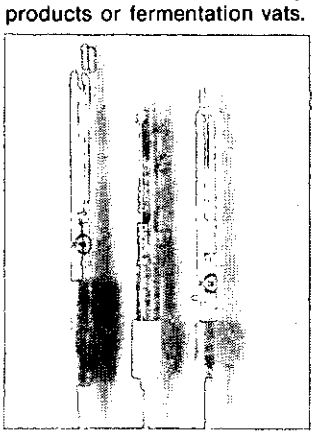
The Crison 2000 Series pH Meters incorporate a microprocessor key pad with self explanatory functions for classic simplicity. With only a few operating steps, the meters require no specialised knowledge of operation. In addition, the meters feature temperature compensation and are available with different levels of accuracy.

They come supplied complete with an electrode of your choice and buffers. In addition the portable Model 506 is supplied with a handy, robust carry case.

For further information please circle no. 3 on reader reply card.

Guide for Laboratory pH Electrodes

INGOLD offers a range of more than 100 electrodes. Their new Catalogue is intended to help you find the electrode best suited to *your* application. The synoptic table will almost certainly include the sample medium in which you are interested, whether it be effluent waters, soil, meat, cosmetics, dairy products or fermentation vats.



The following columns narrow down the choice to the appropriate pH ranges. This leads then directly to the most suitable electrode types, which in turn are illustrated on the succeeding pages with all technical data.

The new INGOLD catalogue not only facilitates the choice of electrodes, but also gives important information about buffer and cleaning solutions, plugs, sockets and connecting cables, as well as a list of INGOLD brochures explaining everything about the theory and problems of pH measurement.

For further information please circle no. 5 on reader reply card.

XEROLYT®: the pH Measuring System That Solves Many Problems

In XEROLYT® electrodes the reference-electrolyte chamber is completely filled with a pressure-resistant electrolyte. This has enabled the use of a ceramic diaphragm to be eliminated, so that the electrolyte and the sample medium are in direct contact via an "aperture diaphragm". Thus all problems of diaphragm contamination are virtually eliminated, placing this system way out ahead of all previous gel or paste electrodes as regards range of application, freedom from interference and working life.

The XEROLYT® gel contains AgCl, so that no blockages due to sparingly soluble silver compounds can occur. This ensures a high degree of measuring accuracy and good long-term stability.

Since the electrolyte does not require topping up, and its pressure-withstanding properties enable the electrode to be used in simple industrial probes without pressure compensation, the new reference system is economical and largely maintenance-free. These special characteriestics make the system suitable for use in the following media:

— Heavily contaminated solutions
— Emulsions and suspensions
— Effluent waters
— Media containing proteins
— Hot alkalies (together with Type HA pH glass)
— Measuring loops with wide pressure fluctuations.

The new INGOLD InTrac® 777 retractable probe has been specially designed for industrial pH and redox measurements with XEROLYT® electrodes. With this probe, electrodes may be serviced, calibrated or exchanged without the need for interrupting the process.

XEROLYT® is a registered trademark of Dr W. Ingold AG, who are represented in New Zealand by John Morris Scientific Ltd.

For further information please circle no. 6 on reader reply card.

pH PRODUCT FEATURE

Beckman Releases New pH Meters

Beckman Instruments, Inc.'s new, portable pH meters include the simple pHI™ 10 pH Meter for water treatment, quality control and assurance, or food engineering application. The reliable meter is designed for durability in the industrial laboratory or field environment.

The hand-held pHI 10 operates on a long-life lithium battery, weighs 160 grams, and measures 8.6×15.8×3.5 cm. For easy viewing and resistance against spills and wear, Beckman designed the small meter with an angled face that is protected with a sealed overlay. Indicators for temperature, pH values, and measurement standards are visible at a glance; the tactile keys are raised.

