

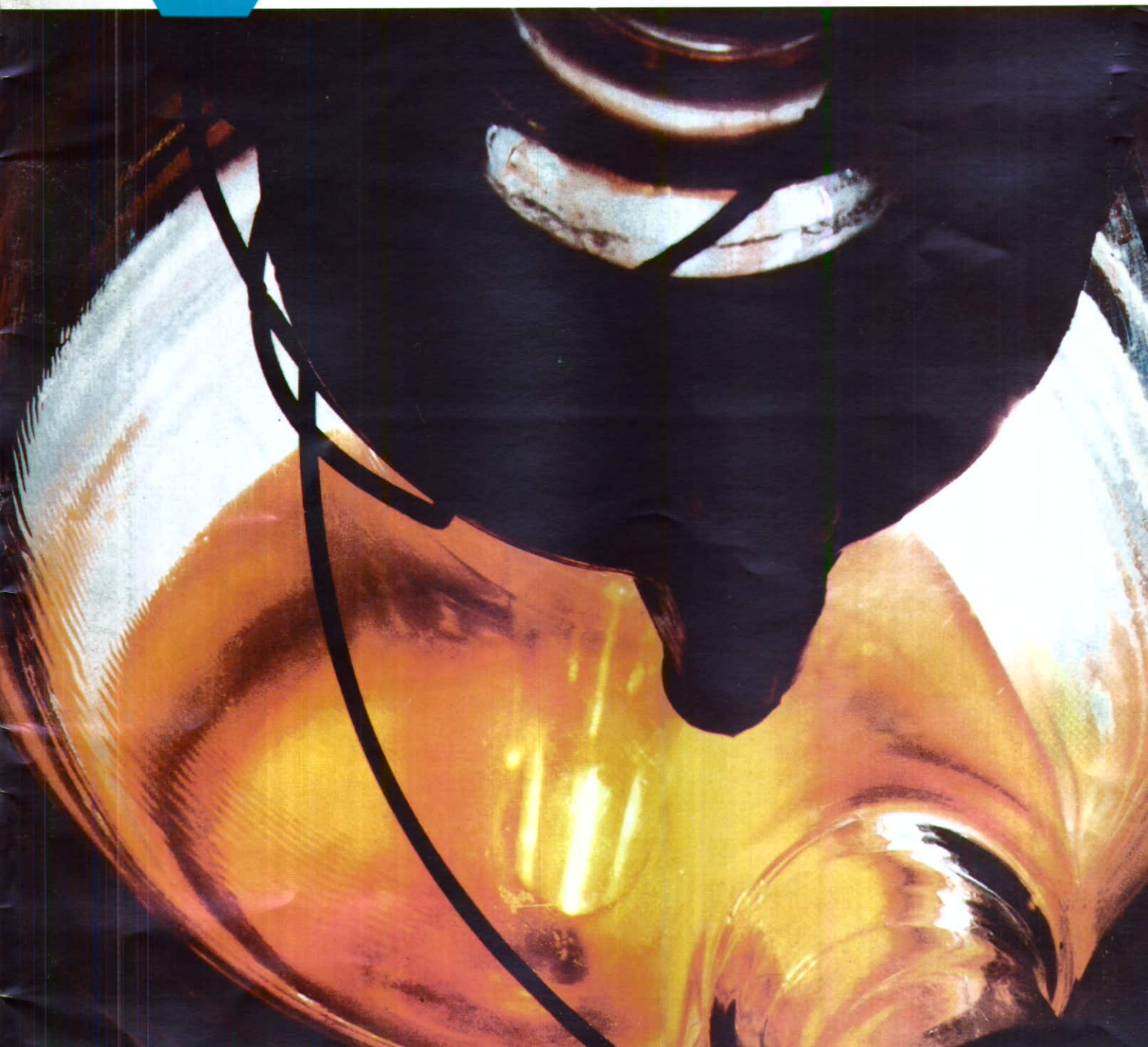
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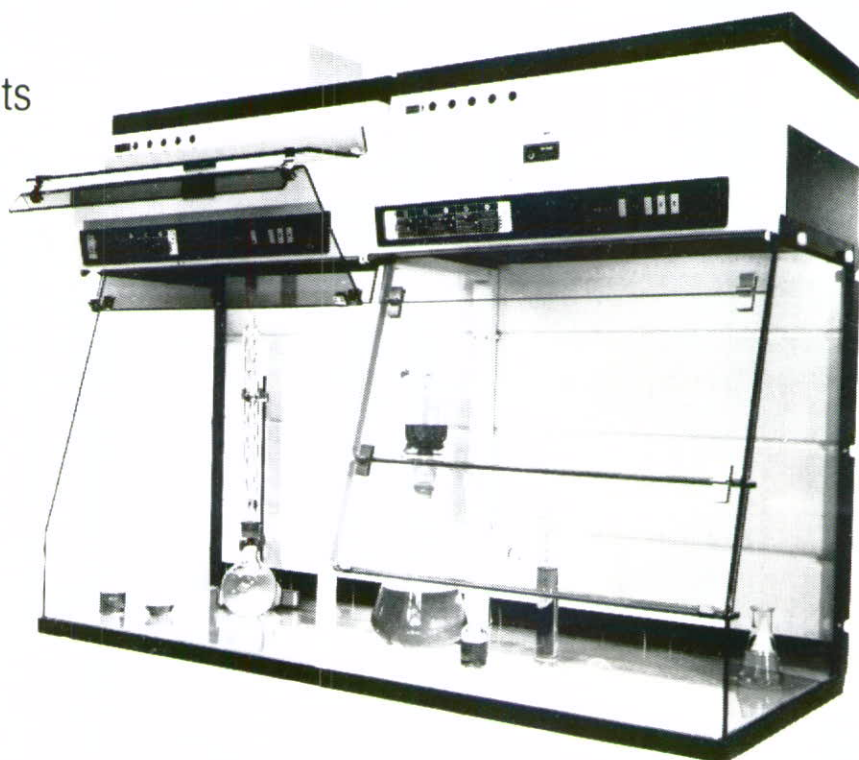
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FRONT COVER STORY: PAGE 56



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Outline of the Institute

The New Zealand Institute of Chemistry is the primary professional and learned society for chemists, biochemists, chemical engineers, and chemistry technicians in New Zealand. Membership is open to all with appropriate tertiary qualifications in chemistry, biochemistry, or chemical engineering. There is also a student grade of membership, while those persons with a general interest in chemistry, but without the necessary qualifications, may be local members.

Institute activities are many and varied. At the local level, regular Branch meetings, lectures, and social functions provide opportunities for members to meet informally with their colleagues, as well as to keep abreast of developments within the profession. Branches are also active in promoting chemistry in schools with various competitions and participation in science fairs. The Annual Conference of the

Institute is held at a different venue each year. The programme includes invited plenary lectures, specialist lecture sessions and workshops for the presentation of current research findings, trade displays, and social activities. In the public arena the Institute has a number of committees to present members' views on chemical hazards, the environment, chemical education, and public affairs generally. The Institute also has representatives on bodies such as SANZ, AAVA, and the Royal Society of New Zealand.

To assist its members in their profession, the Institute surveys salaries periodically and publishes a Code of Ethics, and Guidelines to Professional Employment. The professional achievements of individual members are recognised each year by the awarding of a number of Institute prizes.

The NZIC has links with the Royal Society of Chemistry, the American Chemical Society,

the Royal Australian Chemical Institute, the Federation of Asian Chemical Societies, and the International Union of Pure and Applied Chemistry. Members may therefore have the opportunity of participating in their activities and meeting chemists who visit this country under the auspices of the Institute. In particular, a visiting speaker scheme is currently operated with the RACI.

Application for membership of the Institute is made on a form available from the Registrar (PO Box 29-183, Christchurch). Current (1985) subscriptions for the main membership grades, including the cost of this Journal, are:

Fellows and Members (less \$5 if paid before 31 Aug.)	\$60
Associates (less \$5 if paid before 31 Aug.)	\$50
Graduates and Technicians (less \$5 if paid before 1 Aug.)	\$35
Students	\$10

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GUEST EDITORIAL

AWARENESS

Four important events which have taken place during the last year lead to the heartening feeling that there is emerging a heightened awareness and acceptance of technology and the downstream benefits associated with it.

First, and perhaps the development of the greatest long term significance, is the publication by National Research Advisory Council of a "Science and Technology Plan — the first steps". This is a plan which will be revised annually and aims to bring together the views and needs of the "users" and "doers" of science. It is reaching out to examine all sectors of the economy and its continuing refinement may be expected to provide a most valuable basis for funding of science and technology in both the public and private sectors. It

is interesting to note that already the discussions with the manufacturing sector have led to greater realisation of the benefits of science and technology and this may well be one of the most important results of the continuing discussions.

The second event was the quiet launching of the Industrial Technology Institute which consists of a representative group of some 70 or 80 key people involved in industrial research and development. This group has already held a top level meeting to study the possible effects on this country of the major tax benefits which have been proposed by Bob Hawke for Australian industry. The group has a close association with D.S.I.R. It is probably the first time that an effort has been made by the private manufacturing sector to bring together the nationwide needs in science and technology.

The third development was the establish-

ment of the "New Zealand Technology Advancement Trust" which was launched with quite a fanfare by the Prime Minister in November 1984. The objectives are primarily to promote awareness of the importance, needs and benefits of technology and to improve technology transfer. The Trust has the financial backing of the Government and is seeking support from the private sector. It appears that the Trust will have a very important impact on the economic welfare of the country.

Finally there is the decision to hold a conference dealing with "Science & Technology for Economic Development". This conference, which was initiated by National Research Advisory Council, will take place in May this year and will provide an opportunity to bring national science and technology needs right into the spot light. Essentially it will complement the other three developments and hopefully it will bring home the simple message that expenditure on science and technology is an investment.

A.W. Mackney, President

1985 NZIC/NZBS CONFERENCE

1985 NZIC/NZBS CONFERENCE
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Although August is some months off, preparations are well underway for the Conference; which will also include the Association of Chemical Biochemists for the first time. The Conference Theme, "Chemistry Becomes Computerized", was chosen in order to emphasise the impact of the microcomputer revolution on the practising chemist and, through the Computer Workshop, both educate members who may feel they are missing out on the new technology and to provide stimulating lectures and displays for those members who are already conversant with computer applications. Further details on the Workshop Programme will follow in the next issue. Four of the plenary speakers have accepted our invitation: Professor Smith from the Department of Chemical Sciences, University of Illinois; Professor Schreiber from the Russel Grimwade School of Biochemistry, University of Melbourne; Associate Professor Napper from the Chemistry Department, University of Sydney and Dr Ward Robinson from the Chemistry Department, University of Canterbury. Biographical details for Professor Smith and Professor Napper are reproduced below to be followed by the remaining plenary speakers in the next issue.



STANLEY SMITH
Department of Chemistry
University of Illinois
Urbana, Illinois, U.S.A.

Stanley Smith is a Professor of Chemistry at the University of Illinois. He received his B.S. degree from the University of California, Berkeley, in 1953, and a Ph.D. from the University of California, Los Angeles. After a year of postdoctoral research at UCLA he joined the chemistry staff at the University of Illinois. His research interests include the mechanisms of the reactions of Grignard and lithium reagents and the use of computers in the teaching of chemistry. He has developed programs for teaching general, organic, and polymer chemistry on the main frame PLATO computer system and on microcomputers. The title of his plenary lecture will be *Teaching Chemistry with a Microcomputer*.



D.H. NAPPER
Department of Physical Chemistry
University of Sydney

Don Napper is an Associate Professor in Physical Chemistry at the University of Sydney and until recently was the Head of School. After graduating M.Sc. from Sydney University in 1960, he read for his Ph.D. at King's College, Cambridge. He then spent several years at the CSR Research Laboratories before taking up a joint appointment as a Lecturer at the University of Bristol and a Research Officer with ICI Paints Division. He returned to the University of Sydney as a EIR Research Fellow in 1968 and was appointed to the staff in 1970. He held a Fulbright Senior Fellowship in P.J. Flory's laboratory in 1976 and was the Visiting Professor of Colloid Science at the University of Bristol in 1981.

Dr Napper's research interests lie mainly in the areas of polymer and colloid science. His lecture is to be titled *The Birth and Growth of Latex Particles*.

Please direct any inquiries to the Conference Secretary:

Dr Peter W. Harland
Chemistry Department,
University of Canterbury,
Christchurch 1.

LETTER TO THE EDITOR

CNG

Sir,

During a recent visit to Wellington I had cause to use the local taxi service, the vehicle was typically CNG powered, with the usual odour of mercaptan leak indicator, but, on removing my suitcase from the boot of the vehicle I inadvertently obstructed the exhaust pipe, and was at once assailed by a strong odour of formaldehyde.

I would be intrigued to know if members have noticed this effect, and whether it could be considered usual, or was it an isolated case due possibly to incorrect gas/air ratios in this vehicle.

Yours sincerely

Nigel Cummins

IUPAC DOCUMENTS

Two IUPAC Commissions have recently published documents that may be of interest to workers in the relevant fields. The documents are: Recommended Terminology for the Description of **Carbon as a Solid: Part I**, and **The Absolute Electrode Potential**. Anyone interested in perusing and/or commenting on these documents should contact R. Schoenfeld of the Australian Journal of Chemistry, P.O. Box 89, East Melbourne, Victoria 3002.

ELECTROCHEMICAL CORROSION PROTECTION — AN OVERVIEW

by

Leslie H. Boulton

Auckland Industrial Development Division, DSIR,

and Andrew Garner

Pulp and Paper Research Institute of Canada



Les Boulton is a Scientist in the Engineering Materials Group, Auckland Industrial Development Division of DSIR, where he specialises in corrosion science and technology. He graduated BSc and MSc(Hons)(1964) in chemistry from the University of Auckland. After a period at Monash University in Melbourne, as a Teaching Fellow, he lectured at the Footscray Institute of Technology, taught in secondary schools and lectured at a Technical Institute. He joined DSIR in 1980, where his research interests include electrochemical methods of corrosion monitoring. He is immediate Past-President of the Australasian Corrosion Association (NZ Branch) and is currently Technical Convenor and Education Officer. He recently spent time on a study visit at PAPRICAN working with Andrew Garner's group.



Andrew Garner is Head, Corrosion and Materials Engineering Section, at the Pulp and Paper Research Institute of Canada (PAPRICAN). He received a BSc (1968) in Metallurgy at the University of Liverpool, UK, and a PhD (1974) in Metallurgy at the University of British Columbia, Canada. He has worked as a metallurgist for Alcan Industries UK, as a Research Associate in Corrosion at the University of British Columbia, and as a Senior Research Engineer with Endako Mines Molybdenum Research in Ottawa where he studied the effects of welding on the corrosion resistance of stainless steels. He joined PAPRICAN to take his present position in 1978. His professional activities include membership of TAPPI and NACE corrosion committees.

INTRODUCTION

Large steel and stainless steel process vessels are expensive items of equipment in a chemical plant, and effective protection from corrosion can save millions of dollars in replacement of failed components.

Electrochemical protection systems which have been developed and put into service over the past few decades are proving to be very successful in these applications and more corrosion engineers in process plants are starting to acknowledge that electrochemical techniques present a valuable corrosion control strategy. Electrochemical corrosion protection systems are designed to maintain the electrochemical potential of a metallic structure in a range where corrosion phenomena are insignificant.

Electrochemical engineering principles are applied to regulate and distribute the current flowing through a process plant structure in order to maintain all metallic components in the potential "window" where corrosion is negligible, and to thereby provide the plant with effective long term corrosion protection.

PROTECTION TECHNIQUES

A convenient way of showing which corrosion products will form from a metal under certain conditions is by means of potential-pH diagrams devised by Pourbaix.¹ Figure 1 shows the reaction products of iron as a function of the Electrode Potential, E, and pH. This Pourbaix diagram can be regarded as an electrochemical map of the system, showing the oxidation products of iron obtained by varying the conditions of pH and potential.

At sufficiently negative potentials, the stable form is metallic iron, and this immune state is achieved by the technique of Cathodic Protection (CP). In the areas where the soluble Fe^{2+} and Fe^{3+} ions are stable, iron will corrode freely and this is called the active state. In the centre of the diagram there is a large area where ferric oxide is stable. Ferric oxide will form a layer on the surface of the iron, known as a passive film, which will diminish the corrosion rate of the metal. Iron can be passivated by raising its potential, this method being called Anodic Protection (AP). Oxidising acid chloride environments can cause pitting or crevice corrosion in the passivation region at higher potentials, and

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Dr **NICK WALSH** Geology Dept, King's College, University of London, talking about the Pye Unicam PU 9000 multi-element AA spectrophotometer.

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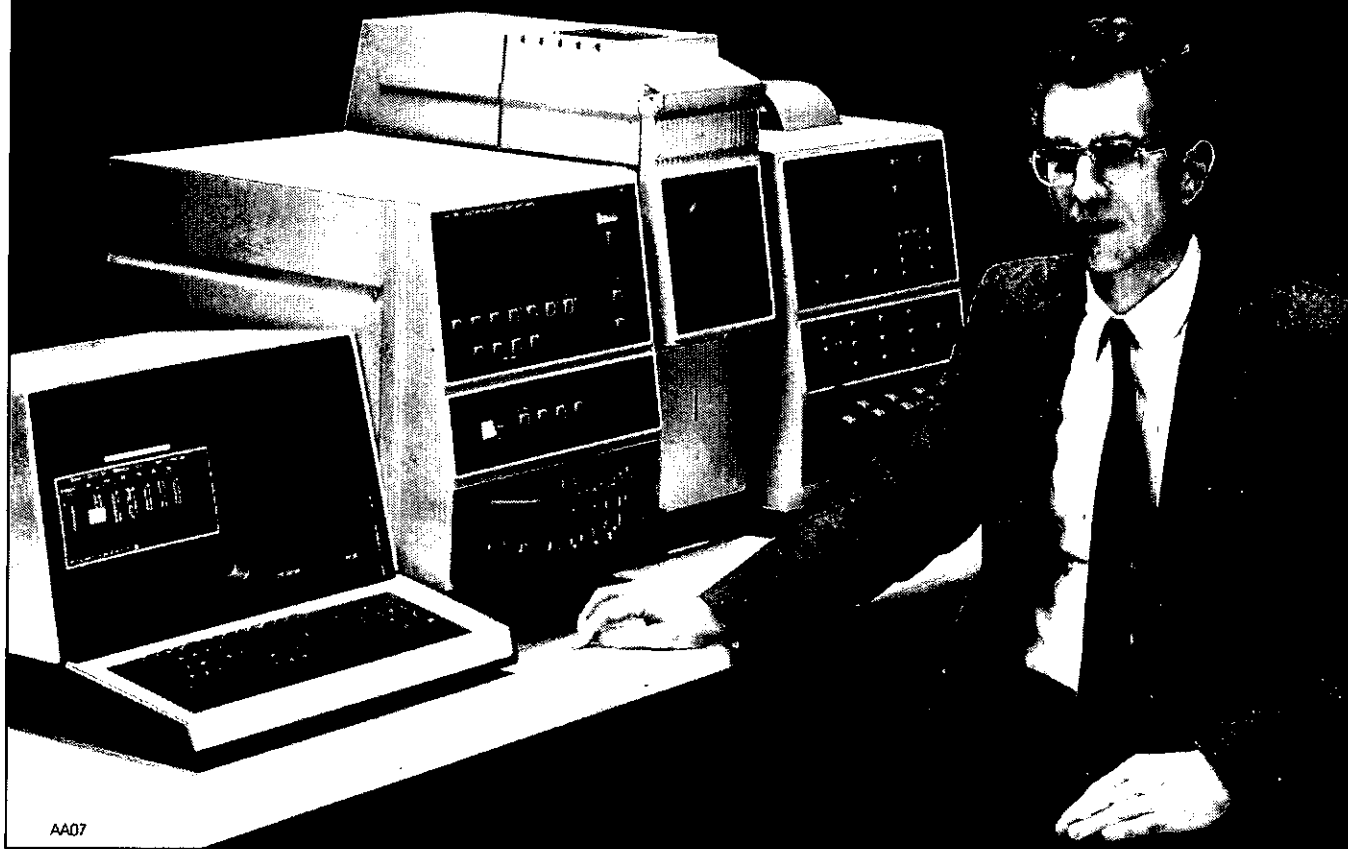
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in this case Electrochemical Protection (EP) can be employed. Electrochemical Protection is distinct from CP and AP in that it causes a passive metal (such as stainless steel) to be polarised in the cathodic direction to a pre-selected potential in the alloy's passive range.

important to apply a suitable dielectric coating which, in conjunction with CP will limit the cost of the protective system, because it will then be necessary to provide only enough current to serve the holidays in the coating instead of having to cathodically polarise the entire structure.

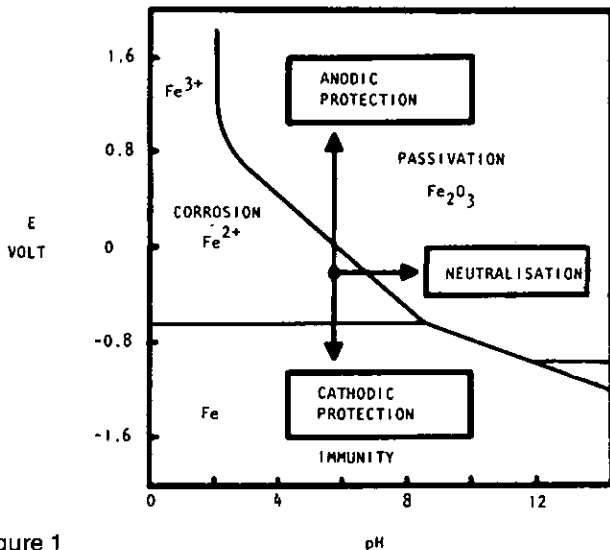


Figure 1

Pourbaix diagram for iron showing conditions for corrosion, passivation and immunity. The initial state of iron in neutral water is shown at the centre of the diagram. Decreasing the potential results in cathodic protection while raising the potential results in anodic protection. Increase of pH will also move the iron into the passive region.

