


June 1984 Volume 48 No. 4.



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Editor: Dr Bruce Graham, c/- Dept of Health, 2 Edenvale Rd, Mt Eden, Auckland.

Branch Editors:

Auckland: Dr Roger Whiting, Auckland Technical Institute, Private Bag, Auckland.

Waikato: Dr Max Sutton, Ruakura Soil and Plant Research Station, Private Bag, Hamilton.

Manawatu: Dr Cecil Johnson, DSIR Applied Biochemistry Division, Private Bag, Palmerston North.

Wellington: Mrs Gill Sutherland, 70 Spencer Street, Crofton Down, Wellington.

Canterbury: Dr John Cretney, Christchurch Polytechnic, P.O. Box 22095, Christchurch.

Otago: Dr Derek Whyman, Chemistry Dept, University of Otago, P.O. Box 56, Dunedin.

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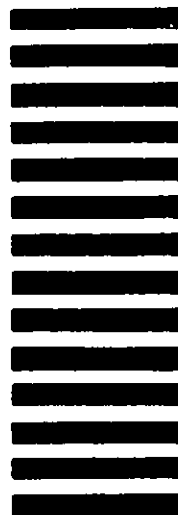
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EDITORIAL

My first encounter with the NZIC was at the 1971 annual conference in Hamilton. As a D.Phil student at the University of Waikato I was roped in along with other available hands to operate slide projectors, issue registration packages, and steer elderly members in the right direction. For me, the high (or low?) point of the conference was one of the plenary lectures given by a distinguished overseas visitor. I had the privilege of operating a rogue projector. By the time the slides had automatically advanced for the third time it was generally recognised that I was not deliberately trying to disrupt proceedings, and we all settled back and enjoyed the display.

For such efforts all the research students were given free registration and a copy of the conference issue of this journal. That particular issue was notable for the aerial photograph of the Waikato campus featured on its cover — a view most of us had not seen before. The contents of the journal were not exactly memorable, however. Conference abstracts, branch news, and the Institute accounts. The whole unenlivened by a single photograph, bar those in a few advertisements.

Whether that issue represented a watershed in the publishing of the journal I do not know. What is clear is the significant changes that have occurred in its appearance over the last 13 years, and in particular the last two under the editorship of Tony Herd. I believe that we now have a journal that reasonably reflects the diverse activities of the members of the Institute, and is interesting, informative and also pleasing to the eye. For this, all credit to Tony, his editorial committee and the present publisher.

One of the controversial issues of the time when I first joined the Institute was the subject of membership by examination. They tend to take a fairly down to earth attitude to things in the Waikato, and the most memorable comment on the matter was made by one of the longer-serving agriculturalists. "If anyone's fool enough to want to join up that badly, why put obstacles in the way?" He went on to point out how little the Institute had to offer its members — monthly meetings of limited interest, an annual conference for the academics, and a bi-monthly "rag". I think most members will agree that on the latter point we are now getting value for money.

As noted in the Council News (this issue), the Institute acknowledges Tony Herd's efforts in bringing the journal to its present standard. If Tony's comments in his editorial of December 1983 are to be taken literally, perhaps a subsidy on a hair transplant operation would be a more tangible gesture. From one with only the faintest of receding hairlines — Tony, I'll try not to muck it up.

Bruce Graham



LETTERS TO THE EDITOR

Progress Report from Paul Farr:

It would seem that chemists are not such an immovable bunch after all.

The letters of reply (to the February Editorial) have been most heartening and are providing interesting reading. However, the sale of stamps hasn't soared and a few more replies would make the ground a little surer. (What earth shattering revelations have been uncovered?)

So to all out there who have been reticent for fear of notoriety your anonymity will be preserved. Therefore please refer to February's editorial and have your say.

Paul Farr

MEMBERSHIP

Lester Stonyer has his say:

Sir,

The majority of the membership of our Institute, except perhaps in Auckland, consists of research chemists in Government or government-assisted bodies, academics in universities, and teachers in schools and colleges. However a very little enquiry will show that there are many chemists in industrial and commercial occupations who could be members, but who somehow we have failed to attract.

We are probably doing better than in the past, with our active encouragement to students in our tertiary organisations, but why don't we ask ourselves a few questions? For example:

- * What does the Institute offer to these missing people in the way of status or recognition?
- * What does membership of the Institute mean to prospective employers?
- * Do employment agencies/management consultants ever put "NZIC membership is desired" in their advertisements?
- * Does the news media have any idea of the distinction between Scientists, Pharmacists and Chemists?
- * How many of our members have ever been asked to contribute information to a daily, weekly or monthly publication sold to the general public?
- * How is it that lawyers, accountants, doctors, architects and even engineers seem to be better defined and understood in the public arena than chemists?

The answers to these questions might suggest where we have gone wrong in failing to have the membership of "commercial" chemists that we should.