The meter automatically recognises five standard buffers — 1.68, 4, 7, 10 and 12.45 — and enters temperature-corrected values for standardization or calibration. The pHI 10 Meter's Auto-Read™ feature computes stability of the electrode's measurement, then displays the reading as it approaches stability, and locks the display into place. The meter has a resolution selector of .1 or .01 for pH. An automatic temperature compensation (ATC) feature automatically corrects for actual temperature at time of measurement.

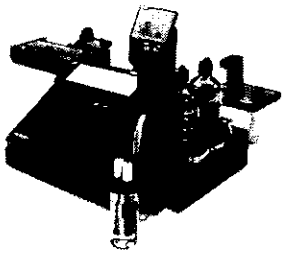
Optional accessories include a wall mount, and a startup kit with three sample buffers, one bottle filling solution, an electrode and cable. Beckman equipment is available through Alphatech.

For further information please circle no. 7 on reader reply card.

Automated ISE System

Orion Research Incorporated have recently introduced the ORION 960 Autochemistry System, designed to enhance and expand measurements by electrode.

The system consists of an ORION EA 940 pH/ISE meter and an Autochemistry Module.



The module contains an automatic dispenser, stirrer, electrode holder, reagent rack, and software for performing eleven analytical techniques. Five of the techniques are used to enhance electrode performance by making measurements faster and more reliable than current manual procedures. Typical examples include the measurement of sodium in food, potassium in wine, and low levels of fluoride.

Other techniques expand the number of analyses that can be made by electrode through both traditional and novel titration techniques. These measurements include sulfate in waters and phosphate. Additionally a "Help" function can be employed to suggest a specific technique and specific parameters such as reagent concentration and sample volume.

Operation of the system is controlled through "yes" and "no" buttons on the front panel of the EA 940 meter. Questions intended to lead the analyst through the procedures appear on the meter's 40-character display. Required numeric data such as sample volume, sample weight, and reagent concentration are entered from a keypad on the meter.

The dispenser is a rotary reciprocating pump. Because there are no valves, reagent can be replenished by refilling a reservoir. In addition, there is no dead volume, allowing reagents to be changed quickly.

The Autochemistry Module connects to one of the two electrode inputs on the back panel of the EA 940. Other electrodes can be connected to the other input so the the EA 940 can still be used as a stand-alone pH/ISE meter, even when the module is in use.

For further information please circle no. 8 on reader reply card.

Intermediate Junction Electrodes

Alphatech Systems are able to offer a new electrode that is specifically designed for use in messy samples such as Dairy Products, Meats, Foodstuffs, Industrial and Chemical products etc. Blockages at the reference junction in combination electrodes restricting the flow of electrolyte by this type of sample causes non reproducible results and a short electrode life.

Ionode Pty Ltd produces the 'IJ' series of electrodes consisting of upper and lower electrolyte chambers joined by a ceramic plug that does not interface with the sample. The lower chamber incorporates a slightly flexible plastic sleeve that fits over the glass probe and contains only a very small amount of electrolyte required to effect measurement. The sample being measured therefore does not come into contact with the electrode junction and removes the likelihood of the ceramic plug being blocked and subsequently restricting the electrolyte flow. The sleeve is readily removed to allow easy cleaning of the electrode.

The price is no more than standard bulb type electrodes.

For further information please circle 4 on reader reply card.

Radiometer PHM83

PHM83 AUTOCAL pH METER is a microprocessor-controlled pH, mV and temperature meter intended for easy routine measurements. Its outstanding technical design combines unique simplicity of calibration and advanced operator information to offer simple, quick and reliable measurements. The autocalibration of PHM83 includes automatic identification of buffer type and internal storage of temperature-corrected buffer values.

Ideal for

- Routine laboratory work
- pH measurements with manual or automatic temperature compensation
- mV measurements, absolute or relative, with Radiometer Redox Electrodes and Selectrodes®
- Temperature measurements

Radiometer are represented in New Zealand by Watson Victor Ltd.