ANODIC PROTECTION (AP)

Anodic protection is much less common than CP and can only be applied to metallic components which exhibit an extended range of passive behaviour when polarised in the anodic direction. The structure to be protected is made anodic by polarising it in the positive direction to a predetermined controlled potential, using a DC power supply and an inert cathode, and monitoring the potential of the protected structure with a standard reference electrode. The current required to both establish and maintain protection depends upon the solution composition, temperature, concentration and the metal.

AP has been widely used to control corrosion of equipment such as stainless steel tanks and heat exchangers used in the handling and production of sulphuric acid.⁵ A recent application of AP in the pulp and paper industry has been the protection of a carbon steel continuous digester used for the soda pulping process where a device was installed to protect the impregnation zone of the steel shell.⁶ After several years of service the system is operating successfully and recent results on the application of AP to kraft pulp continuous digesters (as used in New Zealand) have been encouraging in the mitigation of general corrosion and erosion-corrosion of the shell walls.⁷ Extensive laboratory research has shown that anodic protection should diminish stress corrosion cracking of welded areas of the digester shells⁸, a serious problem which has afflicted the pulp industry worldwide in recent years⁹. Results from a number of anodically protected digesters are awaited with interest.

ELECTROCHEMICAL PROTECTION (EP)

Electrochemical protection is a technique applied to stainless steels in oxidising and often acidic environments, whereby the protected component is polarised in the cathodic direction to a predetermined potential in the passive zone for the alloy. The polarisation is achieved using a controlled DC power supply and an inert anode. An interesting example of this corrosion control system has recently been developed for chlorine (C-Stage) and chlorine dioxide (D-Stage) type 317L stainless steel bleached pulp washers which can suffer from severe pitting corrosion.^{10,11}

Corrosion of C-stage washers is caused by the electrochemical reduction of chlorine to corrosive chloride at cathodic sites:

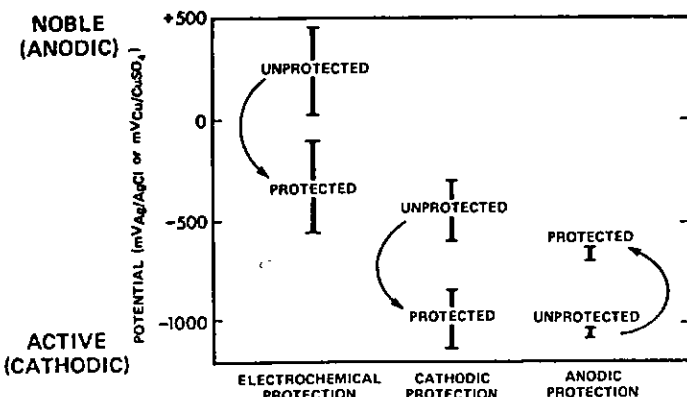


Figure 2

A summary of the changes in potential which result from typical applications of electrochemical, cathodic and anodic protection.

CATHODIC PROTECTION (CP)

Cathodic protection is widely used to protect mild steel components in moderately neutral environments, such as soil or sea water and is achieved by polarising the protected component to low potentials, usually more negative than -850mV Cu/CuSO_4 . Since metallic iron is thermodynamically stable below this potential, the protected component does not corrode. The structure may be protected using sacrificial anodes made of magnesium, zinc or aluminium alloy; alternatively, an impressed current technique may be employed, in which the anode is inert (often graphite, high silicon cast iron, platinised titanium, or platinised niobium) and power is supplied from a DC rectifier.

Cathodic protection is used routinely in a wide range of industrial applications, such as buried steel pipelines supplying process plants with gas, water, hydrocarbons or chemicals. The bottoms of steel storage tanks resting on the ground may be effectively protected from the underside, as may the inside of tanks and vessels containing water or dilute chemicals. The steel components of effluent clarifiers and water intake screens are other examples of immersed metal parts that are particularly appropriate for protection by CP²⁻⁴. In many cases, it is most

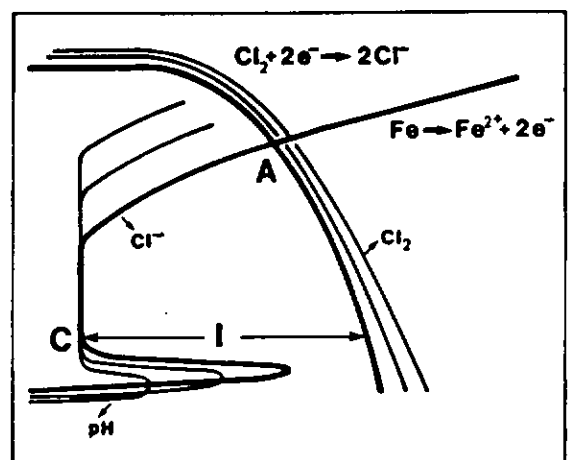
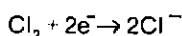
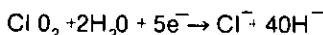


Figure 3

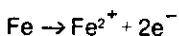
Schematic polarisation curves for reactions occurring at the surface of a stainless steel washer. Without protection, the chlorine causes localised corrosion to occur at a higher potential and average current density (Point A); corrosion is suppressed if the washer potential is lowered, with protection current I, so that the stainless steel is passive (Point C). The effect of increasing Cl^- and Cl_2 concentrations, and pH on the shape of these curves is indicated by small arrows beside the respective symbols.



When chlorine dioxide is present (as in D-stage washers) an equivalent reduction can occur:



The anodic dissolution reaction for the steel may be approximated as:



Although the cathodic reduction reactions may occur initially under activation polarisation, at lower potentials and higher currents the reduction rate is controlled by concentration polarisation. The electrochemical basis of the protection method is illustrated in Figure 3, for a chlorine stage washer environment.

Figure 4 shows a typical electrochemical protection system for a bleached pulp washer. Corrosion monitoring coupons are mounted onto the side of the drum, to verify the efficacy of the protection system. The improved performance achieved by EP of the 317L has been shown to be close to that gained by upgrading 317L to a much more expensive unprotected high-alloy austenitic stainless steel.¹²

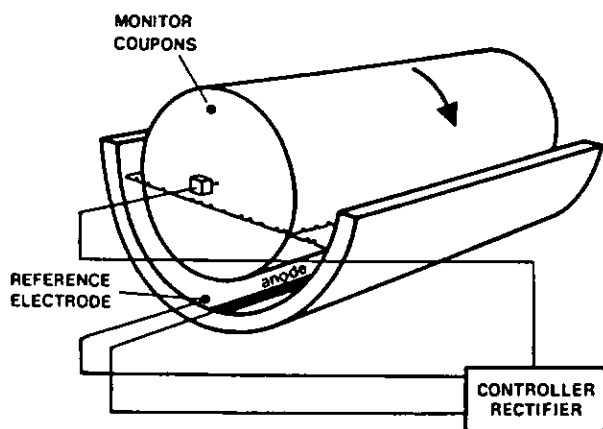


Figure 4

Components of a system of electrochemical protection of a bleached pulp washer ("Papritection").

Electrochemical protection devices have also been designed to control corrosion of valves and flue gas scrubbers.¹¹ An additional benefit of EP is in the area of process control, where process upsets such as oxidant concentration fluctuations and pH changes may be detected (and corrected) by monitoring the rectifier current output from the EP system.

COMPUTER MONITORING

Corrosion protection of large process vessels by electrochemical methods has become both reliable and cost-effective over the past decade. As their usage grows with increasing acceptance by corrosion engineers, monitoring methods will need to provide reliable data which is free of human error. A real advance in this area of corrosion data monitoring from remote

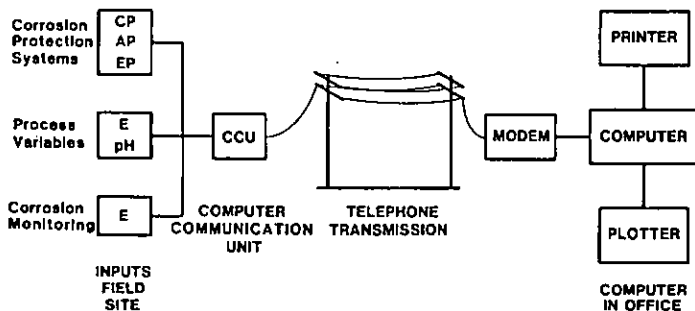


Figure 5

Diagram illustrating how the electrochemical data is transmitted from the installation site to the microcomputer.

in situ electrochemical probes, is the combination of data acquisition techniques with telephone transmission and micro-computer software. The concept is illustrated in Figure 5.

The electrochemical probes transmit their signals to a computer control unit where the information is processed and stored. When the unit is called up on the telephone via a Modem (which can be located at any distance away from the site), the CCU downloads its stored data in a compressed form. The microcomputer processes the data and produces trend reports in histogram format which indicate if the system has functioned properly over the period of time. This system is particularly suited to the protection installations on large process vessels such as in paper mills or chemical plants where reliable potential-adjusted corrosion protection techniques are becoming essential for round-the-clock operation.

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THE PHYSICAL CHEMISTRY OF SOLUTIONS

Festschrift for Professor H.N. Parton

edited by

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(Plenary lectures of a Symposium in honour of Professor H.N. Parton held by the New Zealand Institute of Chemistry during its Golden Jubilee Conference in Auckland, August, 1981)

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I.U.P.A.C. The International Union of Pure and Applied Chemistry

by
Arthur D. Campbell, University of Otago

Arthur Campbell is currently Mellor Professor and Chairman of the Department of Chemistry at University of Otago, a Department from which he graduated a good few years back. He is a former President of the Institute. He is a National Representative on the IUPAC Commission on Microchemical Techniques and Trace Analysis, has represented New Zealand at Council meetings on three occasions and in 1981 he was elected to the Bureau of IUPAC.



Most students hear of the IUPAC rules of nomenclature, and may even know that IUPAC is associated with the fixing of the atomic weights which we use. But that is about the extent to which this international body of chemists is known to most scientists. IUPAC is quite a complex organisation, and I hope this article will go somewhere towards explaining what it is, what it does and how it works.

When the International Union of Pure and Applied Chemistry was first established in 1919 its aim was to provide a forum where matters affecting chemists throughout the world could be resolved. The major objectives were to facilitate the exchange of information and to formulate and standardize rules for chemical nomenclature, terminology, etc. It was recognised that the flow of scientific knowledge between countries would best be served by the adoption of uniform systems. IUPAC was among the first of the Scientific Unions to be founded and today it is the largest. It is a voluntary, independent, non-profit-making, non-governmental association of national organisations each of which represents the chemists of the 45 member countries.

NATIONAL ADHERING ORGANISATIONS

The members of IUPAC are the National Adhering Organisations of the various countries who pay dues according to the extent of chemical industry in that country. For New Zealand, the annual dues amount to \$US2500 and the Royal Society of New Zealand is the National Adhering Organisation. National Adhering Organisations send delegates to the biennial Council meetings of IUPAC and a small number of developing countries send observers. Each National Adhering Organisation is allocated between one and six votes on Council, depending on the dues level, and they may nominate delegates up to this number. New Zealand currently holds two votes at Council meetings.

COUNCIL

The Council of IUPAC is the forum at which all the National

Adhering Organisations have an opportunity to discuss general policy matters. Council elects the officers of the Union, the President (currently, Dr W.G. Schneider, Canada), Vice President (Professor C.N.R. Rao, India), Secretary General (Professor T.S. West, U.K.) and Treasurer (Professor A. Bjorkman, Denmark). Council is concerned with the Statutes and Bylaws and in general oversight of the activities of the Union particularly with respect to new policies. But anyone who is familiar with committee work will know that a group of over 140 delegates, many of whom are speaking in a language which is not their native tongue, will accomplish very little even in 1½ days unless given direction. Major programmes and policies are subjected to a vote but the work which reaches Council has normally been thoroughly discussed at sub-Committee level.

BUREAU

The Bureau of IUPAC consists of the elected IUPAC Officers, the Immediate Past-President, the seven chairmen of the Divisions into which the various scientific areas of Chemistry are divided for administrative purposes, and at least 10 members elected by Council from among the delegates. The Bureau meets annually at the General Assembly immediately prior to the Council meeting, and again in the year between Council meetings, and it is more closely concerned with the general running of the Union. With representation from both the scientific Divisions and the Council it is able to receive reports from various Committees and Commissions, oversee the appointment of members of Divisional Committees and Commissions, and ensure the smooth running of the Union. Some committees such as those concerned with finance and publications report directly to the Bureau. The Bureau appoints a small Executive Committee which may be called together quickly when necessary to deal with Union matters and where appropriate the President may act on behalf of the Union.

DIVISIONS AND COMMISSIONS

The main scientific work of the Union is carried out by the Commissions which belong in the main to the seven Divisions; Physical, Inorganic, Organic, Macromolecular, Analytical, Applied and Clinical Chemistry. There are about 34 Commissions and several Committees working on scientific matters. The Commissions are made up of three different categories of scientist. Titular Members (currently restricted by financial considerations in general to six per Commission) and Associate Members are normally nominated by the Commission with a view to obtaining expertise in particular areas of interest for project work, while National Representatives are nominated by the National Adhering Organisations. In this way a country has the opportunity to nominate a member to a Commission and that person then has the means, through his work, to progress through the categories of membership. Only Titular Members, however, receive financial support to attend meetings and it is difficult for N.Z. scientists to be present unless they are on leave near the site of a General Assembly. Nevertheless many National Representatives probably make as great a contribution to Commissions as Associate Members. General policy matters are formulated at Commission meetings but the main work of the Commissions is carried out by the members in their home institutions and by correspondence. The work of the Commissions is critically reviewed every two years by the Vice President of the Union. Some are disbanded because the assigned project is complete or if no apparent progress is being made, and new Commissions are formulated when required. Council has placed a restriction on the number of years a person may serve in various Commissions and Committees in order to ensure a reasonable turnover of personnel, and to try to get a wider range of chemists involved in the work of IUPAC. New Zealand has about 10 chemists on Commissions as Associate Members or National Representatives. Those interested in acting on Commissions should notify the N.Z. National Committee for Chemistry (see below) but only those who intend to participate in the work of a Commission should seek nomination. The Bureau is aware that National Representatives are costly to the Union, because of the number involved, but this is one way in which the work of the Union can become better known and it also affords more people an opportunity to participate.

It would be appropriate to record a few illustrations of the work of Commissions. Three Commissions deal with nomenclature of inorganic, organic and macromolecular compounds and a joint IUPAC-IUB Commission is concerned with the nomenclature of biochemical compounds. Their publications include "Nomenclature of Inorganic Chemistry", (1970 — The Red Book), "Manual of Symbols & Terminology for Physicochemical Quantities and Units", (1979 — The Green Book) and "Biochemical Nomenclature and Related Documents". Terminology is also important and Commissions in the Analytical Division have compiled the "Compendium of Analytical Chemistry", (1978 — The Orange Book). Other Commissions have published reports in the official journal of IUPAC, *Pure and Applied Chemistry*, such as a "Glossary of Terms used in Physical Organic Chemistry", "Symbolism and Terminology in Chemical Kinetics" and "Quantities and Units in Clinical Chemistry" to name a few. Standard test methods receive attention from several Commissions. For example, the Commission on Oils, Fats and Derivatives has published the reference source "Standard Methods for the Analysis of Oils, Fats and Derivatives", and they continue to replace outdated tests and introduce new procedures. They rely on the participation of members in collaborative studies to check the recommended procedures. The compilation and evaluation of chemical data is another important aspect of the work of IUPAC. About 30 books have now been published in the "Chemical Data Series" and a more recent major programme is the "Solubility Data Series". When complete this latter series will comprise about 100 volumes and include solubility data on virtually every solid liquid or gaseous compound which dissolves in some solvent. From these few illustrations it should be apparent that the major scientific contribution to the work of the Union is carried out by those involved in project work for the various Commissions.

CONGRESSES, SYMPOSIA AND CONFERENCES

The biennial IUPAC Congresses are the responsibility of a nominated National Adhering Organisation. The 1985 Congress will be held at Manchester and run by a committee responsible to the Royal Society which is the U.K. National Adhering Organization. These congresses are scientific meetings with review and research papers presented in a selected range of fields of chemistry and particularly in those not adequately covered in the various international symposia series. In addition, IUPAC sponsors about 30 symposia and conferences each year, but again the Union relies on a small dedicated band of local people to organise these meetings. While it is essential for these sponsored meetings to be truly international, and the general program must be approved by the appropriate Division, they should also be self supporting. IUPAC may contribute money to help participants from developing or distant countries, but that is the extent of financial assistance. However, sponsorship by IUPAC is important because it ensures international recognition particularly at the political level. There have been several instances where governments have attempted to restrict participation by chemists from certain countries because of differences in political philosophies. Threat of removal of IUPAC sponsorship for that meeting (and any subsequent meetings) has, so far, ensured the freedom of movement of scientists between countries. IUPAC has to rely on early notification of such instances but the machinery is there for prompt action should the need arise. Also it would appear that scientists from some countries have difficulty in attending other than sponsored symposia.

IUPAC SECRETARIAT

IUPAC maintains a small secretariat at Oxford headed by the Executive Secretary, Dr M. Williams. This office provides a contact point with IUPAC for chemists around the world. It also provides the personnel to service meetings of various committees, and is largely responsible for the organisation of the General Assembly and meetings of the Bureau etc.

IUPAC PUBLICATIONS

The official scientific publication of the Union is the journal, *"Pure and Applied Chemistry"*, of which there are 12 issues per year. It contains plenary lectures from Congresses and sponsored Symposia and miscellaneous reports from Commissions. However, many Commission reports justify separate publication in book form. The news magazine "Chemistry International" contains news of IUPAC activities and lists of forthcoming international meetings. A supplement published biennially — IUPAC Handbook — contains lists of IUPAC Officers, Division and Commission members, current programs under consideration by the various commissions and other data concerned with the Union. There is a Committee on Publications to oversee this work and the Union maintains a Scientific Publication Secretary at Oxford to facilitate these activities. Pergamon Press has been the official publisher for IUPAC since 1976 but from 1985 Blackwell Scientific Publications will hold this position.

INTERNATIONAL SCIENTIFIC UNIONS

IUPAC is a scientific member of the International Council of Scientific Unions (ICSU) which brings together the scientific Unions of all the different branches of science. It is interesting to note that representatives from New Zealand were among the original group from 12 countries which set up the International Research Council in 1919. However membership of this body was restricted for political reasons and the truly non political International Council for Scientific Unions dates from 1931. ICSU has been instrumental in facilitating the cooperation which has taken place in such projects as the International Geophysical Year and the collaborative research projects we have seen in Antarctica.

N.Z. NATIONAL COMMITTEE FOR CHEMISTRY (1984)

A.D. Campbell (Convener), A.M. Brodie, B. Halton, G.J. Leary, H.J. Percival, W.S. Simpson (P.K. Grant, Secretary).

The author is grateful for permission to use articles in 'Chemistry International' 1982, No. 4, p.17 and 1983, No. 1, p.6 in the compilation of this account of the activities of IUPAC.

1985 BRANCH CHAIRMEN

Auckland — Dr W.A. Denny

Dr Bill Denny, Auckland Branch Chairman for 1984, has been returned for a second term of office. Bill's career details were published in Chemistry in NZ, February, 1984.

Waikato — R.P. Newth

Ron Newth is a Senior Technical Officer at Ruakura Agricultural Research Centre where he has managed the analytical laboratories of the Dairy Science and Protein Extraction group for many years. The group comprises animal nutritionists, agronomists, physiologists, chemical and civil engineers and hence generates an unusually diverse range of analytical requirements. Some major ongoing projects include: respiration calorimetry using four large chambers for cattle; commercial development of leaf protein extraction technology and production of fuel alcohol from pasture residues.



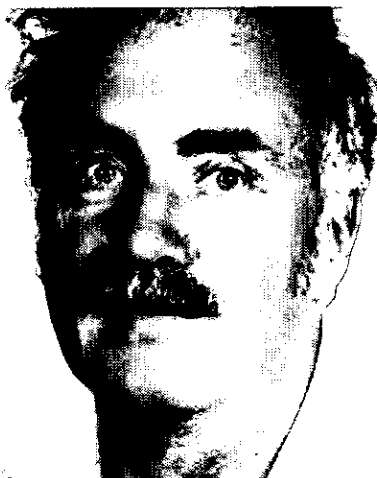
After leaving school with 'A' levels in science, he spent two years of compulsory military service in the R.A.F. and first worked as a technician in the laboratories of Coates Bros. dealing with surface coatings. This was followed by four years with U.K.A.E.A. (now British Nuclear Fuels). Marriage and emigration to New Zealand occurred virtually simultaneously in 1959 when he joined the Nutrition Section at Ruakura. From small beginnings with a single laboratory the section now encompasses two separate buildings housing a large group of both graduate and non-graduate technicians.

In 1975 he was elected to full membership of N.Z.I.C., has been a member of the branch committee since 1979 and branch secretary for the past three years. Favourite outdoor pursuit is walking while his principle "indoor" interests centre on family, friends and music.