Please don't bring up the fact that some professionals must join their society before they can do many types of work — we have a code of ethics! Where do land agents (who have to pass examinations) stand in the status scales? If we want membership to mean something we must get our message across to the public. Lawyers, who saw some of their work slipping away, have conducted a publicity campaign about the advantages of using their services, and have set up a simple scheme for asking a lawyer if you need his advice — and they charge for this! Why not publicise the fact that consulting chemists are available if people don't want to employ a full-time chemist?

Full page comic strips in the Listener, showing what chemists do, and how brilliantly they solve commercial problems, may be beyond our means, but I suggest that the very least we must do is to prepare a well thought out statement of what a chemist (Institute member of course!) is, and send out several thousand copies to business managers, news organisations, and perhaps to some of those other professionals I mentioned above. If we get really serious about enhancement of our status, employing a publicity agent to suggest what else we should do, is an obvious step.

C.L.H. Stonyer

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A CHEMICAL AND COMMERCIAL BACKGROUND TO EVENING PRIMROSE OIL

L. Eyres and D. Fenton — ABELS LTD



Dr Laurence Eyres has been with Abels Limited for ten years commencing work initially as their research and development chemist and being promoted to Chief Chemist in 1980. Before taking up his mainly administration role his research interests lay in the analysis by gas chromatography of unusual lipid sources.

Laurence has been involved with the NZIC at branch and national level for ten years but now his studies at Auckland University for an MBA preclude all but minor involvement. He is

currently chairman of the NZIC Oils and Fats Specialists Group and has recently replaced Stan Brooker as the Honorary Librarian.

Diana Fenton joined Abels Limited in November 1980 as a technician and since January 1981 as Research Chemist has continued the work initiated by Laurence Eyres. Diana completed her MSc in Chemistry at Auckland University in February 1981 and over the last year has been involved with the NZIC editorial committee.

Investigation of some old fashioned remedies have led to isolation of important medical drugs, and one of the popular cures currently under study is the oil produced from seeds of the evening primrose plant family, or OENOTHERA species of the ONAGARACEAE family. The evening primrose plant was known long ago by herbalists as a general panacea; indeed it has been known as "King's Cure-all".

Evening primrose oil (EPO) is a topical subject amongst some medical research groups and health food suppliers since it is recognised as being a source of gamma-linolenic acid.

Edible fats and oils are composed from triglycerides or triacylglycerol molecules, which are fatty acid esters of glycerol. The component fatty acid chains and their arrangement as component triglycerides determine the physical properties of the fat or oil. Fats and oils are routinely characterised by analysing the overall fatty acid composition of the component triglycerides as their methyl esters by GLC.

All natural fats and oils contain some saturated, some mono-unsaturated and some poly-unsaturated fatty acid groups. Most naturally occurring oils contain unsaturated acids in the cis configuration.

Essential fatty acids are recognised as a necessary dietary intake similar to many vitamins, in that they cannot readily be synthesised by normal metabolic processes. There are 2 series derived from linolenic acid and α -linolenic acid.¹ (See fig.1 in the paper by Scott — this issue).

Vegetable oils such as sunflower safflower and soyabean oils are in common household use and are normal constituents of

table margarines, salad dressings, and industrial margarines used to prepare pastry, cake, bread and biscuit foodstuffs. These 3 oils are good sources of polyunsaturated and essential fatty acids. Evening primrose oil similarly contains polyunsaturated and essential fatty acids, but it is distinguishable from soyabean oil in that it contains gamma-linolenic acid. (Table 1)

TABLE 1

FAME COMPOSITION of VEGETABLE OILS

	Safflower	Sunflower	Soyabean	Evening Primrose
16:0	7	6	10	7
18:0	3	5	4	2
18:1	11	17	22	12
18:2	76	69	53	69
γ -18:3	—	—	—	9
α -18:3	0.2	0.2	9	—

Companies marketing evening primrose oil promote this exotic commodity as a health food supplement and cosmetic cream ingredient — "rich in essential fatty acids".² They would

also seem to attribute many diseases and ailments to faulty metabolism of linoleic acid by an enzyme labelled for its activity as delta-6-desaturase. Failure of this enzyme to function would, based on a simple biochemical production path to prostaglandins from essential fatty acids, account for an incorrect balance of PG 1 and 2 prostaglandin series and their derivatives. Suppliers of evening primrose oil suggest that by taking suitable doses of their product, one can by-pass any delta-6-desaturase deficiency, and allow metabolism to further products. (No mention is made of other possible enzyme deficiencies.) They suggest that many health problems of the Western World stem from a diet rich in fats, and in particular saturated fats and trans-unsaturated fats derived from hydrogenation of vegetable oils. Calculations based on Abels' knowledge of NZ edible fat consumption indicate that total consumption of trans-fatty acids in the NZ diet is low, polyunsaturated oil consumption is adequate,³ and the latter fact more than compensates for any trace level of trans, trans-18:2 fatty acids, which if eaten without cis, cis-linoleic acid, have been shown to interfere with normal fatty acid metabolism.⁴