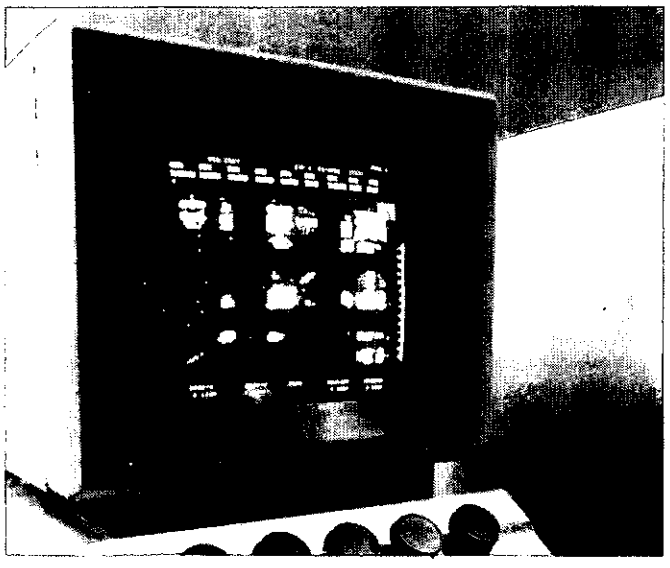
For further information please circle no. 9 on reader reply card.

1987 Yearbook: Corrections

Those readers whose names appeared in the 1987 List of Members after Smith, Sean Campbell will probably be aware that the normal rules of alphabeticisation appeared to have been replaced by the recipe for a dog's dinner! There is no sensible explanation for this cock-up; the answer possibly lies somewhere on the Art Department floor. To any of you who are inconvenienced by the disorder, we humbly apologise.

Two other errors should also be brought to your attention. We regret that the name of **Professor W R Roper** was omitted as the 1984 entry for the ICI prize. In addition there is an error on page 23 — the agent for **Mettler** top-pan balances should be shown as code 129 (**Watson Victor**), not 99.

More Product News



Varian Extends Cost-Effective FT NMR Spectrometer Family With Introduction Of Gemini 300 For Routine Industrial Applications

With the introduction of its Gemini 300 FT NMR Spectrometer, Varian is extending its line of competitively priced, easy-to-use instruments designed for routine proton and carbon experiments. Providing twice the resolution and performance of the Gemini 200 its companion instrument, the Gemini 300 rounds out a product family that now addresses nearly 80 percent of today's NMR experiment requirements with a low-priced instrument.

Designed for educational or high-production industrial environments, the compact Gemini 300 NMR spectrometer will find wide application in the basic chemical, food processing, petrochemical, pharmaceutical, medical research, and biochemical markets. It is ideal for organizations that have a limited budget for system procurement, want a second instrument to free the primary spectrometer for research activities, or need a specialized instrument rather than an expensive research instrument.

The Gemini 300 uses Varian's field-proven, cryogenic superconducting 7.1 T magnet system to observe protons at 300 MHz and carbon at 75 MHz. The standard system includes a 20-megabyte hard disk, four microprocessors including two 32/16-bit CPUs, and a color monitor.

Ease-of-use, productivity

Ease of use and productivity are key advantages of both the Gemini 200 and Gemini 300. Guidepath ™, a flexible, menu-driven user interface allows both experienced and novice operators to obtain expert results from complex NMR problems quickly and easily. Using GuidePath, the operator has the unique capability of customizing the system's operation. In the fully-automated mode, with a single key stroke, an operator can gather, process, display, and plot the entire NMR experiment. This significantly improves laboratory productivity. Less skilled technicians can run experiments, freeing the chemist for such tasks as data analysis and manipulation. In addition, the most common NMR experiments, such as HC APT and DEPT are fully automated.

For optimum operation and results, Varian's Autoshim™, Autophase™, and Autolock™ features automatically tune the magnet, thereby eliminating time-consuming manual operations. Other optional software packages, including Varian's MAGICAL™ high-level, macro-based NMR language are available as well.