Manawatu — D.R. Body

Denis Body was born in Wellington, educated in Lower Hutt and attended Victoria University where he received his B.Sc. (1959) and M.Sc. (1960) with first class Honours in Physical Organic Chemistry under the late Professor Brian England.

His career commenced in the Fats Research Laboratory (under Dr Brian Shorland) until he was awarded a National Research Fellowship (1961) to pursue studies at the Lister Institute of Preventive



Medicine, London (1964-68) on the lipid composition of lung surfactants related to respiratory distress syndrome with the guidance of the late Dr Maurice Gray.

In 1970 he was transferred to Applied Biochemistry Division, where he has since remained. Here he has extended his interests to identify the unusual lipid components isolated from a variety of biological sources. He believes you must understand the chemical nature of the identified compounds before you can attempt to elucidate their biological role.

These approaches have been applied to investigate the lipid composition of deep sea fish oil (e.g. orange roughy) and the egg contents of a variety of endangered species e.g. kiwis, takahē, cassowary and tuatara. This latter work, in conjunction with the Wildlife Service, is part of the programme to improve their corresponding survival rates.

After assisting to raise a family of two sons with his wife Jenny, he has been able to have other interests. He has served as a Secretary to the Taita Rugby Football Club, and currently is engaged as the Session Clerk (to a Presbyterian Parish) and an active member of a Boys' Brigade Company. In his spare time he became a member of the Institute (1963) and helped as Branch Secretary over the past 3 years.

Wellington — P.G. Best

Phillip Best was born in England in 1952 and immigrated to New Zealand in 1960. He was educated at Tawa College and received his B.Sc. in chemistry and biochemistry from Victoria University in 1974. In 1975 he joined Mobil Oil Ltd as Assistant to the Special Products Manager, and in 1977 moved to NZ Industrial Gases as Product Manager (Special Gases) and then Manager (Gas Products). For the last year or so he has been Marketing Manager for Robert Young & Co. N.Z. Ltd.

Phillip's Institute activities have included a period as Branch Secretary. He also has a keen interest in photography.

Canterbury — A.F.H. Baker

Alf Baker is a Canterbury graduate, with an M.Sc. awarded in 1949, followed by a B.A. (1960). He worked initially for two years as a research assistant at Lincoln College, and then took up a lectureship in organic chemistry at University College, Ibadan, in Nigeria. After seven years he returned to Christchurch where he held teaching positions at Linwood High School and Hillmorton High School (Head of Dept, 1961-73). During this time he also held the teaching

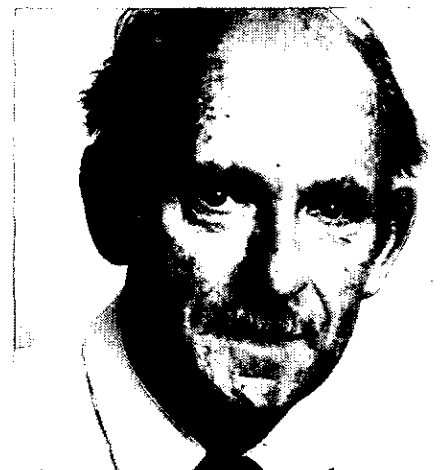


fellowship for chemistry teachers at the University of Canterbury. In 1974 he was appointed to a lectureship at Christchurch Teachers College, and is now a senior lecturer.

Alf's other activities have included secretary of the Canterbury Junior Chemical Society, President of the Canterbury Science Teachers' Association, and Science Advisor for the Dept of Education. He also has a strong interest in music, and has been president of the Christchurch School of Instrumental Music, and secretary for ten years for the National Secondary Schools Orchestral Course.

Otago — C.W. Thomson

Bill Thomson graduated with a B.Sc. degree in Chemistry from the University of Otago in 1952. After working in the Chemistry Department for a further year with Dr. W.S. Fyfe, he was appointed Science Master at John McGlashan College in Dunedin, where he stayed until he embarked upon a career in industry by joining Fletcher Industries' Linseed Oil Division as Chemist in 1957. Subsequently, he became Chief Chemist, Production Manager, then Factory Manager with Fletchers, gaining an expertise in the analysis of oils and fats, and experience in the development of adhesives and sealants. He later returned to laboratory work, concerning himself with stock food and technical services with the fledgling lucerne drying industry. In 1975 he left Fletcher Industries, and took up his present position — Chief Chemist with soap manufacturers, McLeod Bros. of Dunedin.



Bill became an Associate of the Institute in 1960, has served as a member of the Branch Committee on several occasions since then, 1967 being spent as Branch Chairman. His other interests include music, cricket, rugby and gardening.



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WN39

OBITUARY



Oswald Hilton (Tony) Keys died in Auckland on 25 February, 1985.

Born in Wellington in 1910, he was educated at Wellington College and Victoria College,

where he graduated M.Sc. He was a foundation member of the NZIC of which he was made an Honorary Fellow in 1975. He will be remembered by some as a keen advocate of a Royal Charter for the Institute and as first Editor of the Journal, a post he took up in 1936. He also served the Institute on two occasions as Chairman of the Otago Branch, as Chairman of the Examinations Committee, and on the Council. He was also an Associate of the Royal Institute of Chemistry.

After graduating, Tony held a post-graduate scholarship at Massey College, following which he joined a firm of consultants before being appointed in 1936 to the Dominion Laboratory (now Chemistry Division) of the DSIR. His work included determining the vitamin content of local foods, and the optimum conditions for curing lemons. During World War II, he worked on shark repellants, a necessity for airmen shot down over the sea.

In 1945 he was appointed Government Analyst, Dunedin, when that Branch was about rapidly to increase in staff and range of duties. Besides the usual work for other Departments, the laboratory set out to assist industry, and Mr Keys was Chairman of the Otago Interdepartmental Committee on Paint Quality.

He was appointed Government Analyst in Auckland in 1958, where he continued his emphasis on applying science to the needs of the public. This period in Auckland (58-75)

saw a rapid growth in forensic science in particular within DSIR. Other growth areas included the beginnings of studies into the chemistry of New Zealand wines, and a service to local manufacturers, particularly in the plastics field.

Tony Keys held a life-long concern for the application of science in the service of the community. In 1936 he became a member of the Consumers Institute Committee on consumer standards. He continued to serve the consumer movement for many years as a member and chairman of the national council, and of the Auckland branch. Other activities included the Auckland Air Pollution Research Committee and the Australasian Corrosion Association, of which he was Federal President in 1962. He did a lot of work for the Standards Association of N.Z. and was very proud of having the rare distinction of Honorary Life Membership conferred on him. He became a J.P. in 1951. He also served as chairman of the Otago Branch of the Royal Society, and was President of the N.Z. Association of Scientists in 1944.

Tony shared with other members of his family a keen interest in music and played the violin. He prided himself on keeping up with the chemical literature, and with all these interests, he lived a full and useful life. He is survived by his wife Lilian, and two sons.

D.F. Nelson, S.G. Brooker

HONORARY FELLOWSHIP

BRANCH NEWS

DR DONALD REES LLEWELLYN HONORARY FELLOW

At the February 1985 meeting of Council Dr D R Llewellyn, who recently retired as Vice Chancellor, University of Waikato, was elected an Honorary Fellow of the NZIC.

Dr Llewellyn came to New Zealand in 1957 to take up the position of Professor of Chemistry and Director of the Chemical Laboratories in the University of Auckland. Prior to that he had been a lecturer (1952-56) and had also held an ICI Fellowship (49-52) at University College, London. His research interests were in the applications of stable isotopes to the study of reaction mechanisms. While at Auckland this led to his fostering of the development of the Urey Radiochemical Laboratory for teaching and research in this subject. He was also the guiding hand in the planning of the Chemistry Department's new building which was completed in 1968.

Mr N W Kingsbury, Assistant to the Vice-Chancellor, University of Waikato, has prepared the following appreciation of Dr Llewellyn's time in Hamilton:

In 1964, Dr Llewellyn was appointed foundation Vice-Chancellor of the new University of Waikato. For more than twenty years, until his retirement on 31 January 1985, he devoted himself tirelessly to the development of the University. He was determined that it would, right from the start, be strong both in its teaching and its research and that it would have a wide network of close relationships with the communities in its region. He left the University a well-established institution with its degrees recognised throughout the world, its research commanding international attention and its links with the New Zealand community forged in a great variety of ways. Nearly four thousand students are taught in five schools of studies: Humanities, Social Sciences, Science, Management Studies and the Waikato College of Teacher Education. There are specialist centres or research units for Maori studies and research, continuing education, population studies, thermophile and microbial biochemistry and biotechnology, antarctic research,



science education, environmental studies, inflation accounting and inter-firm comparison in management studies.

The University has an especially close relationship with the Hamilton Teachers' College with which it shares a campus. It has also close links with Ruakura Agricultural Research Centre, the Waikato Technical Institute and the community colleges in the region. Dr Llewellyn also gave a great deal of attention to the physical development of the campus. From an almost bare site with one small university building on it in 1964, the Waikato campus has developed into a very beautiful, planned environment with attractive buildings, lakes and planting.

Dr Llewellyn has maintained his interest in research nationally through membership of the Atomic Energy Committee, the Pottery and Ceramics Research Institute, the Fertiliser Manufacturers Research Association and the Meat Industry Research Association. Chief among his other interests locally is the highly successful Fielddays Society, in which he has been a key figure since its inception. Dr and Mrs Llewellyn will live in retirement in Hamilton.

Manawatu

Dr David R. Husbands of the Department of Chemistry and Biochemistry, Massey University, addressed the first branch meeting for 1985 on the topic: "Long Chain Fatty Acids, Their Function and Metabolism". After a brief introduction to the "families" of fatty acids, Dr Husbands described how the "essential" fatty acids are converted into various physiologically important compounds. He also showed how the metabolism of fatty acids in cats and in sheep differ from that of other animals and the importance of these differences.

Wellington

The first branch meeting for 1985 heard an informative discussion on New Zealand Coal from Dr. V.R. Gray, Chief Chemist of the Coal Research Association of New Zealand.

Canterbury

The February meeting took the form of a tour of Lion Breweries in Christchurch. The tour started with a look at the canning side of the process followed by a wander around the Brewing house where we learned something of the batch cooking process, continuous fermentation and storage or lagering. This was followed by a light supper where we were able to sample some of the product.

To conclude the evening we were given another talk on the brewing process (for those who missed it over the hum of machinery) and the marketing of the final product. Most of us were quite impressed with the daily output of beer from this one brewery especially when our average daily intake was taken into account. Someone must be consuming it!

Otago

An organising committee for the Annual Conference of the Institute, 1986, has now been convened under the chairmanship of Prof A.D. Campbell. The Conference is to be held from 25th to 28th August, 1986, in conjunction with a meeting of the Australia and New Zealand Society for Mass Spectrometry. Dr John Cutfield is to be Secretary.

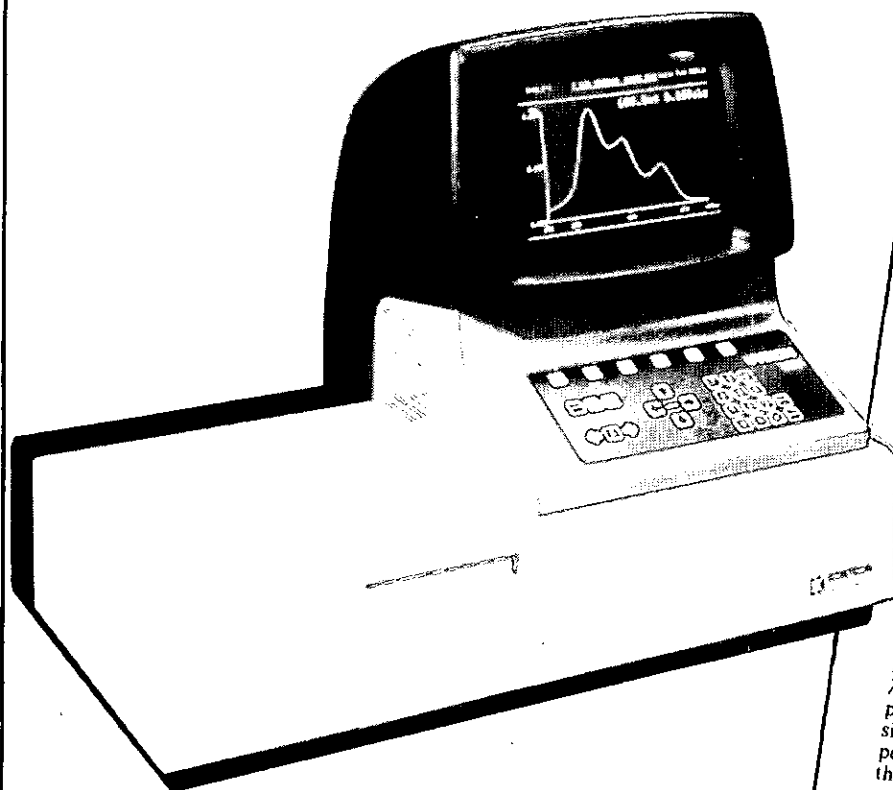


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COUNCIL NEWS

Mr A.W. Mackney presided over meetings of Council in Wellington on Thursday 7th and Friday 8th February. He welcomed Dr B. Halton, 2nd vice-President, Mr P.G. Best, Wellington Branch Delegate and Dr R.A. Smith, Otago Branch Delegate, as new members of Council.

Prizes 1985. Members are reminded that applications for the ICI, Shell and Essay Prizes close with the Administrative Secretary, PO Box 29-183, Christchurch, on 30th April.

Subscriptions. Council resolved to increase the subscriptions of Members and Fellows by \$10 for the year beginning 1st May 1985 to \$60, reducible to \$55 if paid before 31st August 1985. For Associates the new subscription is \$50 and for Graduates and Technicians \$35, all reduced by \$5 for early payment. The Student subscription remains at \$10.

There was no increase in subscription in 1984/85, a \$5 increase in 1983/84 and an \$8 one in 1982/3. By way of comparison, from July 1 1985 the RACI subscription for Fellows and Associates is A\$102 and from January 1 1985 the Student subscription is A\$17 and A\$64.50 for Graduates.

Council resolved to establish a finance committee with the President, 1st vice-President, General Secretary and Registrar as members. It was also resolved to contribute in 1985/86 \$2000 to the Prince and Princess of Wales Awards, administered by the Royal Society of New Zealand.

Salary Survey. A survey of Members' salaries as at 1.4.86 is to be arranged to up date the material published in August 1982.

Membership Applications and Rules. Council resolved that applications for the Technician and Graduate grades of non-corporate membership did not require referees' reports or reference to the Membership Committee. This resolution is designed to assist the handling by the Registrar of applications from holders of NZCS and B.Sc. academic qualifications in chemistry and biochemistry.

For a trial period further change is to be made to the procedures for handling applications for the Associate, Member and Fellow grades. The Registrar is now to write for the referees' reports. This change should make the Registrar aware of the status of all applications and ensures that Branch Committees and their interview panels have access to all material subsequently submitted to the Membership Committee and Council by the Registrar. Council agreed to some changes in wording to the 1976 edition of the Code of Ethics, Rules and Commentary in addition to those which had been circulated by Branch Committees and Council in December 1984. It is planned to publish this revision in the 1985 Year Book together with the List of Members in the non-corporate grades of Student, Technician, Graduate and Associate and corporate grades of Member and Fellow.

The rules dealing with Life Membership were changed to provide for members retiring before 65 who have paid subscriptions for not less than 20 years. If Life Members wish to continue to receive "Chemistry in New Zealand" they are now required to pay its cost.

Recruitment. Council resolved to make available to Branch Committees a recruitment package of a letter from the President, a membership form and information about the advan-

tages and cost of membership etc for distribution to final year NZCS and B.Sc. students of chemistry and biochemistry in May.

Recruitment of student and practising chemists provides considerable scope for initiative by our 6 Branches ranging from 130 to 400 in number of members.

1985 Council Meetings. May 16th and November 5th were fixed as the dates for telephone meetings of Standing Committee and August 25th for Council's meeting in Christchurch.

ICI Fire. Council received with appreciation a letter from Mr R.H. Hoppood, an Auckland corresponding member of the Hazardous Chemicals Committee, setting out seven issues for NZIC arising from the fire at Mt Wellington Warehouse of ICI NZ Ltd on 21st December 1984.

An invitation has subsequently been received from the Commission for the Environment for the Institute to assist a team it has set up to co-ordinate various investigations and reviews of this fire. It is proposed to accept this invitation.

Ties and Scarves. Council reminds members that these are now available from Branch Secretaries.

INTERNATIONAL CHEMISTRY:

1985 NZIC-RACI Visiting Speaker. Dr C.S. Barnes of Biotechnology Australia Ltd, Sydney, was awarded the NZIC-RACI Visiting Speaker award. It is hoped Dr Barnes will visit Branches during June.

FACS Foundation Lectureship. Council and Branches were advised that NZIC has been asked to nominate not more than two chemists for a foundation lecture to be delivered in Seoul, Korea, at the Asian Chemical Congress in 1987, before 31st March 1985.

Eminent chemists who are still active are eligible. FACS will provide a return economy ticket together with US\$25 per day. The Korean Chemical Society will provide hospitality in Seoul.

ACS-NZIC Exchange. Dr D.E. Wright reported to Council his talks with the President and officers of the American Chemical Society in Washington, and on his visits to several ACS sections. It was resolved to establish formally a visiting speaker exchange between the ACS and NZIC. Dr Wright handed to the General Secretary three kilograms of ACS pamphlets about the Society's many programmes for the training and continuing education of chemists. **Chemistry in Sri Lanka.** The first issue of "Chemistry in Sri Lanka" was received by the General Secretary in March. This publication of the Institute of Chemistry, Ceylon, is to appear twice a year.

J. Rogers, Honorary General Secretary
8 March 1985

MEMBERSHIP:

The following applications and changes of status were approved:

Honorary Fellowship:
Llewellyn Donald Rees

Fellowship:

COSGROVE, Mark McElroy MSc(Well), Hamilton Teachers' College, Hamilton (Principal Lecturer in Science).

HERD, Antony Charles BSc(Hons), PhD (Otago), Auckland Technical Institute (Snr Lecturer).

Membership:

CORNISH, Barry Donald BSc(Hons)(Well), Chemistry Dept Victoria University (PhD student).

EADE, Lloyd Mons MSc(Cantuar), Shell Oil (NZ) Ltd, Petone (Analyst).

FORSTER, Lynn Irene BSc, TELARC, Auckland (Technical Advisor).

GIVEN, Nigel Kingsley MSc(Auck), East Malling Res. Stn., Maidstone, Kent (Scientist, Horticultural Res. Centre, Levin).

GROVES, Alan Geoffrey MSc(Cantuar), Ellesmere College, Leeston, Canterbury (H.O.D. Science).

KNAPPSTEIN, Robert James MSc(Auck), Diversy (NZ) Ltd, Auckland (Technical and Production Manager).

LAWTON, Margaret Elizabeth BSc(Hons) (Cardiff), PhD(London), Chemistry Divn, DSIR, Auckland (Scientist).

McKENZIE, Lindsay Ronald NZCS, BSc, Southland Catchment Board, Invercargill (Snr Water Resources Officer).

SCOTT, Lawrence Francis NZCS, NZED, New Plymouth (Chemical Officer).

SKIPPER, John Leslie MSc(Cantuar), Canterbury Frozen Meat Co Ltd, Belfast (Chemist).

Associate Membership:

KENNY, John Patrick (NCEA Biochem and Anal Chem) AMI Biol(Ireland), Southland Co-op Phosphate Co Ltd, Invercargill (Works Chemist).

Technician Membership:

ANSCOMBE, Phyllis Kay NZCS, Auckland City Council (Dangerous Goods Inspector).

Graduate Membership:

HARDIE, Graeme Maclean NZCS, BSc, Chemistry Dept, Victoria University (MSc student).

Graduate to Membership:

BAGGEN, Eric Frank BA, BSc, Davis Gelatine (NZ) Ltd, Auckland (Adhesives Chemist).

EVANS, Susan Mary BSc, DipTchg, DipSc (Otago), Press Research Bureau, Wellington (EDP Manager).

FARR, Lynette Mary BSc(Hons)(Cantuar), Chemistry Division, DSIR, Christchurch (Scientist).

KENNEDY, James Alexander BSc(Hons), PhD (Cantuar), Dept of Chemistry, University of Alberta, Canada (Post-Doctoral Fellow).

KNIGHT, John Stephen BSc(Hons)(Cantuar), Chemistry Dept, University of Canterbury (PhD student).

McCOMBS, John Douglas MSc(Cantuar), Chemistry Dept, University of Canterbury (PhD student).

MILLS, Geoffrey Newton MSc(Waikato), Chemistry Dept, University of Waikato (Jnr Lecturer).

WALSH, Kevan Arthur John MSc(Waikato) Chemistry Divn, DSIR, Auckland (Scientist).

WIGNALL, Anne Philippa Dorothy BSc, Invercargill Girls High School (Teacher).

YAP, Tho Man BSc(Hons), PhD(Otago) 43 Groom St, Hughes, Canberra, Australia (unemployed).

Resignations:

L. Sew Hoy (Canty), K.H. Yeo (Canty).

Re-instatement:

M.S. Greig (Auck), G.D. Edwards (Canty).

Life Membership:

P.L. Chappell, Dr A.J. Huggill, Prof P.B. De La Mare (Auckland); R.M. Greenwood (Manawatu); B.M. Stedman, Prof J. Vaughan, Prof B.H. Howard (Canterbury); L.C. Baker (Otago); G.F. Martin (Overseas).