Health fadists latched on to "trans-fatty acids" as being harmful and have yet to realise NZ margarines made with hydrogenated oils contain trans-18:1 acids, produced by the same mechanism as microflora use in the gut of ruminants to produce the same trans-18:1 acids also consumed in milk, cream and butter.⁵

A very high fat intake is generally regarded as inadvisable by nutritionists. Manufacturers of EPO suggest it inhibits delta-6-desaturase enzyme activity, but this (they claim) can be corrected with suitable doses of gamma linolenic acid, and either because of this or due to other reasons, they suggest it will also alleviate or remedy such diverse ailments as schizophrenia, atopic eczema, rheumatoid arthritis, multiple sclerosis, high serum cholesterol, cardiovascular disease, diabetes, premenstrual tension, hyperactivity, obesity, ageing and even brittle finger nails.¹

This is wonderful, if true — but EPO treatment for clinical, cosmetic or other reasons is far from cheap. The recommended 3-6 500 mg capsules per day mean many NZ families pay \$100 per week to treat someone with serious medical problems. It is in their interests to see the benefits of taking EPO or gamma linolenic acid validated.

A growing awareness of the so-called 'unique' properties of evening primrose oil has been fostered largely by 3 British companies now represented throughout the world.

EFAMOL is the largest oil producing company which formed in the early 1970's, and has Dr David Horrobin, who visited NZ last year, eagerly persuing research on benefits of using evening primrose oil.

First to be established was Bio Oils Research, founded in 1970 through interest aroused in 1959 by John Williams, (not the guitarist).

More recently Evening Primrose Oil Products Ltd was formed in 1980 as a joint venture between Germplasm Resource Management and Readimix Concrete Ltd. In consultation with their team is Dr Colin Leakey, half brother of famous anthropologist Richard Leakey. Their aim is to grow EPO in a short single season, as a rotation crop between winter cereals.⁶

The wild evening primrose plant is a biannual, easy to grow in most soils from a small leafy plant which rapidly shoots to a height of 2m in the second year and flowers over 2-3 months. The romantic name of the species comes from its attractive fragrant yellow flowers which open at dusk at a rate of about 10 per minute. The flower fades the next day and in late summer or early autumn seed pods develop and release oil-containing seeds.⁷

Mature seeds are roller milled, and the oils solvent extracted with hexane at mild temperatures. Solvent is removed under vacuum and the extract water washed, dried and sold.² This seems to conflict somewhat with the basic philosophy of some health food devotees who seem to prefer their vegetable oils cold pressed.

The presence of γ -linolenic acid in Evening Primrose seeds was recognised in 1919 when 10% of the seed oil was shown to be the 6,9,12 isomer. Confirmation of this isomer was reported in 1927 by ozonolysis and 1949 by fractionation and derivatisation.⁸

FIGURE 1

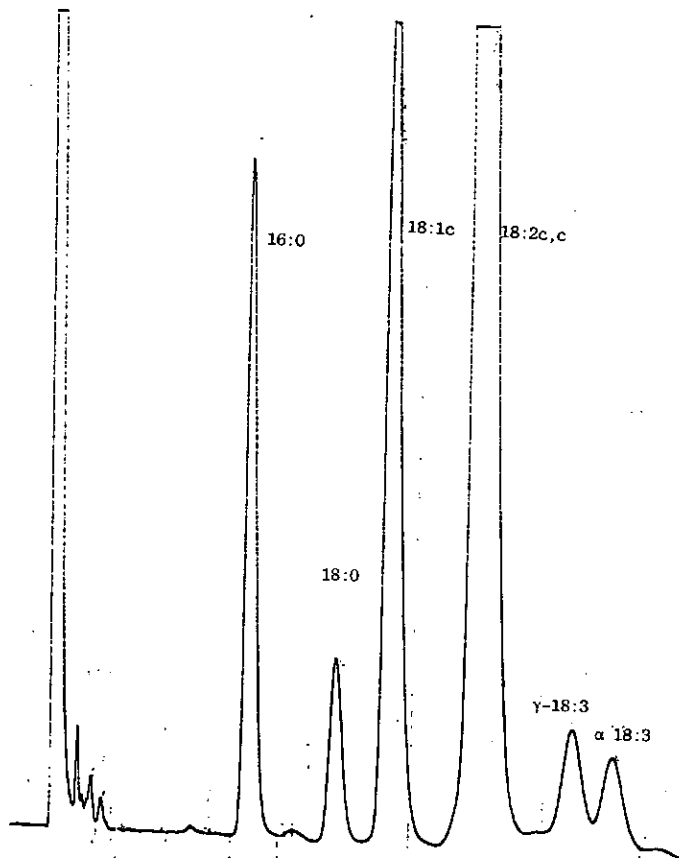


FIGURE 1

FAME ANALYSIS of 1:1 EPO: Soyabean oil on 5.5m OV-275

The easiest and most reliable technique to distinguish the isomer from the normal α -linolenic acid isomer is by GLC.⁹ Suitable phases to allow such analysis have been available in the last decade. The apparent "rarity" of the isomeric acid may simply be because until recent times, it couldn't readily be distinguished from α -linolenic acid.