Varian's optional ASM-100 sample management system can also be configured with the Gemini 300. This system, composed of a 100-sample capacity changer and sample management software, improves laboratory productivity by permitting unattended analysis of up to 100 samples.

The Varian Ethernet communications network afford Gemini systems access to the company's complete NMR networking strategy. In a networked environment, data can be transferred between any combination of Gemini spectrometers, VXR spectrometers, and DEC VAX computers.

For further information please circle no. 12 on reader reply card.

CONFERENCES

Coal Research Conference, Wellington, 2-4 November, 1987.

Coal Research Association plans to hold its second biennial Coal Research Conference in Wellington on November 2-4, 1987, following on from their highly successful inaugural conference in 1985, where there was an attendance of 200, with 105 papers delivered in three parallel sessions.

All aspects of coal science, coal resources, coal utilisation, and environmental issues, will be covered at this conference which should be of interest to members erence.
members of the NZIC.

The Conference Secretary. PO Box 3041, Wellington, would welcome an indication from members of their interest in attending, in presenting a paper, or simply in receiving further notices about the conference.

Certificate Course in Corrosion Technology

Industrial personnel are becoming more aware of the need for proper planning to avoid corrosion and deterioration of materials. The New Zealand Branch of the Australasian Corrosion Association Inc. are sponsoring two Certificate Courses, to be held in 1987, to assist with education in this important area. These part-time courses are to be held at:
Auckland Technical Institute (June — October, 1987)
Christchurch Polytechnic (April — November, 1987)

The courses will cover aspects of corrosion science, corrosion engineering and corrosion control, covered in two parts. The course is well recognised throughout Australia and New Zealand. There are no rigid entry requirements but students should have a sound knowledge of basic science and engineering principles.

Brochures and enrolment forms are available through the two course Convenors: Jim Lunan: Christchurch, Tel. (03) 798-150; Les Boulton: Auckland, Tel. (09)34-116, or write to ACA (NZ Branch) PO Box 5961, Auck-land. As the course involves a work-related project students must have the approval of their employer to attend. These courses are only offered in alternate years and the time invested will be well rewarded as you learn about the modern techniques to evaluate and control all the forms of corrosion of materials.

Oil & Colour Chemists Association, 25th Jubilee Convention, Rotorua, 22-26 July, 1987 — with the conference theme "Timber — its protection and decoration."

A wide range of speakers have been arranged, covering topics such as pigments, resins, adhesives, and biocides and fungicides, the manufacturing of these coatings and preservatives, through to the finished coatings and their performance. This diverse range of topics should appeal to both members and non-members of the Association.

Any persons or organisations interested in presenting a paper at this conference are invited to contact the organising committee. For this, and registration details, write to OCCA New Zealand Ltd, PO Box 5192, Auckland.

Biannual Conference of the New Zealand Geochemical Group, and, Annual Conference of the New Zealand Branch of the Australasian Institute of Mining and Metallurgy, Nelson 30 August — 4 September, 1987

The NZ Geochemical Group (NZGG) and Aus. IMM are holding their conferences in Nelson, back to back, on a joint theme of "Geology and geochemistry in exploration and research." Both conferences will individually cater for additional topics along their traditional lines. A tentative programme is as follows:

Sunday 30 August: NZGG evening registration.
Monday, Tuesday: NZGG papers and field trips.
Wednesday: Joint NZGG and Aus.IMM meeting on economic mineral deposits.
Thursday: Aus.Imm papers
Friday September 4: Aus. IMM papers till lunch. Depart on weekend field trip (tentatively looking at West Coast alluvial gold mining) after lunch.

Separate registration will be required for each conference, however, at this stage further information on both can be obtained from Dr A.B. Christie, NZ Geological Survey, PO Box 30-368, Lower Hutt.

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