UNIVERSITIES AND TECHNICAL INSTITUTES

Auckland

Dr R.N. Seelye has retired from the Department of Pathology, in the School of Medicine.

Dr Seelye graduated from Victoria University in 1942, worked for three years with the Dept of Agriculture, then moved to the Chemistry Dept, Auckland University. Here he spent the next 19 years, apart from a 3 year stint at Oxford (1959-61) leading to the D.Phil degree. The period 1964 to 69 was spent in the Cancer Research Laboratory in Auckland, and in 1970 he joined the Department of Pathology. In this position Dr Seelye's research was directed at heart disease, and prior to retirement he was studying the fate of ATP metabolites during oxygen deprivation of heart muscle, and the means of restoring the adenosine pool on reoxygenation.

Prof J.P. Collman of Stanford University, California, is visiting the Chemistry Department, where he will be working with **Prof W.R. Roper**. His interests are biomimetic and metalloporphyrin chemistry.

Prof M. Herberhold from the University of Bayreuth, Germany, is also visiting Prof Roper. His interest is in organometallic chemistry involving sulfur, selenium and tellurium compounds.

Prof T. Rauchfuss from the University of Illinois is visiting the Chemistry Department until May, and will be working with **Dr George Clarke**. His interest is synthetic inorganic chemistry.

Waikato

We are pleased to welcome **Mr Geoffrey Mills**, who joined the department in January as a Junior Lecturer. Geoff had previously been working with the DSIR Water Laboratory in Christchurch.

Also new to the department is **Ms Valda Kirkwood**, who in January took up a Teacher Fellowship, and will be working with **Dr Malcolm Carr** on the preparation of internal assessment material for laboratory work which will possibly accompany the new 7th form prescription.

Massey

Dr Neil Waters, Vice-chancellor of the University has been appointed Chairman of the New Zealand Vice-Chancellors' Committee for a two year term.

Dr Ian Watson of the Department of Chemistry and Biochemistry has been elected to the Massey University Council by the academic staff of the University.

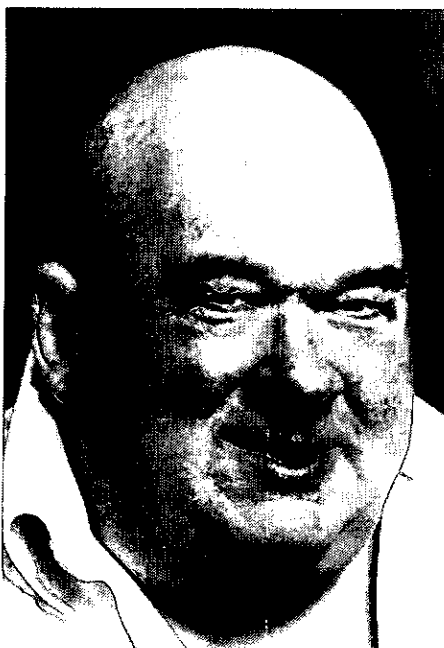
Until the beginning of 1985, physics and biophysics were taught in the then Department of Chemistry, Biochemistry and Biophysics. These subjects are now taught in the new Department of Physics and Biophysics with **Professor Paul Callaghan** as the Head of Department. The Department has eight academic staff, including **Professor David Parry** who was honoured with his appointment to a personal chair, two technicians and a secretary. Teaching and research facilities for the Department are located on the top floor of the new science tower (number four). Professor Callaghan, who joined the staff of Massey University in 1975, is recognised internationally for his work on experimental molecular physics using nuclear magnetic resonance.

Victoria

The year 1985 sees the retirement of **Professor J.N. Smith**, of the Biochemistry Department at Victoria University of Wellington. Professor Smith leaves after 20 years at Victoria. He was the first full Professor of Biochemistry at V.U.W., joining the Chemistry Department in 1964 and leading an independent Biochemistry Department from 1969.

His University career began at Liverpool where he obtained a B.Sc. in chemistry and an honours degree in biochemistry. World War II interrupted his studies. He served as a navigator with Bomber Command. After the war he returned to Liverpool University to carry out research for his Ph.D. His work concerned the elucidation of conjugation mechanisms involved in the detoxication of aromatic amines. He was supervised by R.T. Williams, the outstanding authority on detoxication.

After completion of the Ph.D. degree he went with Williams to St. Mary's Hospital Medical School, London as an assistant lecturer. He remained there, attaining the rank of Senior Lecturer, before accepting the chair at Victoria in 1964.



Professor Smith created a profound impression at Victoria University by his dedication to research. His enthusiasm for his chosen field of the comparative biochemistry of detoxication led him to examine the metabolic processes whereby pesticides and other foreign compounds are rendered innocuous in a vast range of animals. These studies were carried out in insects (he has been described as one of the founding fathers of insect toxicology), fish, marine invertebrates, lizards and some more exotic creatures such as peripatus and tuatara. This work was central to the formation of views on the evolution of detoxication mechanisms.

Professor Smith was the foundation Chairman of New Zealand Biochemical Society and was the first Professor of Biochemistry in the country to be elected to fellowship of the Royal Society of New Zealand.

Central Institute of Technology

Dr R. Ledger has returned to the School of Pharmacy after 21 months working at the University of Iowa where he was a research associate and visiting Professor studying Protein folding and Receptor Interactions using hydrodynamic (HPLC) methods.

Canterbury

Dr John Blunt attended the NMR '85 Conference in Terrigal, New South Wales, February 17-20.

Dr Ward Robinson is an invited lecturer at the Crystal XV Conference, Glenelg, South Australia, May 12-16. **Dr Vicki McKee** will also be attending the conference.

Professor Thomas Meyer from the University of North Carolina at Chapel Hill will be visiting the Chemistry Department as an Erskine Fellow, May-July. Professor Meyer is an inorganic chemist with research interests in photochemistry and electron transfer reactions.

Otago

Professor Dieter Hummel from the Institute for Physical Chemistry, University of Cologne, FRG, visited the Textiles Department in February, when he presented a lecture to the Textiles and Chemistry Departments entitled, "Linear temperature controlled pyrolysis mass spectrometry of co-polymers". He was en route for home after attending the Polymer Symposium in Melbourne.

Dr Graeme Searle arrived in the Chemistry Department in February. Graeme is a Senior Lecturer from the University of Adelaide, and will be working with **Prof David Buckingham's** Group until May, sharing an interest in coordination chemistry. **Dr Peter Carpenter**, from the Marine Chemistry Laboratory, University of Melbourne, will arrive in May to spend a year working as a U.G.C. Postdoctoral Fellow with **Dr Keith Hunter**.

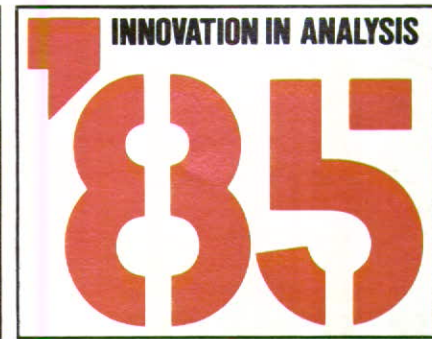
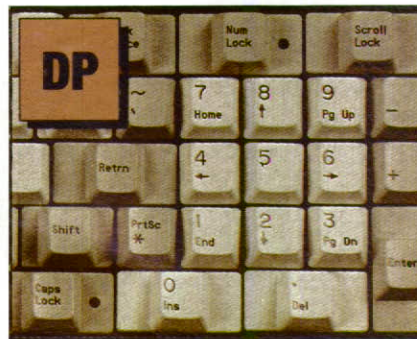
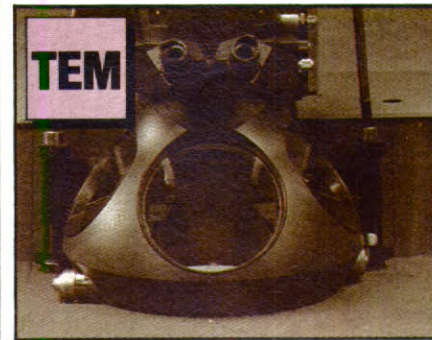
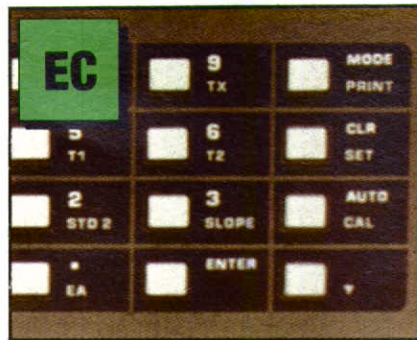
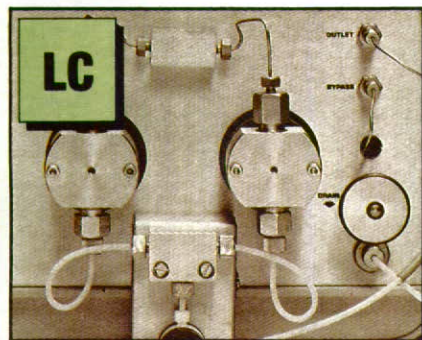
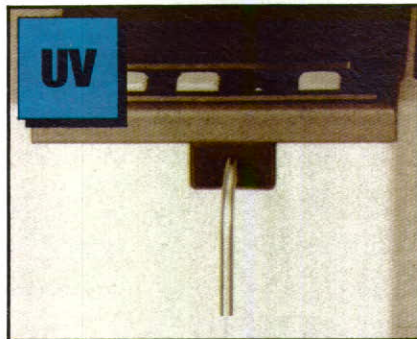
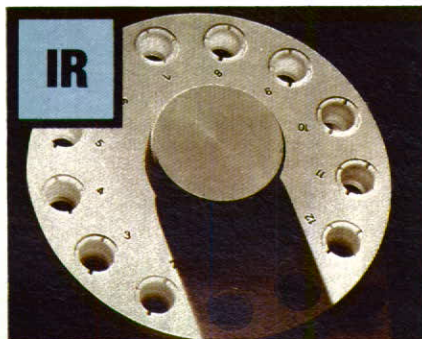
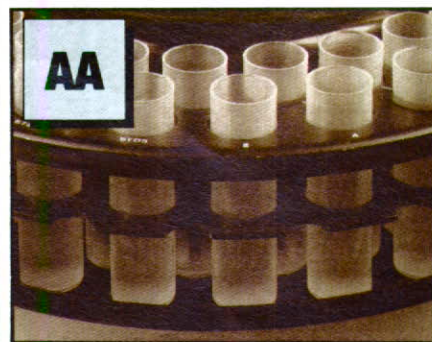
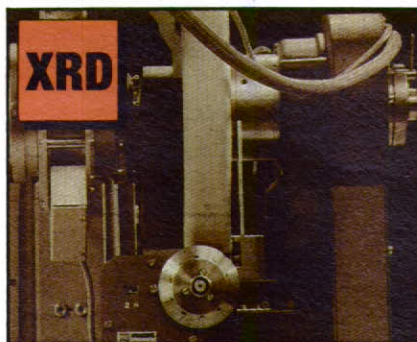
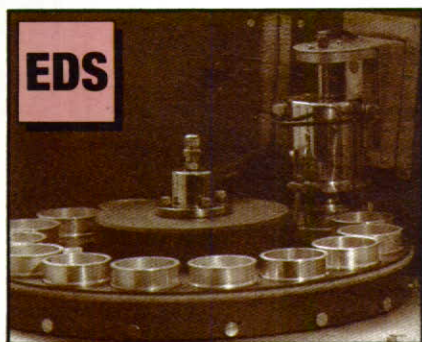
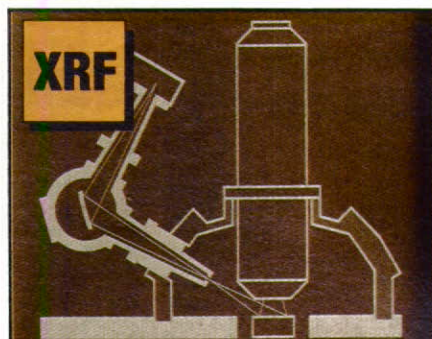
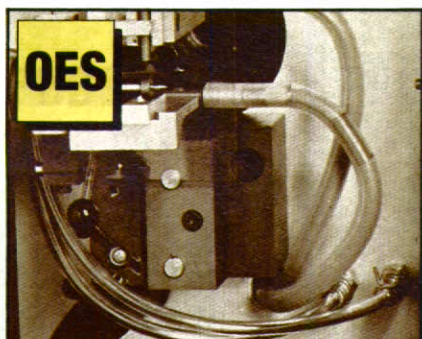
Prof Buckingham's Group have recently purchased and installed an Olis rapid scan data acquisition system which is capable of recording a 100 point spectrum scan in 3.8 milliseconds. This will facilitate the detection and observation of transient intermediates in stopped-flow studies. The Marine Chemistry Section, in conjunction with the Botany and Zoology Departments, has recently taken delivery of a Chem Lab 4 continuous-flow analyser. This will analyse for phosphate, nitrate, silica and ammonia in fresh and sea waters at the rate of 30-60 samples per hour.

Margaret Leonard, who recently graduated M.Sc., is now with the Otago Catchment Board's Water Quality Laboratory in Dunedin. **David Hawke**, M.Sc., has been awarded a U.G.C. Scholarship and will be returning to study marine phosphates for Ph.D. studies. **Dr Allison Downard** has gone to the University of Southampton, England, to work with Dr Derek Fletcher in the Electrochemical Group.

In the Pharmacology Department, **Prof Ralph D. Tanz**, from the Oregon Health Sciences University, Portland, visited in February and spoke to the Department on "Cardiac glycoside induced toxicity". **Prof Otmar Wasermann**, a toxicologist from the University of Kiel, FRG, has now departed after spending six months leave in the Department. **Dr N. Bowery**, the 1984 British Pharmacological Society Visiting Lecturer from St. Thomas's Hospital Medical School in London, visited in December and lectured on "Gamma amino butyric acid in the brain". **Dr D.P.L. Green** has been awarded a grant from the Ministry of Agriculture and Fisheries to study gene injection into normal eggs.

Hartley C. Atkinson has recently completed an M.Pharm. degree with distinction in Pharmaceutical Chemistry in the Pharmacy Department. He has now joined the Dept. of Clinical Pharmacology at Christchurch Hospital where he will study for a Ph.D degree.

PHILIPS ANALYTICAL PRODUCT REVIEW



Analytical
Equipment

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NEW CHOICE FROM PHILIPS

Take a look at the superb range of Philips Analytical products for 1985 and you'll see true innovation in analysis.

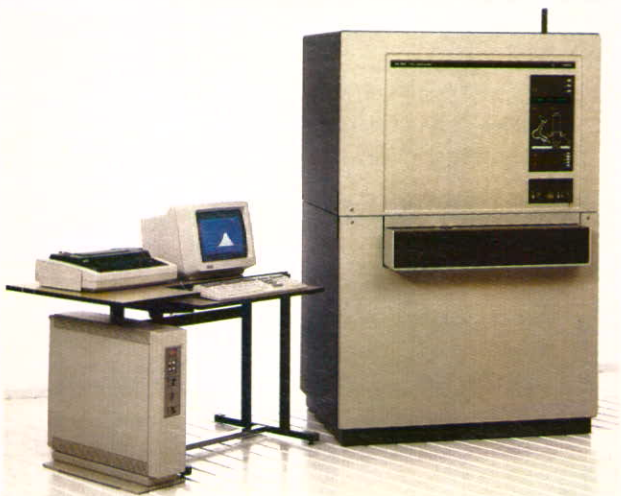
We're proud to present greater choice and higher quality than ever before, with the introduction of no fewer than 15 new products emphasising the dedication of Philips approach to innovation through constant research and development.

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PW 1404 sequential x-ray spectrometer. Combines the outstanding performance and simple operation of the renowned PW 1400 with a number of major improvements. **Reader inquiry no. 550**



PW 1606 simultaneous x-ray spectrometer Another state-of-the-art development of a highly successful series, the PW 1606 is ideal for fast, routine analytical control in industry. **Reader inquiry no. 551**



PW 1840 compact analyser This latest addition to the x-ray diffraction range is a safe, economic bench top instrument, ideal for many routine applications. **Reader inquiry no. 552**



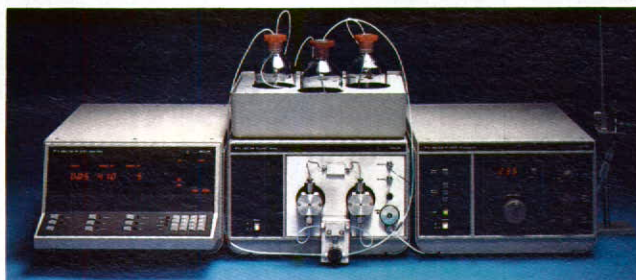
SEM 515, 525, 535 scanning electron microscopes

A new family of advanced research SEMs offering a choice to meet the growing demand for specialist instrumentation. **Reader inquiry no. 553**

PV 9900 microanalytical system

A remarkable combination of EDAX's highly regarded light element detection capability and the latest image analysis techniques.

Reader inquiry no. 557



PU 4000/4003 low dispersion liquid chromatograph

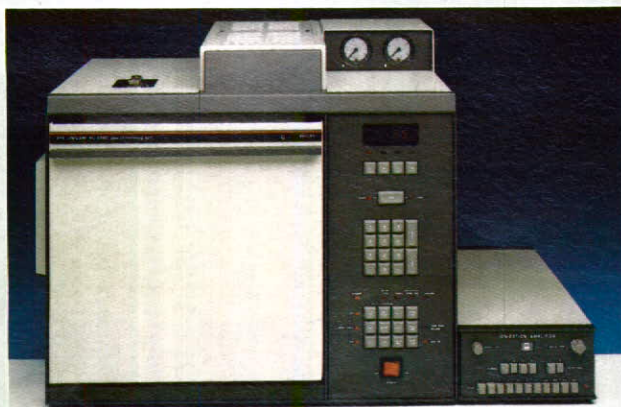
Specially designed precision isocratic and gradient systems for use with Microbore and FAST as well as conventional columns. **Reader inquiry no. 554**



PV 8050 emission spectrometer family

High performance across a very wide range of analytical programs is provided by these new emission spectrometers. ICP or combined spark-ICP sources are among the options.

Reader inquiry no. 558



PU 4550 gas chromatograph

A versatile design available with an exceptional range of options virtually guarantees the right configuration for any GC application. **Reader inquiry no. 555**

PU 4900 total analytical gas chromatography system

A new, integral, systems approach to chromatographic analysis which uses Total System Power to achieve optimal performance as a matter of routine.

Reader inquiry no. 556

Conductivity meters

Three new high quality digital models offering microprocessor accuracy, conventional simplicity or portability for field use. **Reader inquiry no. 559**

PW 9419/10 portable pH/mV meter

A lightweight, hand-held digital meter, complete with carrying case. Combines accuracy with toughness.

Reader inquiry no. 560

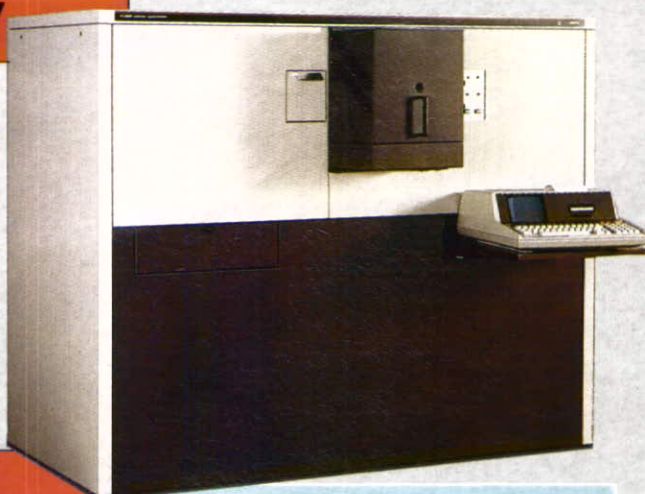


EMISSION SPECTROMETRY

Similarly advanced technology to that found in the new PV 8050 emission spectrometers is employed in the PV 8020 compact range.

Models for the iron and steel industries are enjoying phenomenal success in foundries and factories throughout the world.

Reader inquiry no. 561



X-RAY SPECTROMETRY

The PV 9500 from Philips is an integrated energy dispersive system giving fast, non-destructive multi-element analysis at a practical price.

It can be supplied in qualitative or full quantitative form and with a number of specialist software packages.