Abels Ltd have participated in authenticating several evening primrose oil samples. We use a 5.5m glass column packed with 15% OV-275 on stationary support and can clearly resolve linolenic isomers from genuine EPO and soyabean oil. Shortly we will be using capillary GLC to further improve resolution. (Figure 1)

From communications with the Leatherhead Food Research Assoc. and reported composition studies, all genuine oils will contain 8-14% γ -18:3 and 75% will contain 10-12% γ -18:3.¹⁰ The variation in seed oil composition probably reflects the seed maturity at time of harvesting. Some analyses of samples sold on the local market a few years ago had been adulterated. Determination of genuine samples is illustrated in table 2, where a minimum of 8% γ -18:3 should be present.

Far from being the sole source of γ -linolenic acid, EPO could compete with other reported natural sources. It is found in human milk fat, hence EFAMOL and others suggest infant feed formulae should incorporate EPO. But is also reported in other oilseeds — some such as borage at higher seed yields but usually with α -linoleic acid too. It is also reported present in protozoa, algae, fungi and may be even more widespread than realised if it were keenly sought.¹¹

TABLE 2

	FAME COMPOSITION of EVENING PRIMROSE OIL SAMPLES			Evening Primrose
	Safflower	Sunflower	Soyabeen	
16:0	7.5	6.2	13.7	9.9
18:0	3.1	1.8	6.2	3.7
18:1	14.0	11.9	23	29.8
18:2	67.7	70.6	50	56.0
γ -18:3	7.2	9.5	—	—
α -18:3	—	—	6.9	—

EPO but low γ -18:3 EPO + Sunflower	EPO	Soyabeen Not EPO	Sunflower/ Cottonseed NOT EPO
--	-----	---------------------	-------------------------------------

Seeds produced by *Oenothera Biennis* are very small — about 2800 per gram weight.

This seed contains:¹²

25%	Oil	
43%	cellulose and lignin	0.01% α — tocopherol
15%	protein	0.02% γ — tocopherol
5%	starch, sugars	
8%	water	
5%	ash	

of this 25% oil content about 10% of that is the γ -linolenic acid, equivalent to 2.5% of the seed. This is smaller than other possible yields but part of the marketing strength for EPO comes from its lack of the other essential fatty, acid, α -linolenic.

The plant is described as being easy to grow, and yields 0.25-0.5 t per acre of seed, of which 1/5 is useable oil. The seed alone is sold for about \$5/kg.

In 1982 20 t of EPO was produced worldwide, returning an equivalent of \$NZ 187,000/t. at peak price.⁶ NZ importers pay

\$100-120/kg for the oil. This is sold in local health food shops for about \$15.50 for 50 500mg capsules, or effectively \$610/kg.

Compare this with a normal retail price of soyabeen oil (containing α -linolenic acid) at \$1.80 kg⁻¹ and cold pressed Sunflower oil at \$15.00/kg. World tonnage of sunflower oil production is 4.6 Mt and of Soyabeen oil, 12.4 Mt.

To conclude, EPO is simply a vegetable oil containing an unusual, but certainly not unique, fatty acid. In view of the enormous price differential between this and common polyunsaturated vegetable oils, more basic medical research needs to be produced to substantiate the claims made by marketers of the product, and prescribers of the oil should be wary of adulterated oils.

REFERENCES

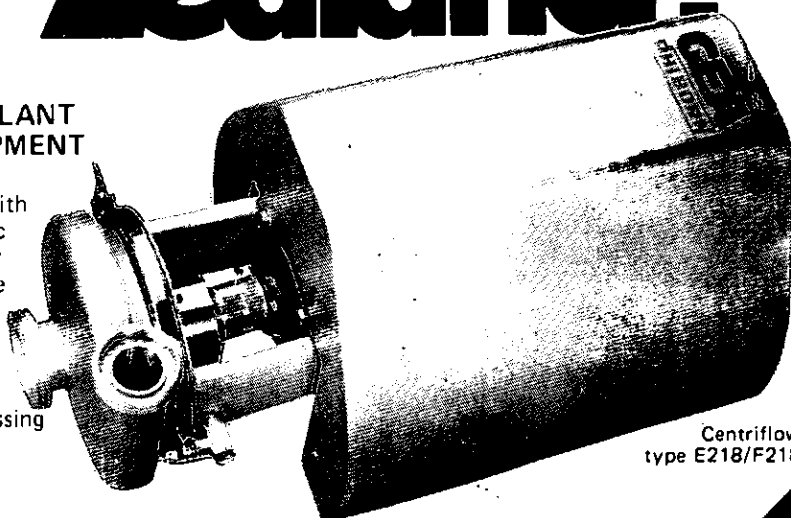
1. Horrobin, D.F., *Essential Fatty Acids: A Review*, Eden Press Inc. 1982.
2. Literature from EFAMOL Ltd, Agrihold House, 40 Warton Rd, London England; and BIO OIL Research Ltd, Royal Oak Building, High St, Crewe Cheshire, England.
3. Eyres, L., *Fats for the Future*, Duromark Publishing, Proceedings of the International Conference on Fats and Oils, Auckland, 1983, p.231.
4. Appewhite, T.H., *J.A.O.C.S.* 58: 260 (1981).
5. Somerfeld, Matthias, *Prog. Lipid Res.*, 22: 221 (1983).
6. *Chem and Industry.*, 728, (1983).
7. "Complete Book of the Garden" Readers Digest Services, 3rd Edition, Australia, 1977.
8. Hilditch, T.P., and Williams P.N., "*The Chemical Constitution of Natural Fats*", 4th Edition, 1964.
9. Manku, M.S., *J. Chromatographic Science.*, 21: 367 (1983).
10. Private Communication from Leatherhead British Food Manufacturing Industries Research Assoc., England and Hudson, B.J.F., *J.A.O.C.S.*, 61 : 540 (1984).
11. Wolf, R.B., Kleiman, R. and England, R.E., *J.A.O.C.S.*, 60 : 1858 (1983).
12. Hudson, B.J.F., *J.A.O.C.S.*, 61 : 540 (1984).