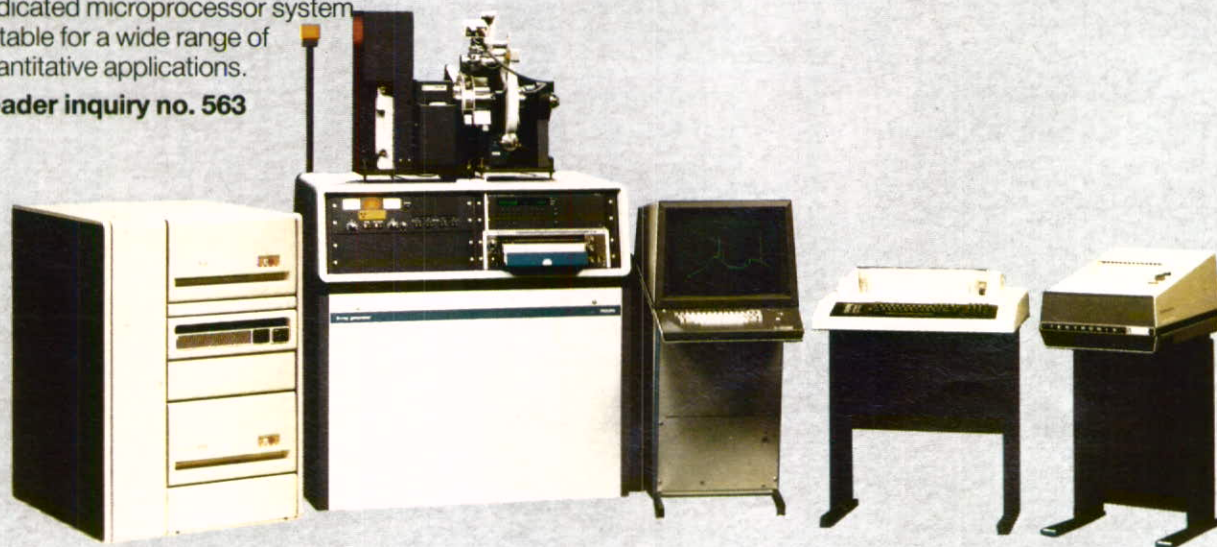
Reader inquiry no. 562



X-RAY DIFFRACTION

The new PW 1840 joins the world's premier x-ray diffraction range. It already contains such instruments as the PW 1700, the most advanced automated powder diffraction system available, and the PW 1710, a dedicated microprocessor system suitable for a wide range of quantitative applications.

Reader inquiry no. 563



AA SPECTROPHOTOMETRY

SP9 modular flame and furnace AA systems offer hundreds of permutations and the opportunity to benefit from major advances like the Totally Pyrolytic Cuvette and Slotted Tube Atom Trap.

Reader inquiry no. 564

PU 9000 is the world's only intelligent multi-element AA spectrophotometer. It can even optimise conditions for elements without operator involvement, but with complete accuracy.

Reader inquiry no. 565



IR SPECTROPHOTOMETRY

A viable and highly competitive alternative to the traditional choice does exist in infrared – the range of spectrophotometers, data systems and Library Search software from Philips Analytical.

Half wavenumber resolution is now among the options for the programmable PU 9510/20 spectrophotometers. The range also includes the SP3s – low cost, yet with true ratio recording.

Reader inquiry no. 566



UV/VISIBLE SPECTROPHOTOMETRY

Check the value offered by the Philips Analytical UV/VIS range.

The single beam PU 8600 series now embraces four microprocessor instruments all offering a list of benefits no competitor can approach. Research performance and video technology combine in the double beam PU 8800 to give a unique blend of analytical power, versatility and ease of use.

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PHILIPS ANALYTICAL OFFERS MORE CHOICE

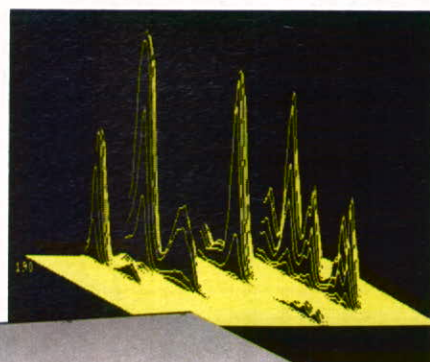
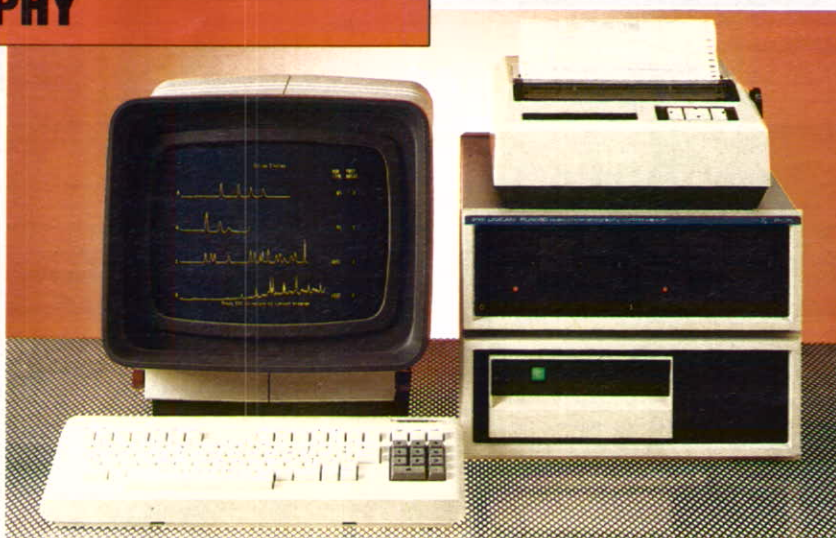
CHROMATOGRAPHY

In addition to the new PU 4900 and PU 4550 gas chromatographs already shown, Philips offers a wide choice of PU 4500s, attractively priced for routine general or specific applications.

The liquid chromatography range also includes the PU 4002, an exceptionally powerful methods development liquid chromatograph; a Diode Array Detector and LC Data System with high resolution graphics; data stations and integrators; LC detectors and an auto-injector.

A custom-building service meets the growing need for factory engineered automated systems.

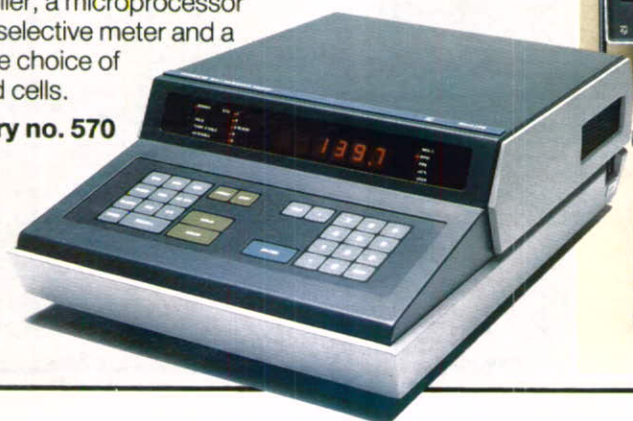
Gas chromatography
Reader inquiry no. 568
Liquid chromatography
Reader inquiry no. 569



pH, CONDUCTIVITY, ION SELECTIVE

The Philips range for 1985 includes digital and analogue pH meters, the three new conductivity meters mentioned earlier, a microprocessor controlled ion selective meter and a comprehensive choice of electrodes and cells.

Reader inquiry no. 570



ELECTRON MICROSCOPY

Philips new scanning microscopes, already mentioned, are appropriate counterparts to the range of three specialist transmission instruments, the EM 410, 420, and 430.

This superb trio is now recognised as the standard for the technique and caters for applications involving the life sciences, comprehensive analysis and fundamental research.

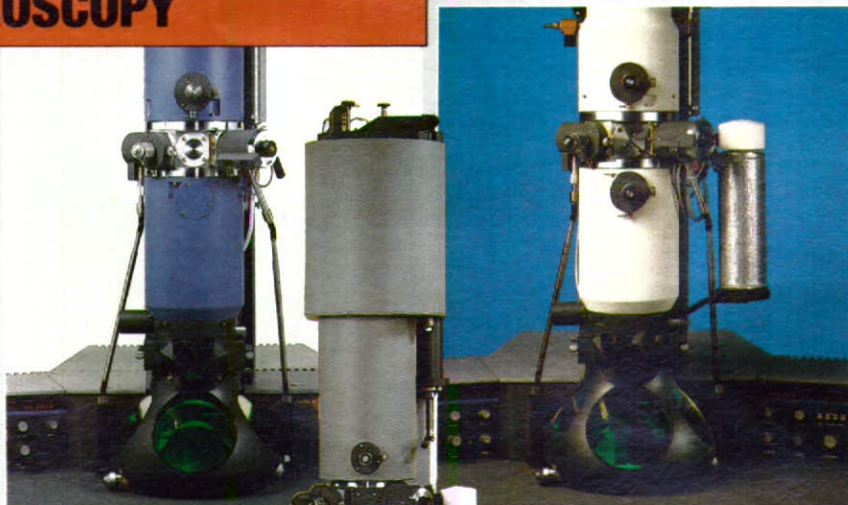
Reader inquiry no. 571

MICROANALYSIS

The new PV 9900 microanalyser from EDAX joins the established PV 9100, a modular system with full colour graphics designed to analyse all elements of the periodic table from sodium to uranium or boron.

Options include wavelength and electron energy loss spectrometry and the EDAX range of detectors.

Reader inquiry no. 572



ANALYTICAL DATA PROCESSING

The new P3100 provides everything you would expect from the world's leading personal computer – and more. The P3100 controls and manipulates data from a variety of Philips instruments and runs an enormous range of IBM-compatible software.

Reader inquiry no. 573



FREE PUBLICATIONS FROM PHILIPS

1985/86 Analytical Catalogue

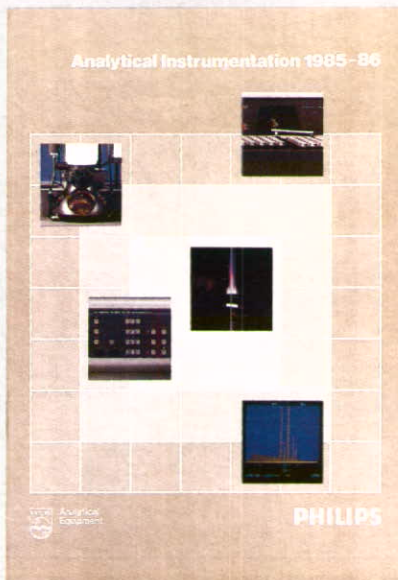
Revised and updated to include details of all the latest instruments, this popular guide to the complete Philips Analytical range is now available on request.

Reader inquiry no. 574

Analytical Bulletin

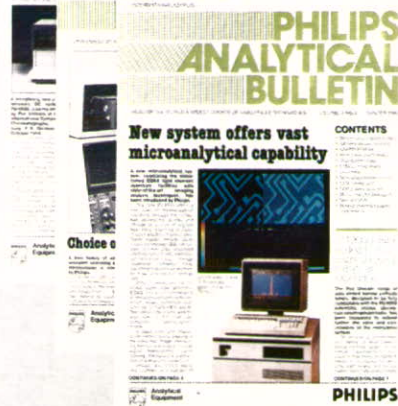
The vast world-wide circulation of Philips Analytical Bulletin is a fitting tribute to the volume and variety of information it contains on products, literature and international events. Published four times a year, with occasional supplements.

Reader inquiry no. 575



CHROMATOGRAPHY SUPPLEMENT

ANALYTICAL ELECTRON MICROSCOPY



SERVICES

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Analytical
Equipment

PHILIPS

GOVERNMENT DEPARTMENTS

DSIR

NZ Soil Bureau

Mr L. Searle recently spent ten weeks visiting the USA, Canada and Europe. In the USA Mr Searle spent a month at the Massachusetts Institute of Technology working with Professor H. Hemond in the Ralph M. Parsons Laboratory on a research proposal for the Environmental Protection Agency. This project involved an investigation of the role of soil chemistry in the biogeochemistry of a catchment ecosystem in Massachusetts.

Chemistry Division, Auckland

The death of **Celia Kahukura** in February came as a great shock to many in the profession. Celia graduated NZCS in chemistry in 1984. She was an extremely able student and was awarded the New Zealand Institute of Chemistry prize for the highest marks in Chemistry V 1983, the Douglas Boulton Memorial Award for science technician of the year 1983, the New Zealand Association of Scientists award for the highest marks in Stages III, IV and V of any technical institute course leading to a New Zealand Certificate in Science.

Chemistry Division, Wellington

W.A. Joiner, Director of Chemistry Division from 1946-47, and Assistant Secretary of the DSIR until he retired in 1964 died recently.

R.A. Kennerley, who retired from Chemistry Division in 1983, is now Technical Manager for NZ Cement Holdings Limited.

M. Rose has resigned from the Solid State Section to work for a ceramic manufacturing firm in Auckland.

M. Dale, who has been working in the Inorganic Materials Section for the past year on secondment from Ceramco (NZ) Ltd has returned to Ceramco in Auckland. Mr Dale recently gained the Laurie Buckley award as the best Management Cadet for Ceramco.

Dr L.J. Porter has relinquished the post as Organic Section head on his return from California. The new section head is **Dr A.D. Woodhouse** who was acting section head during Dr Porter's absence.

Professor A. Williams-Jones from McGill University, Montreal in Canada is currently visiting the Geochemistry section where he is working on high temperature aqueous solution chemistry.

Professor D.E. Irish from the University of Waterloo in Canada is also spending sabbatical leave in the Geochemistry section working on high temperature electrolyte solution chemistry.

Dr R. Krupp from the University of Mainz in West Germany is visiting Chemistry Division on an Alexander Van Humboldt Fellowship to work on geothermal chemistry.

Chemistry Division, Christchurch

Dr Chris Noakes has been appointed to the Water Section.

Dr Richard Grasse resigned in February and left on a projected nine month tour of Asia that will eventually take him to England. He has been replaced by **Ian Rowlands**.

Dr Lewis Pannell visited us in February and presented two seminars on his work and other activities in and around NIH in Bethesda, Maryland.

Dr Peter Meredith went to Hobart in Tasmania in February to attend a potato conference and then plans to visit other parts of Australia to investigate the potato scene there.

APPLIED BIOCHEMISTRY DIVISION

Dr Graeme Russell has returned to the Division after spending 10 months at the Chemistry Department, University of Southampton,

on a SERC Visiting Fellowship.

The Biochemical Processing Centre hosted a two-day conference entitled: "Opportunities in Biochemical Processing" on 19 and 20 February at Massey University. The programme for the first day consisted of a series of lectures and discussion periods, while on the second day there were two symposia entitled "Enzymes in Biochemical Processing" and "Biochemicals from Animal Products".

FOREST RESEARCH INSTITUTE

Dr K.L. Mackle has returned from 9 months with Forintek Canada Corp. at Vancouver. He was doing further work on biomass conversion, specifically steam pretreatment of hardwoods and softwoods. This involved assessing the effectiveness of added acid catalysts in improving the enzymatic digestibility of the products produced. He will also be installing steam explosion equipment at the FRI in the near future and plans to extend his current work to include studies on the chemical changes of individual wood fractions during steam pretreatment.

An international symposium on "The pretreatment of lignocellulosic materials" will be held at FRI on 25-29 March 1985. Guest speakers from Australia, USSR, West Germany and France are expected as well as participants from other countries.



Dr J.A. Zabkiewicz has returned from a six week visit to the UK, Europe and the USA after receiving a Royal Society of NZ Prince and Princess of Wales study award. He participated initially at a conference in Reading University on "Application and Biology of Pesticides" organised by the British Crop Protection Council. This was followed by visits to various institutes, universities and companies to study techniques, ideas and instrumentation relevant to current and future studies at FRI on herbicide uptake in relation to formulation and application.

FRI has taken delivery of a Bruker AC-200 NMR spectrometer. The console is up and running but final commissioning is dependent on the departure of the carpenters, plumbers, etc still co-occupying the laboratory.

The first (for FRI) chemistry PhD student, **Richard Ede** has joined the staff. He is jointly supervised by **Drs L. Main and A. Wilkins** of Waikato University and **Dr J. Ralph**. His topic is to extend the understanding of anthraquinone accelerated delignification of wood using lignin model dimers, and the new NMR will play a large part in his work.

N.Z. DAIRY RESEARCH INSTITUTE

Mr Dave Munro left the Institute on February 26 to join the Rangitaiki Plains Co-op Dairy Co. His position as Head of the Milkfat and Butter Section has been taken by **Dr Robert Norris** who has been seconded to the N.Z. Dairy Board.

Mr John Aston, from the Otto Madsen Dairy Research Laboratory, Queensland, is to spend a year working with **Dr Lawrie Creamer** on aspects of cheese maturation. He will arrive in Palmerston North in late May.

Dr Audrey Jarvis is on study leave at the University of North Carolina. **Dr Graham Davey** is on leave at NIH in Washington, D.C., and will return to the Institute in June.

Mr Alan Baldwin has transferred from Head of the Milk Powder Section to head of the Engineering Services Section. His earlier position has been taken by **Tony Baucke**.

Dr Russell Wilson has joined the Flavour Section of the Institute and will assist with the work on the identification of volatile flavour components of dairy products.

WHEAT RESEARCH INSTITUTE

Tony McLean left in January to go tobacco farming in Nelson. He was replaced by **Mark Van Voorhuizen**.

Alistair Marris also left in January to take up a position with Elastomer Products in Christchurch. He was replaced by **Dr Tim Lindley**.

COURSES

HPLC COURSE

WAIKATO TECHNICAL INSTITUTE HAMILTON 14-16 MAY 1985

This course in basic HPLC is being repeated following the success of the last course in May 1984. It is an introduction to HPLC and requires no previous knowledge of the technique. Lectures will cover: introduction to HPLC theory, columns, detectors and solvent selection as well as practical applications.

The course is very practically based and participants will get 'hands on' experience with a number of different instrumental set-ups. There will be a maximum of 4-5 students per instrument.

Course fee: \$150 (Covers registration, morning and afternoon teas, one evening meal and drinks after work).

Accommodation: \$20/day bed and breakfast WTI Student Hostel (limited no. of places available).

For registration forms contact **Dr P. Robinson** or **Dr W.P. Judd**, Science Dept, Waikato Technical Institute, Private Bag, Hamilton. Phone 392-500.

ACA CERTIFICATE COURSE IN CORROSION TECHNOLOGY

The New Zealand Branch of the Australasian Corrosion Association is organising a course on corrosion technology, covering areas such as the fundamentals of corrosion, corrosion testing, control methods, and specific examples of corrosion protection (e.g. surface coatings, material substitution).

Primarily aimed at the technician level, the course is open to all interested persons, and will be held at the Auckland Technical Institute on Friday afternoons, from 14 June to 16 August, and 13 September to 1 November 1985.

For further information contact **Les Boulton** ([09] 34116) or **Keith Ufton** ([09] 773570) or write to The Education Officer, ACA, P.O. Box 5961, Auckland.

SAFETY

CHEMICAL SAFETY FEATURE

In this issue we start what is hoped will be a regular feature on aspects of chemical safety. For an introduction we look at some of the recent work of the Hazardous Chemicals Committee, the NZIC's official representative on such matters. To support the theme there are also product features on fume cupboards, and other general lab safety equipment. In future issues we will cover subjects such as developments in toxicology, chemical hazards in industry, legislation, storage, laboratory design, chemicals in the environment, and so on. Most of these articles will be contributed at our request by people who we know have particular expertise in the field. Voluntary contributions are also invited, however, and we would also welcome brief notes from members regarding laboratory accidents, safety hints, etc.

Hazardous Chemicals Committee

The Hazardous Chemicals Committee (HCC) was officially constituted by Council in 1978, following on from the earlier work of a subcommittee of the Auckland Branch under the leadership of the late Arthur Kennett. The committee is now based in Dunedin under the chairmanship of Dr Wayne Temple, Scientific Director of the National Poisons Information Centre. As with other Council Committees the local membership is supported by corresponding members from each of the other Branches.

The formation and early work of the HCC was described in the 1980 Yearbook, and in Chemistry in NZ, 46, 136 (1982). Generally, the committee has been involved in providing comments on proposed legislation and government regulations, and liaison with organisations such as SANZ. Promotion of the expertise available within NZIC is a major theme in the committee's work.

In 1984 the HCC was instrumental in arranging the visit to this country of Mr Les Bretherick, a leading chemical safety expert. The visit was jointly sponsored by NZIC and the Accident Compensation Commission. Mr Bretherick presented a number of lectures to a variety of audiences throughout the country, including Institute members, representatives of ACC and the Fire Services, industrial safety officers, and members of the transport industry.

Another recent activity has involved input to the Auckland Regional Authority (ARA) in its considerations of hazardous activities in the region. In 1982 the ARA called for submissions on this subject, and the NZIC was amongst the 50 or so organisations and individuals that responded. The ARA planning department subsequently prepared a 250 page report, "Planning for Hazardous Activities in the Auckland Region", which focussed on activities capable of causing large scale harm to communities or substantial parts of the region through the release of large concentrations of energy, toxic substances, or dangerous micro-organisms. Written comments on this report were sought by ARA, and the HCC was again happy to contribute. In addition, Mr Raymond Hoppood, an Auckland corresponding committee member, represented the NZIC at a forum to discuss the report and subsequent submissions.

In its submissions, the HCC commented that it felt the report provided a readable, readily understood and comprehensive survey which should provide a valuable basis for discussion. Errors of fact and conflicting remarks were pointed out, and it was felt that at times the authors of some of the sections had shown unreasonable bias towards particular points of view. These comments were supported by

other representatives at the forum. The HCC also reiterated a previous recommendation that the ARA join with NZIC in urging Government to hasten the introduction of further appropriate legislation to control the transport, storage and disposal of hazardous substances.

The forum was held in May 1984, and a report presented to the ARA in September. Unfortunately the matter appeared to lapse for a while due to budgetary constraints within the Authority. It received new impetus earlier this year, however, when the fire at ICI's warehouse in Mt Wellington clearly demonstrated some of the possible problems that had been highlighted in the initial report. The Institute did not take any part in the events immediately following the fire, feeling that there were enough groups on the "band-wagon" already. However, a report was presented to Council, again by Raymond Hoppood on behalf of the Hazardous Chemicals Committee, and it is likely that the incident will serve as a spur for further efforts to improve legislation in this area.

Bruce Graham

GENERAL NEWS

POST GRADUATE FELLOWSHIP IN SOIL SCIENCE

Lincoln College, Canterbury, has an immediate opening for a chemistry graduate to study the interaction of humic substances with inorganic soil components, leading to a Ph.D degree.