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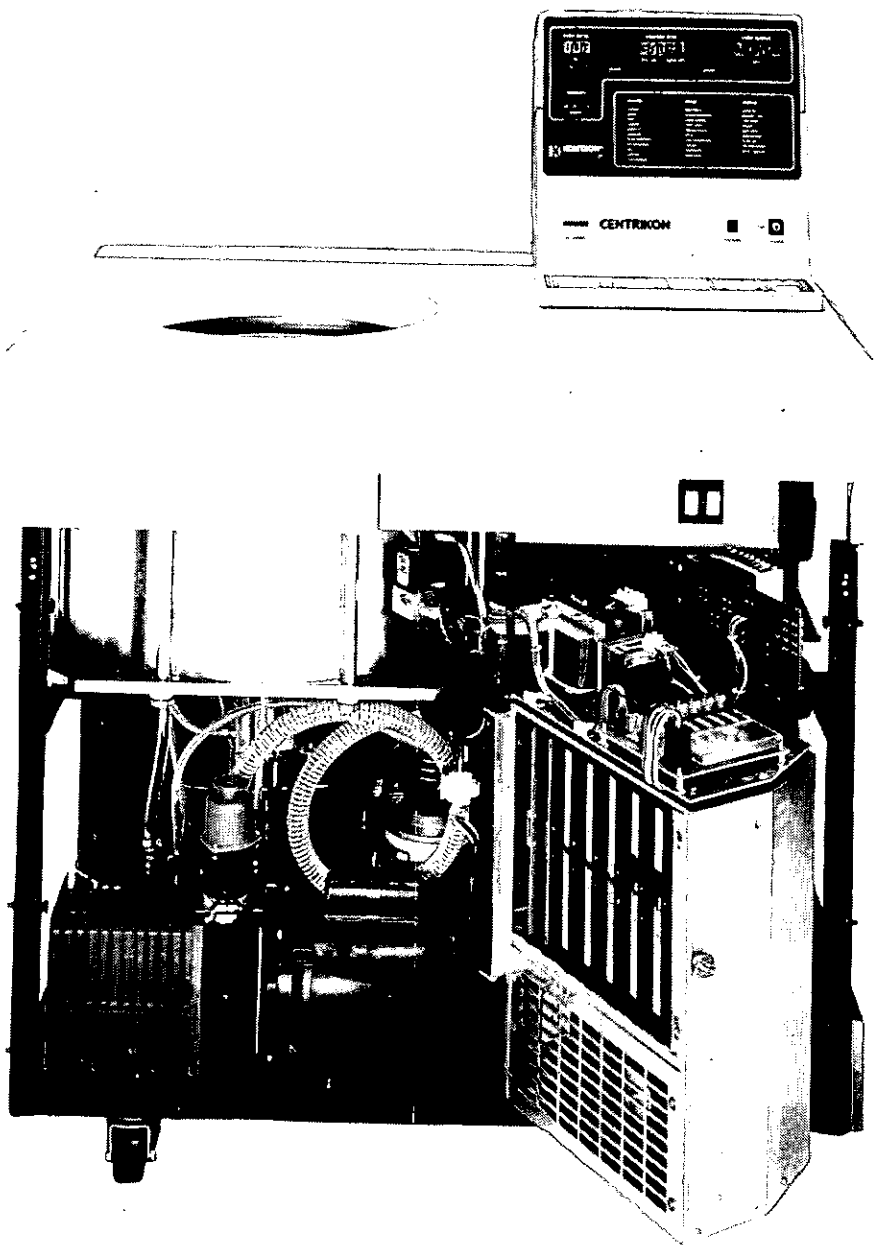
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REGISTRATION FORM

1. Please complete in black for later xeroxing, using ticks or numbers (✓) where necessary.
2. Return with remittance for Registration, accommodation deposit and Section D events to the Conference Secretary.—
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3. Make cheques payable to "1984 NZIC Conference Committee".
4. If posted after 26 June, a late fee of \$10 must be added except for students and overseas registrants.