The project is sponsored by the Department of Scientific and Industrial Research through a 3-year research contract to Canterbury University.

For further information please contact Professor R.S. Swift, Department of Soil Science, Lincoln College, or Dr B.K.G. Theng, N.Z. Soil Bureau, DSIR, Lower Hutt.

ANATECH — GRAYSON MERGER

Bill Grayson, of W. Grayson and Associates, advises that his company has taken over the operations of Anatech, forming a new company to be known as Anatech and W. Grayson. Prior to the merger W. Grayson and Associates had been concentrating on product development work, and industrial troubleshooting, and this should combine well with the wide range of testing and analytical services provided by Anatech.

ECOLOGICAL SOCIETY

THE ENVIRONMENTAL CONSEQUENCES TO NEW ZEALAND OF NUCLEAR WARFARE IN THE NORTHERN HEMISPHERE

The Council of the New Zealand Ecological Society has undertaken an assessment of the scientific evidence on the environmental consequences to New Zealand, of nuclear warfare in the Northern Hemisphere. Its conclusion, in a report published December 1984, is that even a small-scale nuclear war confined to the Northern Hemisphere will have far-reaching and, in some cases, unpredictable consequences for the New Zealand environment. The Council now believes it cannot continue to promote concern for the New Zealand environment and yet remain silent over the threat to

world ecosystems posed by nuclear armaments.

The Council's report, which summarises published information available up to July 1984, is described as an apolitical expression of concern. It seeks to convey to a wider audience the likely effects of a Northern Hemisphere nuclear war on the New Zealand environment, and to identify issues requiring action within New Zealand. In particular, the following points are highlighted:

1. The likely effects on plants and animals (including humans) and their ecological relationships, of a nuclear war fought in the Northern Hemisphere, are being increasingly researched and documented. As computer models of climatic and biological relationships are improved, the physical and environmental consequences of a nuclear war are shown to be increasingly devastating and to extend worldwide.
2. Consequences within the Northern Hemisphere are receiving the most attention. The likely effects on Southern Hemisphere life of a northern nuclear war is little researched or understood and most comment is derived by simple extrapolation from predicted Northern hemisphere events.
3. Most research has centred on the immediate human plight rather than the consequences for the global environment and the life forms upon which humans depend for their survival.

It is apparent that, for communities of plants and animals in both terrestrial and aquatic environments, nuclear war will cause enormous disruption. Ecological relationships are so complex that ecologists cannot anticipate all the likely outcomes. However, extended darkness, reduced temperatures, and high levels of radiation damage would see photosynthesis effectively prevented, food chains disrupted or collapsing thus progressively pushing species to low numbers, and then to extinction. The final toll of individuals would be uncountable; the number of species lost could reach the tens of thousands, especially in the tropics. New Zealand would not be immune to many of these consequences.

In its conclusion to the report the Council makes the following recommendation:

"that the Government:

- (i) supports and finances the direct participation of New Zealand scientists in regional and global efforts to develop a better understanding of the environmental consequences of nuclear war. New Zealand researchers in the biological, agricultural, medical, and physical sciences could make important contributions to existing, and future, international efforts;
- (ii) establishes an expert task force, which would utilise expertise from natural, physical, medical and social sciences, as well as agricultural, manufacturing and service sectors, to evaluate the likely consequences for New Zealanders and the New Zealand environment of nuclear war in the Northern Hemisphere. The work and report of the task force could raise public awareness of the issues, stimulate debate over our national options, and promote pertinent research."

It is the Council's hope that after reading and discussing their statement, other groups such as NZIC would feel able to publicly endorse it. Furthermore, it is hoped that the document will act as a stimulus for other groups to likewise contribute in their own fields of expertise, to the pool of information needed for informed public debate.

Copies of the report are available from the NZ Ecological Society (Inc), PO Box 12-019, Wellington.

Ed.

BOOK REVIEWS

BOOK REVIEW

"pKa — prediction for Organic Acids and Bases." by D.D. Perrin, Boyd Dempsey, and E.P. Serjeant. Chapman and Hall: London 1981. X + 146pp. ISBN 0-412-22190-X.

That "The Determination of Ionisation Constants" by A. Albert and E.P. Serjeant (1971) is one of the most widely quoted texts in chemical literature is evidence of the importance of the acid-base properties of organic compounds. Ionisation constants are important quantities in analytical chemistry, organic chemistry and pharmaceuticals amongst other areas. The experimental measurement of ionisation constants is often inconvenient or impracticable, and, although several extensive compilations of experimental pKa's exist, the pK for a compound of interest is most likely not available. This book describes methods of predicting an approximate pKa, which is often adequate for the experimentalist's needs. The precision of such a predicted value (within several tenths of a pH unit) may be suitable for recording spectra as a pure species, the selection of solvent extraction or chromatographic conditions, acid base catalysis and reaction kinetics, for example.

Effective estimates for pKa values are based upon assumptions, depending upon the class of acid or base, that substituents produce free energy changes which are linearly additive. These linear free energy relationships provide the basis for the Hammett and Taft equations, which are the most widely used methods of prediction. The use of these equations is described for many systems. Tables include extensive lists of Hammett and Taft substituent constants, and guides are suggested for estimating unknown constants. These features are exceptionally useful to the reader and enable pK predictions for complex molecules e.g. morphine (predicted by reviewer pKa1, 8.8, pKa2 9.6; experimental pKa1 8.3, pKa2 9.5). Considering that morphine is ampholytic and zwitterion formation must be taken into account for its experimental measurement, this prediction for pKa is remarkable close to that experimentally obtained.

Although this text may be heavy going for those not fully conversant with the various model processes used, its aim, to provide a means of predicting approximate pKa values has been achieved.

P.E. Nelson, Government Analyst,
Chemistry Division, DSIR, Auckland.

Encyclopaedia of the Alkaloids. Vol. 4.
John S. Glasby (ICI Organics Division Ltd.).
Plenum Publishing Corp. New York. 1983
391 pp. \$(U.S.) 65.00
ISBN 0-306-41217-9

This volume is part of a reference work addressed to investigators in the fields of chemistry, botany, medicine, and forensic science. It updates the first three volumes [Vol. 1 (A-H), 1975; Vol. 2 (I-Z), 1975; Vol. 3, 1977] and covers the literature to the end of 1981. It includes those alkaloids which have been discovered since 1977, and also contains a few entries giving recently determined structures or additional information for the odd compound from the preceding volumes.

The substances are listed in alphabetical order, with an average of three compounds to a page. The molecular and structural formulae and the melting point are given, followed by a short paragraph commenting on the occurrence, method of structure determination, and in some cases the optical rotation and ultraviolet spectroscopic data. All entries are referenced. Unlike Vols. 1 and 2, Vol. 4 has a formula index which greatly increases the value of the book as a ready reference.

Although alkaloids are among the most important natural products, information on the multitude of plant bases remains scattered in a wide range of scientific journals. There is a place, therefore, for a convenient reference book of this type, which attempts to update current literature without inordinate delay. The over 1000 entries in the current volume attests to the fact that new alkaloids are still being isolated at a remarkable pace, and present indications are that this situation will not change for some time.

The volumes, as a set, are obviously a useful work of reference and could save the researcher and teacher a great deal of tedious work. The current volume is unlikely to find its way onto many private bookshelves, but it is sure to find a useful place in any chemistry library of note.

R. C. Cambie

Alcohol, Drugs and the New Zealand Driver
Compiled by H. M. Stone Pp 76
(DSIR Bulletin 232, Wellington, 1982)
Paperback \$8 + 36c postage

The principle that some sort of control should be exercised by society over those who drink and drive is now so generally accepted that it is easy to forget how much controversy was generated in the early nineteen sixties by the proposal to introduce such legislation. Even quite major changes to the law, such as the introduction of evidential breath testing, now cause only a temporary disturbance. Occasionally a case will make headlines because a loophole in the law has been found; we expect the law to be free from holes, but very few people, even amongst professional chemists, appreciate the scientific problems which must be solved before such legislation can be enacted and enforced. For the ignorant chemists — myself included — this Bulletin is strongly recommended. It provides, amongst other things, a picture of the parallel development of the analytical methodology and the legislation in New Zealand, and makes it clear that DSIR scientists, mainly chemists, have been called on not only to do an enormous amount of analytical work, but also to interpret their results to Government and to suggest legislative and enforcement procedures. They seem to have been heeded, and to have established a reputation for efficiency and good sense which can only benefit the profession as a whole, as law and chemical analysis become increasingly entangled.

The nine papers describe a mixture of completed, continuing and exploratory work, some much more detailed than others. The first paper reviews the development of the law and the methodology for blood-alcohol

and evidential breath testing and then, courageously, examines the effects of the legislation on road safety. These are treacherous waters and the authors are cautious in their conclusion that "There appears to be some evidence that the drinking and driving legislation is effective in reducing the number of accidents caused by the drinking driver", but it's a valuable survey. The study of the incidence of repeat offences which follows is a limited one, allowing only limited conclusions to be drawn, but the numbers alone are disturbing enough. Two papers describing the analytical method in detail and the tricky problem of storing blood samples without ethanol loss by oxidation would make excellent reading for courses in analytical chemistry. The paper on computer control of the blood-alcohol analyses is admittedly a little dated now, but it was at the time pioneering work, especially in New Zealand. The final paper, describing the evidential breath test and its development using the commercial Alco-sensor, is fascinating reading and left me with an admiration for the tenacity of the chemists involved and an enhanced distrust of analytical black boxes used without a detailed understanding of their inward parts.

Drugs other than alcohol, and drug-alcohol combinations, are a significant, and probably increasing cause of road accidents. Two papers describe DSIR work in this area, one concentrating on the prescription drugs, and the other looking at cannabis; the latter provides a sobering reminder that of all the drugs, alcohol presents by far the easiest chemical and legal problems.

This glossy, well-produced DSIR Bulletin is obviously designed for wide distribution. It deserves it.

G. J. Wright
G.J. Wright is Reader in Chemistry at the University of Canterbury.

CONFERENCES OVERSEAS

For information on the following conferences contact the editor.

International Conference on the Theory of the Structures of Non-crystalline Solids, 3-6 June, 1985, Michigan, U.S.A.

10th International Congress of Heterocyclic Chemistry, 11-16 August, 1985, Ontario, Canada.

7th International Symposium on Cationic Polymerisation and Related Processes, 12-15 August, 1985, Jena, Germany.

30th IUPAC International Symposium on Macromolecules, 18-23 August, 1985, The Hague, Netherlands.

Electrical, Optical and Acoustic Properties of Polymers, 2-4 September, 1985, Sydney, Australia.

International Symposium on Applications of Mathematical Concepts to Chemistry, 2-5 September, 1985, Dubrovnik, Yugoslavia.

5th International Symposium on Marine Natural Products, 2-6 September, 1985, Paris, France.

12th International Conference on Organometallic Chemistry, 8-13 September, 1985, Vienna, Austria.

International Conference on the Applications of the Mossbauer Effect, 16-20 September, 1985, Leuven, Belgium.

**Our fume
cupboards,
fans and ducting
are where you'd
most expect
them.**

Maskell are in all universities and the greater proportion of research and educational institutions. The Maskell unitised PVC or GRP fume cupboard is something of a revolution. Until recently, design development had been static. Materials used such as wood and aluminium are ill-equipped to deal with chemical and corrosive fume attack. On site construction installation was awkward and expensive, requiring tradesmen to work around each other. The Maskell developed fume cupboard is a single, homogeneous unit. The unit incorporates electrical fittings, water and gas taps, pipework and sinks. PVC fans and ducting can also be built-in.

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For further information circle 24 on Reader Reply Card.

FUME CUPBOARDS

FUME CABINETS FROM INSAPIPE INDUSTRIES LTD

A fume cabinet serves two distinct functions: First, it is an integral part of a ducted system for air movement and should be designed to provide efficient removal of fumes under a variety of conditions.

It should be placed within a room so as to allow an even air flow into the cabinet across its full width. Locations close to open windows and doors should be avoided.

The air velocity at the cabinet opening is very important to achieve good fume containment.

The flow rate should be neither too low nor too high. Since every installation is different, it is necessary to consider the selection of duct and fan for each fume cabinet's requirements.

Secondly, the fume cabinet is a workplace, which may need to house special equipment such as hot plates, water baths and assorted glassware. The cabinet must have sufficient space to enclose these items and sufficient access to allow equipment to be set up and operated.

The arrangement of dimensions, sash opening, services and materials of construction needs to be carefully chosen to suit the intended use of the cabinet with regard to methods and reagents.

Insapipe Industries Limited specialises in the custom manufacture of "High Tech" fume cabinets from high quality rigid PVC and a range of other complementary materials, using standard and special profiles to manufacture a cabinet suited to individual requirements. Design of ducting and fan selection is included in the service and can be provided as a kitset or installed complete.

The company also manufactures polypropylene bench tops — "Polybench" features excellent chemical and bacterial resistance and it is ideally suited for use in the food industry. Polybench are custom-made to a wide range of sizes, incorporating sinks, from self-colour white or soft green stock.

Insapipe Industries is the sole Australasian agent for "Vulcathene", a total waste water system moulded in polypropylene, including wastes, drip cups, catchpots and a wide range of pipe fittings from 38 to 102 mm diameter. The Vulcathene mechanical jointing system is covered by patent rights. It is simple in concept, fast to execute, capable of being undone and remade many times over without affecting the joint's efficiency.

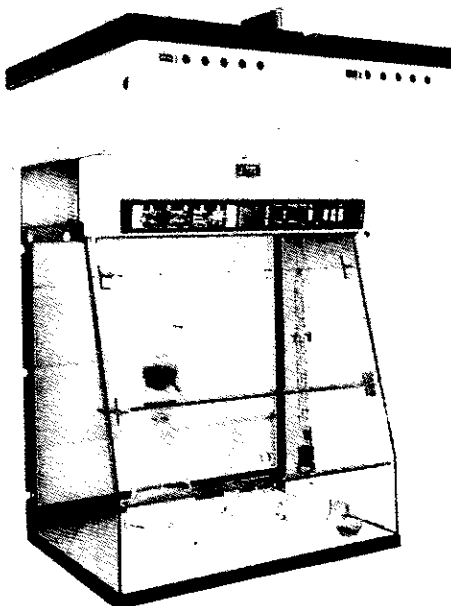
For further information on High-Tech fume cabinets, Polybench and Vulcathene waste systems, contact Insapipe Industries Ltd, or circle 17 on the reader reply card.

ORGANIC VAPOURS NO LONGER A PROBLEM

Both the increasing scientific evidence on dangers to health created by organic gases and vapours, plus the higher level awareness and concern for people to protect themselves against exposure to toxic fumes has recently encouraged the much greater use of fume hoods.

There is now an alternative to the traditional exhausting of such fumes to the atmosphere which offers many advantages. The Captair fume hoods filters toxic gases through a molecular filter with interchangeable disposable cartridges. They are designed for anyone who handles toxic substances such as toluene, pyridine, alcohol, M.E.K., xylene, ethylene chloride, formaldehyde, etc.

Advantages of Captair include:- units are completely ductless which means immediate, and no cost installation. It also means units can be relocated with ease. High efficiency filtration. Test reports are available which show a better than 99% filtering efficiency. Room air is also purified at a rate of 300 or 140 cubic metres per hour.



Particular attention has been given to safety features which provide protection to CAPTAIR users.

For example, the three-section doors are equipped with a system which prevents back-flow of contaminated air. In each of the two working positions of the door, the user has face and chest protection from splashes and vapors. All electrical components are mounted on the outside panel of the filter enclosure, removed from possible exposure to corrosive or flammable gases. The highest safety standards are complied with for all electrical components.

For safety reasons, acrylic plate has been selected for the clear panels. In case of explosion, the laboratory technician will be protected by this unbreakable screen. Should the panels be damaged, replacements are available and are easy to slip into the supporting guide.

Easily accessible, the cartridge of the molecular filter should be changed periodically. Our statistics, based on 20000 Captairs in use, show an average cartridge lifetime of about one year.

The retention capacity of the molecular filter varies according to the type of compound, and can be as high as 2000 g. For example, it retains 1500 g of CCl₄ (carbon tetrachloride), with a total degree of filtration efficiency during its lifetime.

For further information contact Kempthorne Medical Supplies Limited, or circle 18 on the reader reply card.

HOW ABSOLUTE IS ABSOLUTE?

Research conducted at Email Regents Park laboratory has placed a question mark against the traditionally accepted relationship between the HOT DOP and sodium flame test methods for HEPA (high efficiency particulate air) filters.

Up until recently, it was believed that for equivalent performance, a filter must show an efficiency of 99.995 percent using the sodium

flame test, against 99.99 percent using the HOT DOP method — which is a 2:1 difference in the degree of penetration.

The reason for this 2:1 ratio is the difference in particle sizes generated by the two tests. The sodium flame method generates particles with an average size of 0.6 micrometres, while the HOT DOP particle is only 0.3 micrometres in diameter — or half the size of the other test method.

However, Email's research has indicated that the difference in the degree of penetration could be as high as 15.1.

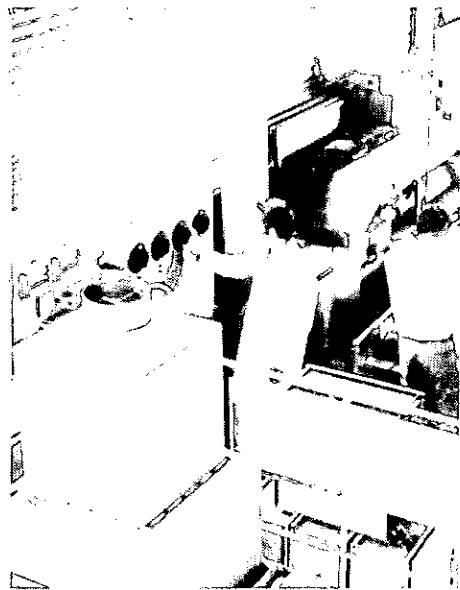
Naturally, this deficiency will only become apparent when the filter is HOT DOP tested because of the relatively large size of the sodium flame particles.

It should be appreciated at this stage that HEPA filters are used in highly critical situations — for example, where toxic or carcinogenic substances are used.

Interestingly, research conducted in the United States by Flanders Filters, one of the world's largest manufacturers of HEPA filters, has shown that even these figures may be conservative.

In fact, Flanders is suggesting 0.3 micrometre particles are around 300 times more penetrating than 0.6 micrometre particles.

Expressed simply, the table shows that when a marginal HEPA filter was tested to 0.6 micrometre particles, it registered an efficiency of 99.9999 percent. However, when retested using 0.3 micrometre particles, the efficiency plummeted to 99.97 percent.



Much of this research has been made possible by the development of new technology — notably the laser spectrometer that can measure particles as small as 0.12 micrometres, which is less than half the size of the HOT DOP particle, and more than four times smaller than sodium flame particles.

Both Email and Flanders have used the laser spectrometer extensively, and are breaking new ground in the high efficiency air filtration research field.

We will continue to invest in the research area in order to broaden the appreciation of filter performance, including the testing of HEPA filters from other manufacturers in Australia, Singapore, the United States and the United Kingdom.

For further information, contact Email Industries, or circle 19 on the reader reply card.

FUME CUPBOARDS

SAFETY ... THE KEY WORD IN FUMECUPBOARDS

Mention safety in the context of fumecupboards and the name Thermoplastic is certain to spring to mind. Thermoplastic Engineering Ltd are the only company in New Zealand which produces not one but three types of safety fumecupboards as well as a basic Utility fumecupboard. The first in the market with genuine safety fumecupboards and still the only company to produce a colour-coordinated specification, Thermoplastic Engineering have a long list of awards to prove that they know their business.

Designmark Awards on all four fumecupboards means that they have been inspected and approved by the Industrial Design Council. Placegetters with the Perchloric Safety Fumecupboard in the 1983 Prince Philip Award for New Zealand Industrial Design, they attend to aesthetics as well as to the functional aspects of design. Indeed, top quality, meticulous attention to detail and always a heavy accent on safety are part of the everyday philosophy of this company.

For example, the latest model to join the range, the Laminair Safety Fumecupboard has been extensively tested by the Department of Scientific and Industrial Research. The report evaluating the various aspects of the cupboard is available on request. Not only does this cupboard function superbly and safely; it is also easy on the eye. With body of rich italic cream and door trims in brown, interior fittings are colour-coordinated to suit. Appearance is

important to those who live in laboratories day in, day out.

But much more important is the safety aspect. This is achieved mainly by providing a laminar airflow across the working surface of the fumecupboard. This improved airflow greatly increases the fume containment and provides a much higher degree of safety.

Additionally, a specially slotted rear baffle operates in conjunction to draw fumes away from the workface; and another specially slotted roof panel removes any fumes from "dead areas" in the upper part of the cupboard. The result ... considerably greater safety for the user.

The fumecupboard itself and the slotted rear laminar panel are constructed from special fire-retardant rigid PVC sheet. Highly polished to maximise airflow, it is highly resistant to most chemicals and is extremely strong. Materials used in the floor are optional at the purchaser's request. Euroform, a patented non-toxic material displays exceptional resistance to acids, chemicals, heat and surface wear. Other options include 316 stainless steel, polypropylene and PVC plate.