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NZIC/NZBS Member — full conference at \$50 or days at \$20/day	\$
Student member — full conference at \$10	\$
Non-member — full conference at \$60 or days at \$25/day	\$
Bonafide student — full conference at \$20 or days at \$8/day	\$
Late Fee (if posted after 26 June) (\$10)	\$

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SECTION C — Accommodation

Arrival date Time/Flight No.

Departure date Time/Flight No.

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SCIENTIFIC PROGRAMME OUTLINE

The Scientific Programme will commence at 11am on Monday 20 August with an opening by the Minister of Science and main sessions will conclude at 5.30pm on Thursday 23 August 1984. Two Specialist meetings will continue on the Friday. The main features of the programme, in approximate order of occurrence, are:

Spectroscopy as a Structural Tool

Professor D M Doddrell (Griffith University, Queensland) and Dr J H Johnston (Victoria University) will be the plenary speakers. Prof. Doddrell will speak on structural applications of 1-D Multipulse NMR in liquids (e.g. the INADEQUATE, INEPT and POMMIE pulse sequences) and Dr Johnston on applications of Mossbauer spectroscopy.

BIOCHEMISTRY: Research and Development in Vaccine Production

Dr R Saint (Walter and Eliza Hall Institute, Melbourne) will describe both molecular biological and immunological approaches to malaria vaccine production. Dr Saint is a member of a team working with considerable Australian Government assistance pioneering R & D in this field.

Clinical Biochemistry Symposium

A joint symposium with the Association of Clinical Biochemists centred on the topic "Peptide Hormones" is planned beginning Tuesday morning.

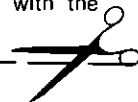
Catalysis and Energy

In the first of two plenary lectures, Professor Sir George Porter, FRS, (Director of the Royal Institution of Great Britain and a Nobel prize-winner) will outline developments in photochemical energy conversion. Professor D L Trimm (University of New South Wales, Australia) will present an overview of catalysis in various energy applications. There will be contributions later from the NZ Synfuels Corporation Limited and research workers from CSIRO and BHP (Australia). This symposium will continue on Friday (24th) in a less formal workshop manner. Delegates wishing to attend the Friday meeting should include Thursday night accommodation on the registration form.

Contemporary Advances in Molecular Biology

(a) Fundamental

Dr W Tate (University of Otago) will give a lecture with the



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Railton Hotel (estimated cost \$17 bed & breakfast; transport to University supplied)

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To DAY _____ TIME _____

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Hotel (estimated cost \$60 upwards per unit for 2 people)

Dates (inclusive) Deposit \$60 \$

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SECTION D — Other Events

NZIC Conference Dinner (\$23) (Wednesday 22 August) Cost \$

Workshop Sessions (choose 1 only) (\$10 registration) (Tuesday afternoon, 21 August; see Programme) Ion Chromatography } \$
HPLC Applications }

Field Trips (Wednesday afternoon, 22 August) Choose up to 3, in order of preference by entering 1, 2 or 3 in boxes. Cost: Payable on arrival at conference (estimate \$3 for Trips 1 to 5)

- | | | | | | | |
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| 2 | Chemistry and Industrial Processing Division, OR Physics and Engineering Laboratory, DSIR, at Gracefield. | <input type="checkbox"/> | 5 | Wallaceville Animal Research, MAF, at Upper Hutt. | <input type="checkbox"/> | |
| 3 | Geological Survey and Soil Bureau; DSIR, at Lower Hutt. | <input type="checkbox"/> | 6 | Seismological Observatory and NZ Meteorological Service, at Wellington. | <input type="checkbox"/> | \$ |

Opening Mixer complimentary (Monday 20th Evening)

Trade Luncheon complimentary (Tuesday 21st)

Sub total D \$

SCIENTIFIC PROGRAMME OUTLINE

suggested title "The Ribosome : a complex cell organelle revealing its secrets".

(b) Applications to Agriculture

Drs T Broad and W Sutton (Applied Biochemistry Division, DSIR) will speak on the potential for molecular biological manipulation ("genetic engineering") in animal and plant production respectively.

Computer Graphics as a Structural Tool: Applications to Large Molecules

Dr M Guss (X-ray crystallography group, University of Sydney headed by Professor H Freeman) will illustrate the chemical features of the copper-containing plant pigment plastocyanin using some of the latest computer-generated graphics.

Chemistry in the Exploitation of Geothermal Energy in New Zealand

Dr R W Henley (Wairakei Research Centre, DSIR) will outline some of the chemical problems experienced during geothermal-based energy developments in NZ.

NZIC Education Group/SCICON 84 Education Symposium

Sir George Porter will present a second, education-oriented talk to registrants of both conferences on Tuesday evening. Thursday has been set aside for a joint-conferences session held at the SCICON venue, which will include contributions from J Shallcross, Rt Hon M Wellington and R Marshall, MP.

Quality Assurance Symposium

Dr J Garside (Director of TELARC) has organised a symposium on Thursday afternoon on quality assurance techniques in the laboratory. Two experienced Australian registration assessors will contribute to a session that should interest all laboratory managers and scientists.

Workshops: Ion Chromatography and HPLC Applications

The emphasis of both Tuesday afternoon sessions will be "hands-on" demonstration of techniques, using working instruments, and problem-solving for the laboratory user. Some knowledge of the methods will be required by participants.

Forensic Specialist Symposium

(Friday 24 August)

An independent symposium will be run on Friday 24 August on the subject "Certainty & Probability in Forensic Results". It is included here for the programme overview. All enquiries should be addressed to Dr P L Cropp, C/- Chemistry Division, DSIR, Private Bag, Petone.

Poster Prize

There will be a prize for the best POSTER presented at the conference. A special presentation will be made at the conference dinner. Suggestions about poster preparation are on P66 of this Journal.

CONTRIBUTED POSTERS AND PAPERS

Contributed Posters & Papers

Delegates are invited to present POSTERS or papers at Conference on any aspect of chemistry. It is anticipated that contributed posters and papers will form a major part of the scientific programme.

For lecture presentation, 15 minutes will be allowed plus 5 min. discussion. For poster preparation, contributions will be mounted on supplied bulletin boards (4 feet x 3 feet) in the morning prior to the session and one of the authors must be present for this session.

Each contribution will be allocated to one of the following groups; **Please indicate your preference(s)**

Analytical, Biochemical, Chemical Education

Chromatography, Crystallography, Electrochemistry, Geochemistry

Industrial, Mass Spectrometry, Organic

Thermodynamics, Catalysis & Energy, Inorganic Chemistry, Spectroscopy

Environmental Chemistry, Polymer Chemistry.

Preparation of Abstracts

Abstracts will be published with the Programme in the Conference Booklet and will be photographically reproduced. Diagrams or structural formulae may be included. The Abstract must be typed, one and one half spaced, with black carbon ribbon, and diagrams must be drawn in black. Place an asterisk after the name of the author who will present the paper. All material must be inside a rectangle 110mm high by 140mm wide, on A4 paper. Authors are responsible for the final appearance of their abstract.

REGISTRATION

Example:

DEEPER PROPERTIES OF WATER:

V.I.C. Blarney* and C.D. Stone

Department of Polar Research, University of Scott Base and the Aswan Dam Department, University of the Nile.

The deeper properties of water (H₂O) have been shown to be due to cross-linking of ...

Address for Abstracts:

The chemistry and biochemistry abstracts should be sent to:

Dr. Graeme Gainsford, 1984 NZIC Conference Secretary,
C/- Chemistry Division, DSIR,
Private Bag, PETONE.

Student Paper Competition

The usual student presented-paper competition will be held. Students nominated from each university will have their travel expenses and two nights accommodation paid. Further details may be obtained from the Conference Secretary if required.

Trade Display

A variety of equipment and related products will be displayed by scientific supply houses. The display will be the Maclaurin Foyer adjacent to main lecture theatres. Morning and afternoon tea and coffee will be available adjacent to the trade display.

Travel

Air travel concessions are available within New Zealand. These concessions must be claimed when tickets are purchased and are available on presentation of a voucher, which will be forwarded by the Conference Secretary to those requesting it on the Registration Form. It should be noted that the present Epic fares offered by Air New Zealand would provide for much cheaper travel than the above air travel concession voucher.