While the new Laminair safety fumecupboard is suitable for most laboratory situations, there are some needs which call for something completely special. Every chemist knows the hazards associated with perchloric acid. Thermoplastic Engineering designed a fumecupboard specifically for use with this lethal chemical. The base of the cupboard is

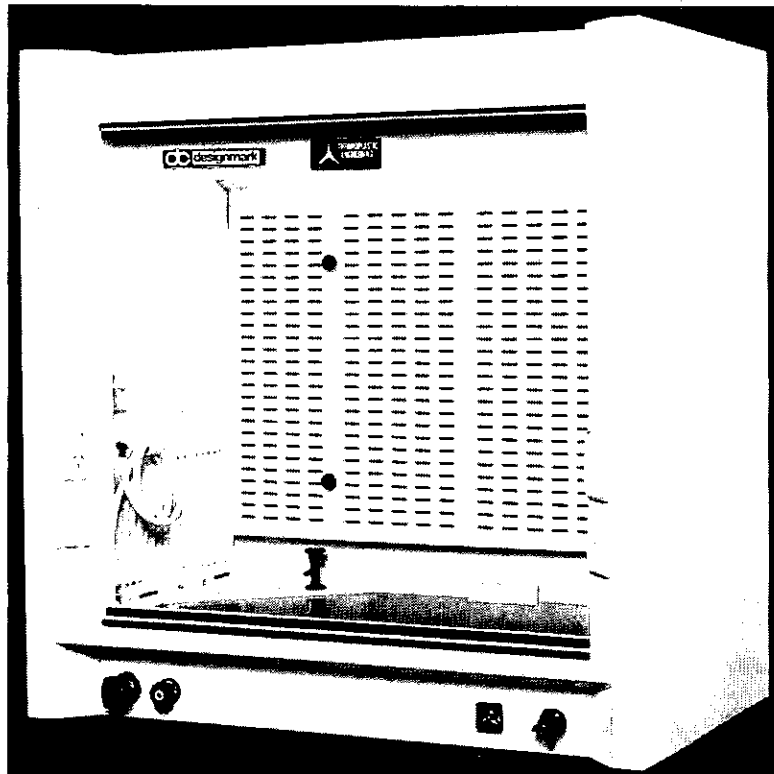
made from armour-plated glass raised above a PVC base which forms a shallow sink for washdown water. A small space is allowed between the edges of the glass and the sides and rear wall to allow for drainage of the working surface. A hand-held washdown shower is provided for washing down the inside of the cupboard.

No effort was spared in designing. Indeed this Perchloric Safety Fumecupboard won the Sheet Products Section and the Premier Award for elegance of design in the 1979 Annual Award Competition held by the Plastics Institute of New Zealand.

Managing Director Harold Trask is proud to tell anybody that all his fume cupboards are first class. The first fumecupboard he made some years ago is still in heavy demand because of its general application and doors which close completely during operation. So is the general purpose Utility fumecupboard which meets situations not involving aggressive chemicals or fumes.

All 1220mm high, 760mm wide front to back and from 915mm to 1830mm in length, Thermoplastic fumecupboards will accommodate to most locations. And by the way, for removal of troublesome fumes, Thermoplastic fumehandling fans provide answers internal and external, centrifugal and axial.

For further information, contact Thermoplastic Engineering Ltd or circle 21 on the reader reply card.



NEW SAFETY SAFER LAMINAIR FUMECUPBOARD

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A TOP QUALITY FUMECUPBOARD

Greater safety ... Laminair airflow across working surface... no dead spots.

Fire Retardant and Resistant ...chemically resistant — made from rigid PVC sheet.

COLOUR-Coordinated ...body in rich italic cream, brown door trim, and interior fittings to harmonise.

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For further information circle 2 on Reader Reply Card.

FUME CUPBOARDS

CLEAN BENCHES CUT RISKS FOR LABORATORY STAFF

It is freely recognised that exposure to aerosols that are a by-product of such operations as blending, homogenising and sonicating is a major cause of laboratory infections. From a safety viewpoint, it's those particles or droplets that range in size from 0.5 to 5.0 micrometres that present the greatest hazard because they are respirable and can be retained in the lungs.

Particles larger than 5.0 micrometres soon settle out due to their weight, and those smaller than 0.5 micrometres tend to be breathed out again rather than retained in the human lung.

Good technique by properly trained staff is one way to reduce the aerosol problem. However, this can be minimised further by the employment of containment devices such as clean benches and biological safety cabinets.

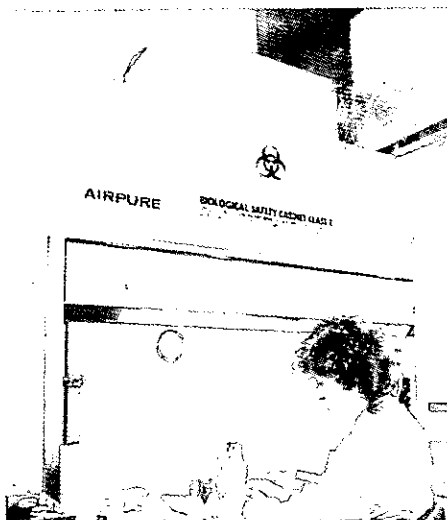
A variety of these devices are produced by the Australian company — Email Limited, parent company to Email Industries which has branches in Auckland, Wellington and Christchurch.

The company's range of Airpure primary containment devices covers four major types:

- laminar flow cabinets
- biological safety cabinets — Class I
- biological safety cabinets — Class II
- laminar flow cytotoxic drug safety cabinets.

Laminar flow cabinets use unidirectional air flow to provide a clean area within which a product can be handled or manipulated.

They can be supplied with either horizontal or vertical airflow, and are designed as modular work stations for use where product manufacture, handling or packaging requires an



environment free of airborne contaminants.

Cytotoxic drug safety cabinets are used in pharmacy applications which involve the preparation, manipulation or dispensing of cytotoxic drugs. Many of these are known to be mutagens, and are also suspected of being carcinogens and teratogens.

The effects of these drugs are most insidious, because in many cases untoward symptoms may not manifest themselves for a number of years.

A barrier created by laminar airflow not only protects the product, but also maximises the containment of aerosols generated within the work zone. Contaminants are then trapped by a separate HEPA filter located immediately

below the work zone. This filter effectively removes the risk of contamination of the cabinet and its fans.

Recirculated air passes back through the laminar flow filter or is exhausted, while an activated charcoal filter removes gaseous contaminants.

Additionally, all positive pressure plenums and filter seals are surrounded by negative pressure zones, thus reducing the likelihood of contaminated air escaping from the cabinet.

Email's Air Handling Products department has produced literature on each of the safety cabinet types as well as an application manual. The manual, which can be obtained free of charge, is believed to be a world-first in terms of its scope and attention to detail.

It not only considers the range of cabinets and benches available and their respective applications as detailed in local Standards, but also discusses their limitations, maintenance and location requirements.

A section is also included on testing of the HEPA filters which are so critical to the success of any containment device.

It highlights some new research currently underway at Email's Regents Park laboratory which places a question mark against the traditionally accepted relationship between the HOP DOP and the less-demanding sodium flame test methods.

At the end of the manual the company has provided a guide which allows the end-user to objectively evaluate clean bench suppliers, as well as an easy-to-use check-list on cabinet types.

For further information, contact Email Industries, or circle 20 on the reader reply card.

CHOOSING A FUME CABINET?

High-Tech

A C.P.L. PRODUCT

The High-Tech range of fume cabinets has been designed to give maximum flexibility to suit specific laboratory requirements. From standard to perchloric conditions, cabinets are complete with a comprehensive range of associated laboratory equipment and include fans, ducting, exhaust discharge outlets etc.

INSAPIPE INDUSTRIES LTD

P.O. BOX 12-313 PENROSE
TELEX NZ 2610

PHONE AK 593014

CHCH67671



Somebody just stamped on your new safety cabinet.

If you've chosen an Email Airpure safety cabinet, it will arrive with some very important stamps on it.

The stamps are your assurance that the heart of the cabinet, its HEPA air filters, are each exhaustively tested and certified to conform with clause 4.3.1 of the Australian Standard AS1324. This Standard has been formulated to ensure that human life is not placed at risk during the manipulation of dangerous substances.

Listed on the stamps will be the results of individual testing carried out on each filter in Email's NATA-registered laboratory, and yet another stamp – the AS Mark of the Standards Association of Australia.

The AS Mark certifies strict conformity with the relevant Australian

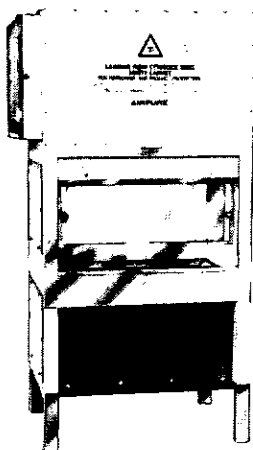
Standards and is your further assurance of the quality and safety inherent in those vital filters.

As a final endorsement, the cabinets housing the HEPA filters conform with the Australian Standard applicable to their particular type.

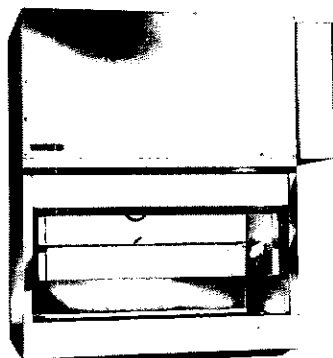
Why all the fuss about standards and stamps? Because Email believes that nobody should take chances with their health or life.



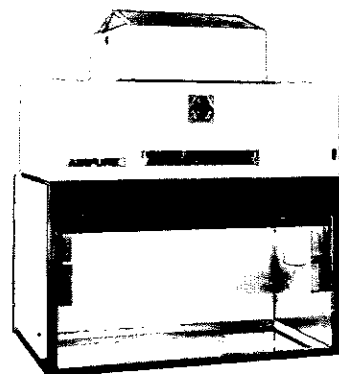
Laminar flow



Cytotoxic



Class II biological



Class I biological

EMAIL
ELECTRICAL ENGINEERING DIVISION
AIR HANDLING PRODUCTS



Scientific Products Division — Smith Biolab Ltd.

AUCKLAND: Phone 483-039, Private Bag, Northcote
WELLINGTON: Phone 697-099 P.O. Box 31-044
CHRISTCHURCH: Phone 63-661 P.O. Box 1813

Please send your free clean bench application manual and details of the Airpure range.

Name _____

Address _____

Postcode _____

Marketed by Smith Biolab Ltd.
TELEPHONE 483-039
PRIVATE BAG, AUCKLAND, NEW ZEALAND. TELEX NZ 21637

EM578

For further information circle 7 on Reader Reply Card.

FUME CUPBOARDS

FUME CUPBOARDS — THE SAFE FUME HANDLING METHOD

The ever increasing use of potentially dangerous or health risk chemicals in manufacturing processes and laboratory work emphasises the need for good ventilation. Maskell Productions' many years of experience designing and building fume extraction systems has shown a fume cupboard to be the best means of ensuring that both fumes and liquids are contained, and expelled, where they can cause minimal harm.

Our designs for these are under constant review to maintain the highest safety standard. As an example Asbestos cement sheeting is no longer used as a worktop. This has been replaced by imported high quality Ironstone tiles.

From the very simple to the very sophisticated Maskell have a solution to the problem. Our Aerofoil Bypass model was chosen in preference to an overseas design for the new laboratory at Marsden Point. This gives a constant face velocity at all door openings and the baffle arrangement ensures complete scavenging of the interior — essentials laid down in the specification.

Petrochemicals handling is exacting enough, radio isotope work is possibly more so. Several of our cupboards, designed and built specially for this service have been in use for some years. These have a unique system of fresh air supplied via extremely efficient filters and a removable aerofoil sill. In some cases lead lining has also been incorporated where additional protection is required.

Perchloric acid is another dangerous substance needing a cupboard that will have no crevices or hidden places where it may collect. From our first perchloric unit, some fourteen years ago and still in service, we have progressed to models having built in spray booms that will wash down the interior at the turn of a knob or hand held sprays for more local washing. All surfaces of course are smooth and designed to give good drainage during cleaning.

Not all units need to be so sophisticated. The main object being to direct fumes away from the operator. This can only be achieved with certainty where the the source of fumes cannot be affected by unpredictable draughts. Thus the cupboard affords this protection. The open (or partly open) door must have an adequate velocity flowing in to the unit. There are recommended velocities for various duties. This is obviously affected by the area of the opening and the performance of the extraction fan. Maskell fans have a wide range of performance and are available in PVC or fibreglass. We are able therefore to select the most suitable to give adequate extraction without going to the extreme where a Bunsen flame is extinguished or room temperature is severely affected and excessive power is used.

Maskell Productions have the capability to design, manufacture and supply systems for the safe handling of hazardous or corrosive fumes, systems designed for specific situations from Heavy Industrial to Laboratories and Research Institutions.

For further information, contact Maskell Productions Ltd, or circle 11 on the reader reply card.

LAMINAIR SAFETY FUMECUPBOARD

The Laminair Safety Fumecupboard adds a new dimension of safety to fumecupboard design. As the name implies, the new cabinet provides a laminar air flow across the working surface of the fumecupboard. This improved air flow greatly increases the fume containment and provides a much higher degree of safety.

The range from Thermoplastic Engineering Ltd now includes four different designs: the Utility Fumecupboard, the Safety Fumecupboard, the Perchloric Fumecupboard, and the new Laminair Fumecupboard. Each design is available in four different cabinet sizes from 0.85 cubic meters up to 1.70 cubic meters. In addition the customer can specify a choice of Euroform, 316 Stainless Steel, PVC Plate, Polypropylene, or Colorith flooring materials and a wide range of optional sinks, cups, water, gas and suction fittings, hand held wash-down showers.

Thermoplastic's venting systems are also very versatile. They offer six models of extraction fan including axial interior, exterior weatherfan and centrifugal fans.

For a full product brochure, technical advice, or order form contact Smith-Biolab Ltd, or circle 12 on the reader reply card.



WE HAVE THE ANSWERS TO
CORROSIVE FUMES OR LIQUID CONTROL

FAN CASTINGS: Fabricated from calendered sheet and with welded construction. These cases are suitable for a very wide temperature range.

Bifurcated fan **P.V.C. Centrifugal fume fan** **Fume Cupboard fan**

A CONSULTATION SERVICE IS AVAILABLE TO ALL ARCHITECTS - ENGINEERS AND DESIGNERS

Plasfab Installations Limited
24 Hill Street, Onehunga, Auckland, Telephone 666-689

For further information circle 10 on Reader Reply Card.



The new Mettler PE LabPac makes life in the lab easier.

The Mettler LabPac programmes Mettler PE balances to do the types of weighing you do in your lab each day. Turns the balances into lab specialists.

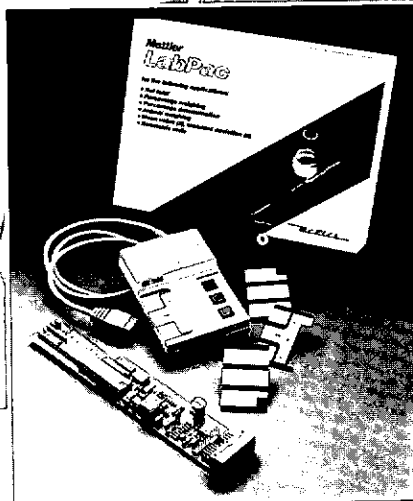
For example, if you need to do net total weighings, you simply plug in the LabPac's net total key, and away you go. The same is true for other laboratory weighing procedures. Want to do percentage weighing? Plug in the appropriate key. It's the same for statistical weighing (mean value/ standard deviation) and

animal weighing. It couldn't be easier.

The PE LabPac also incorporates a data output (RS232C and current loop) which allows you to interface with computers and other peripheral equipment.

LabPac interfaces with the new PE balances.

There are fourteen balances in Mettler's PE series. Readability ranges from 0.001g to 1.0g and capacities go up to 24 kg.



Mettler LabPac is the key to faster and easier weighing in the laboratory.

Each of the new PE balances features automatic calibration, a micro-processor controlled integration cycle, stability indicator in the read-out and DeltaDisplay, which allows you to hit target weights quickly and accurately.

Another aspect of the PE LabPac package you'll like very much is the price. You'll find the pricing of the PE balance you need and the comparison LabPac most attractive.

WATSON VICTOR LIMITED

P.O. BOX 1180 PHONE 857-699 WELLINGTON

BRANCHES AT —

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P.O. BOX 1216
PHONE 593-039

CHRISTCHURCH
P.O. BOX 706
PHONE 69-282

DUNEDIN
P.O. BOX 921
PHONE 777-291

PRODUCT NEWS

SEMINAR — GRAPHITE FURNACE TECHNIQUES

Advanced Electronics Ltd is planning to run a series of seminars in late 1985 (probably September) designed to introduce the latest developments in graphite furnace technology.

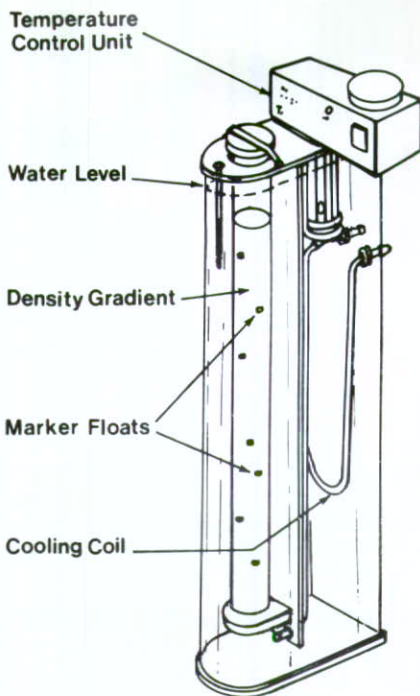
One of the principal speakers will be Dr. Jarda Matousek, who is on study leave at the Chemistry Department, University of Canterbury, February to November 1985. Dr. Matousek is from the Chemistry Department, University of New South Wales in Sydney, and has published a number of papers relating to atomic absorption spectroscopy, and graphite furnace techniques.

Whilst at the University of Canterbury, Dr. Matousek will be experimenting with the recently acquired GBC Model 903 AA with the GF1000 Graphite Furnace.

For further information, contact Advanced Electronics Ltd, or circle 13 on the reader reply card.

DENSITY GRADIENT COLUMN

The 700mm thermostated column from Techne is filled with two liquids, the proportions varying throughout the column. This results in a linear density gradient, typically 0.1 g/ml over the length of the column. Calibrated glass floats of precisely known density are introduced to the column and their equilibrium position allows a calibration curve to be constructed. The apparatus allows the rapid determination of density to four decimal places, and suggested applications include the determination of the degree of crystallinity in plastics such as nylon, teflon, polypropylene, polyethylene and PVC, determination of trace amounts of boron in silicon.



New Zealand agents are Watson Victor Ltd, for further information, circle 14 on the reader reply card.

COLE PARMER CATALOGUE

The 816 page Cole Parmer catalogue for 1985-86 is available free from Smith Biolab's Scientific Products Division.

There is a large section on Environmental monitoring including Air/Noise/Gas measurement and sampling, testing and treatment. All Cole Parmer equipment is airfreighted from the United States, with delivery 8-10 weeks.

Contact Smith Biolab or circle 15 on the reader reply card.

CATALOGUES FROM ALLTECH/APPLIED SCIENCE

The 1985 Alltech/Applied Science Catalogue will be available in New Zealand in May.

This revised and expanded 416-page book lists many new products, including:

A new range of Direct Connect Cartridge Columns for HPLC, giving over 2,000 possible format combinations.

New Non-Pakd Drug Analysis Columns for Anticonvulsants, Drug Screening and Identification.

A range of Knurl-Lok universal HPLC fittings fully compatible with all the 10-32 fittings currently in use from Beckman, Rheodyne, Swagelok, Valco and Waters. No wrenches are required to form connections.

Eldex and Milton Roy HPLC Pumps.

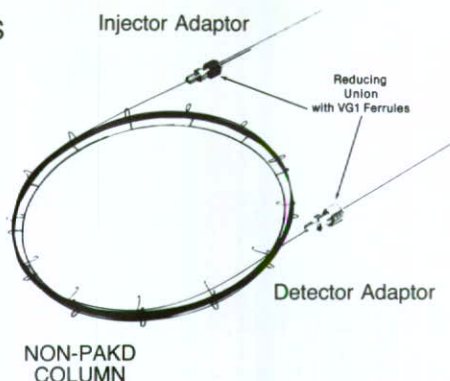
All these are in addition to the very comprehensive range of actual chromatograms, traditional in the Alltech/Applied Science Catalogue.

To ensure a copy of this Catalogue, contact Alltech New Zealand or circle 15 on the reader reply card.

A brochure entitled 'Handy Bits and Pieces for the Laboratory' which includes a selected range of hand tools, tubing and tube fittings etc is also available on request from Alltech New Zealand, or by circling 16 on the reader reply card.

THE MAGIC OF ALLTECH NON-PAKD™ GC COLUMNS PUTS EXCELLENCE INTO CHROMATOGRAPHY

- REPLACES PACKED COLUMNS
- SIMPLE INSTALLATION
- FITS CONVENTIONAL GC'S
- BONDED PHASES
- TESTED
- HIGHER EFFICIENCY
- EXTREMELY INERT
- FASTER ANALYSIS TIMES



The 0.53mm ID NON-PAKD columns offer higher efficiencies, shorter retention times and greater inertness than packed columns. The phases are bonded to give longer life, lower bleed and greater reproducibility. Combine this with the advantages that NON-PAKD columns are flexible and inherently straight, and you have the ideal chromatographic column. Simple, inexpensive adaptors allow you to adapt virtually any GC to these capillaries. The NON-PAKD columns can be run with TCD detectors.

ALLTECH ASSOCIATES N.Z.

P.O. Box 33-527, Takapuna, Auckland 9. Phone (09) 444-3230. Telex NZ61111 'ALLTECH'.

PRODUCT NEWS

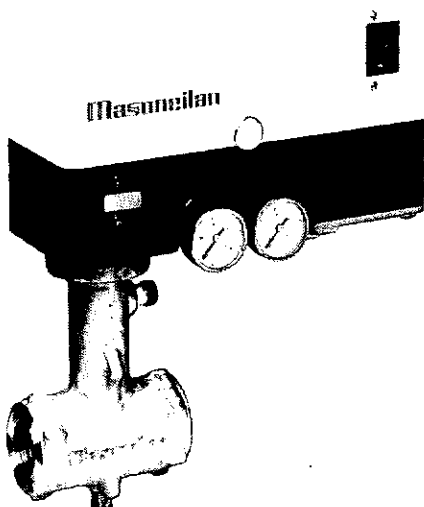
ADJUSTABLE FLOW VALVE

Inherent problems in accurately achieving fluid control under very low flow conditions have been overcome by Masonellan with its unique Varipak adjustable flow valve.

Varipak is the first adjustable flow coefficient valve specially designed for small flows. Accuracy is the prime factor in achieving fluid control under very low flow conditions. Each item in the control loop, pumps, transmitters, orifice plates etc, should have intrinsic performance features matching the accuracy required for measurement or control of the whole loop.

It is obvious that in such cases the better the performance and accuracy of the final control device, in this case the valve, the more successful the performance of the whole loop.

The flow coefficient Cv of the Varipak can be continuously adjusted from 100% to 40% of nominal Cv without any change in the pneumatic control signal. This very easy manual operation can be performed prior to installation, but it can also be performed without any inconvenience when the valve is already installed and in operation.



For further information, contact the NZ agents W Arthur Fisher Ltd, or circle 27 on the reader reply card.

SHIMADZU UV 240 COLOURPAC SYSTEM

The UV 240 colourpac system features high precision colour measurement and calculation by spectrophotometry. It is based on the Shimadzu UV 240 spectrophotometer which is a microprocessor controlled, double beam, reporting, spectrophotometer. This instrument is comprised of two units: the optical unit, and the control unit with built-in printer-plotter. The UV 240 will meet all present and future laboratory requirements since it is designed to provide all the requirements for a top class spectrophotometer and the flexibility to be used with a range of accessories from semi and automatic sampling devices tablet dissolution systems and personal computers.

The UV 240 Colour Matching System uses the excellent optics of the UV 240 with an integrating sphere attachment which is easily mounted (and dismounted) in the spacious cell compartment and interfaces these to a personal computer. Calculated values are printed out together with the reflection spectra in report format. XYZ values are calculated at 5 nm sampling intervals, correction of reflectance value and calculation programmes for the 3 illuminants. Various other formats are also available.

For further information contact Sci-Med (NZ) Ltd, or circle 28 on the reader reply card.

MONITORING CHANGES IN pH VALUE

A new pH meter uses an in-built printer and microprocessor to record and signal dynamic pH values. Programs offered are:

1. Audible alarm when pH (or mV) values go outside a pre-programmed range.
2. Printing of pH value at preset intervals until a pre-programmed pH value is reached.
3. Printing of pH value at preset intervals until pre-programmed time.

The model HI 8418 Printing pH Meter incorporates the standard features of a high-technology instrument with automatic buffer recognition, temperature compensation and calibration.

Additionally, it offers the programs outlined above and prints results on the built-in impact printer.

- sequential sample number
- date
- time
- temperature
- pH value

Results may be printed on a continuous paper roll or on labels for quality assurance purposes.

Price of the 8418 printing pH meter as described — only \$800.00.

For further information contact Alphatech Systems or circle 29 on the reader reply card.

HOTPLATE MAGNETIC STIRRER

The Ikamag RET Hotplate Magnetic Stirrer is a recently developed unit which incorporates an impulse frequency control which constantly compares the set speed with the actual speed (0-1100 r.p.m.), ensuring that the set speed remains constant irrespective of viscosity changes of the medium. Stirring power and speed constancy surpasses all expectations.

The RET has a silumin heating plate, 600W element contact thermometer connection. Many accessories are available including such items as extension plate, bath top, sand bath dish, support rod, etc.

Inspection of this top of the range unit is available through the New Zealand distributors Kempthorne Medical Supplies Ltd, or circle 30 on the reader reply card.

GILSON microman™

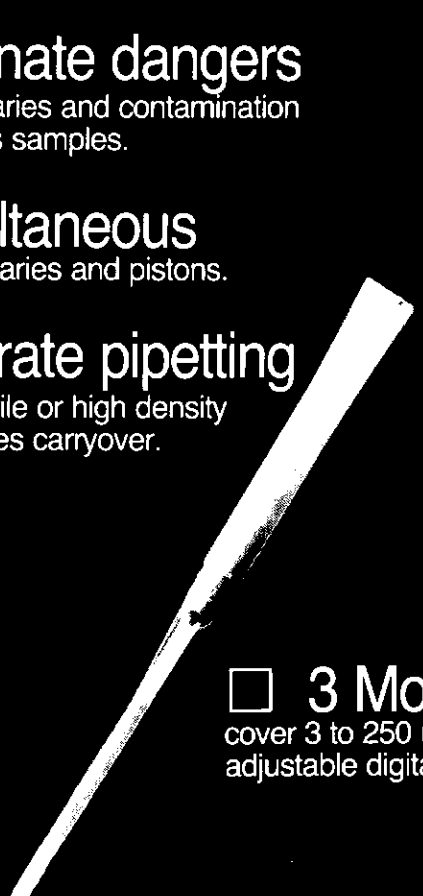
digital positive-displacement micropipette

Eliminate dangers of broken capillaries and contamination from Hazardous samples.

Simultaneous ejection of capillaries and pistons.

Accurate pipetting of viscous, volatile or high density liquids. Eliminates carryover.

3 Models cover 3 to 250 ul continuously adjustable digital setting.



JOHN MORRIS SCIENTIFIC
Unit 2, 96 Ellice Road, GLENFIELD
AUCKLAND 10, NEW ZEALAND
PO Box 6348, AUCKLAND 1
PHONE: Auckland 444-5836 Lower Hutt 693-244

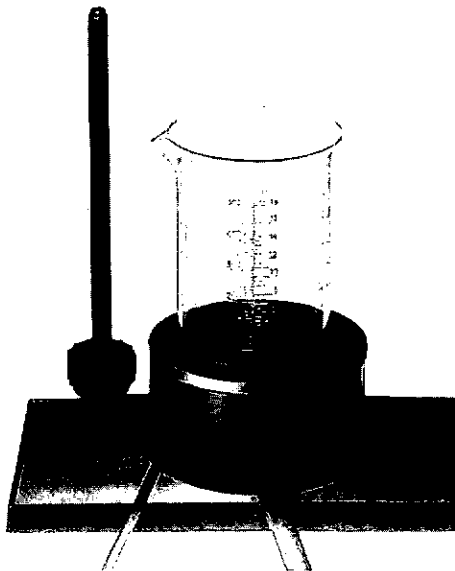


GILSON

PRODUCT NEWS

PLASTIC LABWARE FROM KARTELL

Lab Supply Pierce (NZ) Ltd, advise that they are the sole New Zealand agents for Kartell re-usable and disposable plasticware. The range includes magnetic stirring bars; tapered stoppers for volumetric flasks; test tubes and accessories; graduated and volumetric ware; hospitalware; cups and vials for coulter counters, autoanalysers and scintillation; bottles and accessories; and equipment for vacuum and filtration. One unique item is a non-electric magnetic stirrer, driven by either water or air, ideal for use *inside* water baths.



For a copy of the Kartell catalogue, contact Lab Supply Pierce (NZ) Ltd or circle 25 on the reader reply card.

NEEDLE GUARD

A unique safety device is about to be released onto the New Zealand and Australian market and should be distributed Worldwide within a few months. The device called "Needle Guard" helps protect individuals from needle-prick injury from hypodermic needles and venepuncture needles. The "Needle Guard" is a plastic shield in which the needle sheath is held so that replacement of the needle into its sheath after use may be performed in a safe manner.

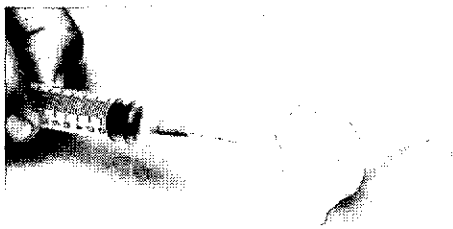
The device was invented by 3 New Zealanders who work in the hospital setting and are familiar with the problems relating to transmission of infection by needle injury. At Auckland Hospital alone over 500 needle-prick injuries are reported annually and of these and unreported injuries about 10 cases per year of clinical hepatitis B occur amongst nursing, medical and technical staff.

Amongst the health care community there is considerable anxiety about acquiring AIDS through the working environment especially in the handling of blood. Although there is little evidence so far that hospital workers are at increased risk, the fear is very real and "Needle Guard" will provide some practical help in reducing this anxiety. To date only one person has been reported to have been infected with the AIDS virus by accidental needle prick. It is almost certain other cases will occur.

The Centre for Disease Control (CDC) Atlanta, U.S.A. and the Australian Health Services Council AIDS Task Force have formulated recommendations for handling needles to prevent transmission of hepatitis B and AIDS. They recommend that needles should *not* be resheathed after use and should be placed in puncture-resistant containers. The

CDC go so far as to recommend handling of the unsheathed needle with forceps to remove it from the syringe or venepuncture needle-holder. The "Needle Guard" will circumvent this dangerous and cumbersome procedure.

Another device designed to destroy needles by cutting them off is not likely to gain wide acceptance because of the possible hazard of aerosols. The Australian Health Commission has already pointed this hazard out and is therefore unlikely to recommend its use in Australia.



The "Needle Guard" comes as a package with a specially designed disposable plastic container into which sheathed needles are ejected. The container, when full, can be burned or autoclaved.

The "Needle Guard" inventors have trialed the device within the hospital and laboratory setting. Because of its simplicity and ease of use and practical value its acceptance has been universal. Judging from its popularity it is likely that the device will become a readily accepted part of routine procedure for all venepunctures and injections including the handling of cytotoxic drugs when injected into intravenous giving sets. "Needle Guard" also has wide applications in the veterinary field.

For further information, contact Smith-Biolab Ltd, or circle 26 on the reader reply card.

alsep ER-180A

ANALYTICAL BALANCE

- * 180gram capacity
- * 0.0001g resolution
- * Automatic built in calibration
- * Interface options
- * Under balance weighing capabilities

The ER-180A offers extreme accuracy combined with ease of use and application versatility. Contact:



E.C. Gough Ltd

Auckland: Phone 763-174
Wellington: Phone 686-675
Christchurch: Phone 798-740
Dunedin: Phone 775-823

EG2064

CHEMISTRY IN NEW ZEALAND YEARBOOK 1985

Compilation of the 1985 Yearbook with its listings of chemical suppliers, scientific instrument agents, consultants etc. will soon get underway.

If your company was listed in the 1984 Yearbook you need do nothing at the moment, we will be contacting you. However, if your company was not listed in 1984 but would like to appear in the 1985 Yearbook please send the name of your firm, postal address, telephone number and name of contact person to:

1985 Yearbook
P.O. Box 9072

Newmarket, Auckland
and we will forward you a questionnaire.

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF CHEMICAL TECHNOLOGY

PROFESSOR AND HEAD OF DEPARTMENT (RE-ADVERTISEMENT)

Applications are invited for the above position in the Department of Chemical Technology.

The Department offers degree courses in applied chemistry (analytical chemistry), food technology, and mineral technology. There are also plans to provide post-graduate diploma courses where appropriate.

The University seeks to appoint a well qualified applicant in any of the above fields. Applicants should preferably possess a higher degree, have had any considerable experience in tertiary academic institutions, research establishments or industry. He or she would be required to provide quality leadership in both teaching and research. Present research is orientated towards the industrial, environmental and community needs of Papua New Guinea.

The position is currently vacant. Previous applicants need not apply.

Salary: Professor and Head
K24,355 per annum plus Head of Department allowance (K1,100) per annum. (NZ at 2.104)

Initial contract period is for approximately three years. Other benefits include a gratuity of 24% taxed at 2%, appointment and repatriation fares, leave fares for the staff member and family after eight months of service, settling-in and settling-out allowance, six weeks paid leave per year, education fares and assistance towards school fees, free housing, salary protection plan and medical benefit schemes are available.

Detailed applications (two copies) with curriculum vitae together with the names and addresses of three referees and indicating earliest availability to take up post should be received by:

The Registrar,
Papua New Guinea
University of Technology
Private Mail Bag, Lae
PAPUA NEW GUINEA

BY 1 JULY 1985.

PRODUCT NEWS

SYSTEM FOR DIETARY FIBRE DETERMINATION

The Fibertec E from Tecator incorporates an enzymatic method designed for rapid and convenient gravimetric assay of dietary fibre according to established methods, including those described by the AOAC (tentative), Asp et al, Furda, Hellendoorn, Thomas, and for sample preparation in conjunction with detailed studies of fibre fractions. The Fibertec E determines total dietary fibre (TDF) as well as soluble and insoluble fibres separately.

The Fibertec E comprises a Shaking Water Bath for batchwise incubation of 12 samples and a Filtration Module for combined filtration and filtrate collection of 6 digested sample.

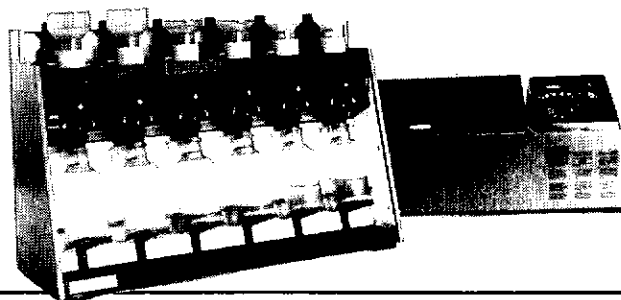
The Fibertec filtering technique is well

proven in earlier instruments for crude fibre and detergent fibre determinations. The filtering time is typically 2-4 minutes for 100 ml of digested solutions.

The specially designed handling system with a minimum of containers ensures safety and convenience.

Fibertec E results are highly reproducible (S.D. 0.5% absolute), the instrument is easy to use, and it performs 24 determinations per day according to the tentative AOAC method.

The Fibertec E concept has been tested in some well-known laboratories. Information on these tests as well as other documentation on the Fibertec E are available from Tecator AB, or circle 22 on the reader reply Card. New Zealand agents, Wiltons.



FRONT COVER STORY

BASF VITAMINS

It was the famous scientist C. Funk who gave a name to the substances, still unknown in his time, which must be made available to the body "from outside": vitamins.

One could be forgiven for believing that Avitaminosis or Hypovitaminosis is a thing of the past, at least in industrialised countries with high standards of living.

However, even today symptoms of deficiency appear (tiredness, inability to concentrate, nervousness, lesions on the skin and nails, susceptibility to infection, decreased colour vision, and night blindness to mention but a few) and these arise from poor diet, one sided eating habits, and meals prepared in a manner which does not conserve vitamins.

The body needs high intakes of vitamins, in particular to enable us to cope with the severe physical and mental stresses to which we are exposed every day.

In short, the amounts of vitamins which we consume nowadays with our food are not always sufficient.

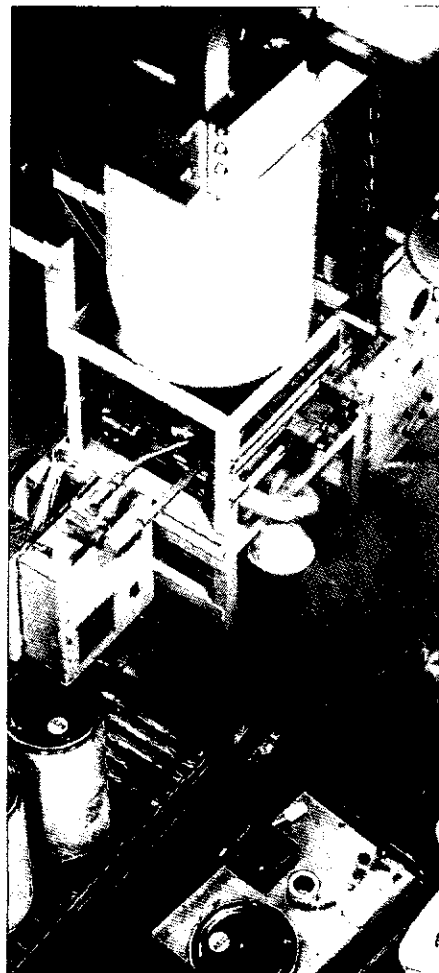
BASF is one of the world's biggest manufacturers of vitamins and thus helps bridge the vitamin deficiency gap: vitamins from BASF are backed up by the entire group's extensive R & D work, application technology and market knowledge. We are continuously working on further developments in order to be able to offer the pharmaceuticals, foodstuffs, cosmetics and animal nutrition industries other vitamin formulations.

Ultramodern large scale production processes, in some cases using our own synthesis methods, and the employment of precursors from our own raw material resources, ensure the availability of BASF vitamins.

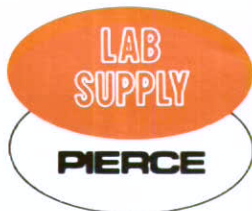
All BASF vitamins, however varied their forms, comply with the requirements of the relevant pharmacopoeia.

BASF is a go-ahead partner with outstanding products and ever-ready technical service.

For further information, circle 23 on the reader reply card.



"Production of vitamin A powder, at the new vitamins complex at Wyandotte, Mich., is part of a BASF global strategy to be a full-line supplier of nutritional products. The complex and technically advanced plants result from long-term leadership in vitamins process research."



Labsupply **Pierce** (NZ) Limited

7/41-53 View Road Glenfield P.O. Box 34-234 Birkenhead Auckland 10 New Zealand Tel. 444-7314 Telex NZ21424



FRANK SPURWAY

I take this opportunity to introduce to you the staff at Labsupply Pierce.

We have recently moved our premises, re-organised our store and we are all keen to provide you the very best of service.



ALAN AGGETT

OUR NEW ADDRESS IS:

7/41-53 VIEW ROAD GLENFIELD.

Our telephone numbers have changed to:

(09) 444-7314

(09) 444-7392

Our Box number is unchanged at P.O. Box 34-234 Birkenhead Auckland 10.

WE LOOK FORWARD TO BEING OF SERVICE TO YOU



SUE SPURWAY



MARGARET WIGG



NADINE AINSWORTH

Grant Spurway



SUE BLACK

AMARELL
ALDRICH CHEMICAL COMPANY
AQUA CHEMICALS
ATOMIC PRODUCTS LIMITED
BOCHEM PLASTIC LABWARE
BDH CHEMICALS
BILBATE
BRANSON
CHROMALYTIC TECHNOLOGY
CHROMPAK
DESAGA
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DYSAN
EMSCOPE
ESCHENBACH
EXELO
GLASWERK WERTHEIM
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HECHT
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IRWIN DESMAN
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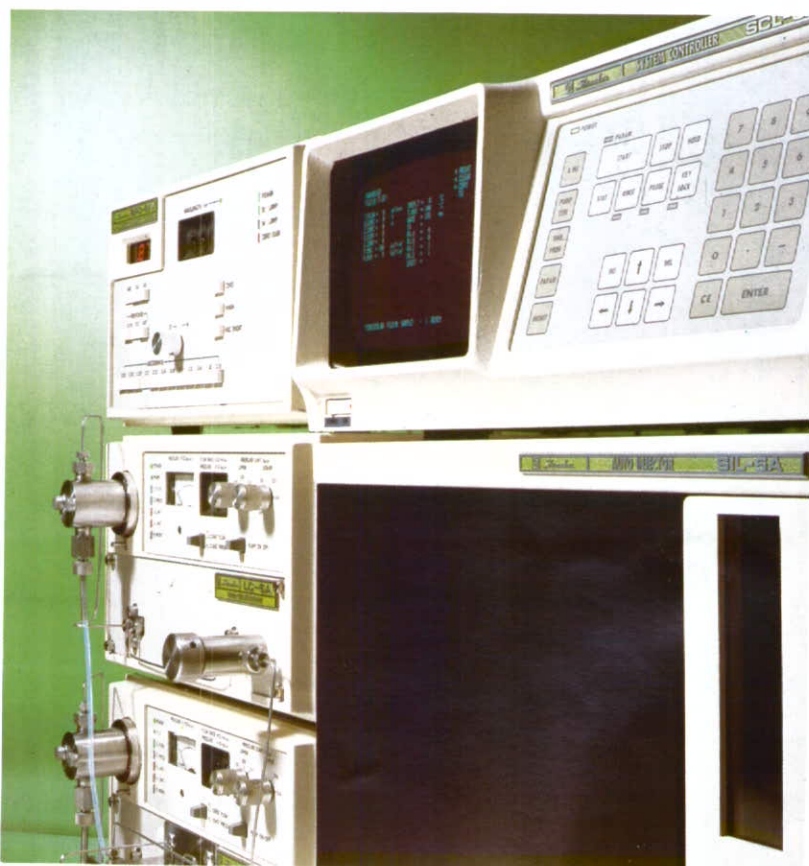
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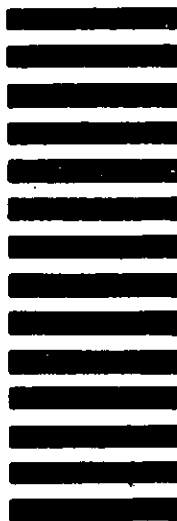
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