PROGRAMME OUTLINE: NZIC CONFERENCE 20-24 AUGUST 1984

TIME	MONDAY 20th	TUESDAY 21st	WEDNESDAY 22nd	THURSDAY 23rd	FRIDAY 24th				
9.00 a.m.	REGISTRATION (Informal Tea/Coffee)	Biochemistry Plenary (Saint)	CATALYSTS & ENERGY (C&E) PLENARIES: (TRIMM) PLENARIES: (PORTER)	Physical & Geochem (Guss) (Henley)	Education Symposium With SCICON	C & E Workshop	FORENSIC Meeting "Certainty & Probability in Forensic Science"		
10.30 a.m.		Coffee/Tea	Tea/Coffee	Tea/Coffee	Tea/Coffee		Tea/Coffee		
11.00 a.m.	OPENING (MIN. OF SCIENCE, CHANCELLOR & CITY REP.)	Biochem Symp. (Clinical Biochemists)	C & E Cont.	BIOCHEMISTRY (Tate)	Physical & Geochem (Cont.)	Education (Cont.)	Biochem Spec. (Broad) (Sutton)	C & E Workshop	FORENSIC
11.45 a.m.	Presidential Address (Batt)								
12.30 a.m.	LUNCH	BUFFET LUNCH (TRADE DISPLAY SPONSORED)	LUNCH	LUNCH	LUNCH				
2.00 p.m.	SPECTROSCOPY AS A STRUCTURAL TOOL: PLENARIES (Doddrell) (Johnston)	WORKSHOP INSTRUMENT APPLICATIONS	BIOSILTS	Catalysis & Energy (Cont.)	Education Symposium	Q.A. (TELARC)	C & E	FORENSIC?	
3.30 p.m.	Coffee/Tea	Coffee/Tea		Tea/Coffee	Tea/Coffee				
4.00 p.m.	Spectroscopy (Cont.)	Workshop (Cont.)	BIOCHEM ?	C & E (Cont.)	Ed. Symposium	Q.A. (TELARC)			
5.30 p.m.	Dinner	7.00 pm Dinner	Dinner	Dinner	Dinner			Dinner	
7.30 p.m.	Opening Mixer	A.G.M.	CONFERENCE DINNER	(Formal) END OF MEETING					
		8.00 pm Address: Sir G Porter							

BIOLOGICAL AND MEDICAL APPLICATIONS OF GAMMA-LINOLENIC ACID (GLA)

Dr Scott is a graduate of the Otago Medical School. He undertook postgraduate training at the University of London, Royal Postgraduate Medical School and at the University of Birmingham, where he completed his Doctorate in Medicine.

His research interests include lipoprotein metabolism and various aspects of arterial disease. He is Head of the Department of Medicine in the School of Medicine, University of Auckland.



P.J. Scott
Department of Medicine
University of Auckland

Compulsory reading for medical students and medical practitioners who want to be up-to-date, that is to use the latest and best before it ceases to work, must somehow encompass each week the relevant copy of *Time* and the *New Zealand Listener*. The process is aided by studying the *New Zealand Woman's Weekly*, the *Australian Bulletin* and one or two other periodicals specialising in economics, health and education.

Chemists must find it strange that a March 1984 issue of the *New Zealand Listener*¹ contained an article indicating that cholesterol had little to do with heart disease, while in the same week the cover of *Time* consisted of some not particularly attractive fried eggs and a shrivelled bit of bacon, directing readers inwards to what purported to be the final body-blow delivered to the "cholesterol-is-all-bunk" brigade" by the American Heart Association and the National Institutes of Health "Establishment". The medical profession is equally bewildered by the conflicting claims and the situation is not helped when a preparation called "Efamol" containing gamma-linolenic acid (GLA) appears on the scene. The confusion is compounded by items such as the index of a technical information bulletin distributed by Efamol Ltd.² This index states that Chapter 5 is concerned with essential fatty acids and cardiovascular disorders. Chapters 6 to 19, however, related

essential fatty acids to obesity, alcoholism and hangovers, hyperactivity, the premenstrual syndrome, benign breast disease, skin, hair and nail problems, immunity and arthritis, multiple sclerosis, schizophrenia, aging, diabetes, epilepsy and a further Chapter 21 has been added relating essential fatty acids to asthma. Each of the chapters in this brochure follows a common format, ending up with a statement referring to potential clinical use of GLA in the particular syndrome under discussion.

The immediate reaction of a majority of medical practitioners to this type of promotional material is one of rank scepticism. Doctors have heard it all before, from the days of the snake oil vendors onwards. The fact that there is a rational basis to probably a majority of the statements made in each chapter of the brochure, and the fact that the material is referenced fully, is not enough to counteract on its own, the apprehension with which medical scientists greet an apparent panacea. Much of the background theory concerning application of GLA to medical therapy can be attributed to Dr David Horrobin, currently working in Nova Scotia. He addressed the International Conference on oils, fats and waxes in Auckland in February 1983.³ At that meeting Dr Horrobin impressed many of us with his articulate exposition of his theories and by his openness in providing us with written material. Like Prof. Mark

Hegsted, Emeritus Professor of Nutrition from Harvard University, who was also at the conference, and a number of other medically qualified people with some understanding of lipid biochemistry, I was interested in Horrobin's statement that GLA lowered cholesterol levels in patients in which these were particularly high, but had relatively little effect on cholesterol levels in normal people. From what we know of cholesterol homeostasis that would be a surprising phenomenon. The second reservation we had was the absence of rigorously controlled trials of the product. The history of so-called progress in medicine is littered with promising preparations which fail the acid tests of the controlled clinical trial. In general, agents which are alleged to have a specific effect on the abnormal person and little on people within the so-called normal range also tend to fade from the scene eventually.

People who are desperate because of their own health problems or those of their children, are not only entitled to seek relief where they can but, as normal human beings, they in general do just that. This leads them to the doors of well-meaning protagonists of unproven remedies and also to the halls of the charlatans. This sociological phenomenon has a history of many thousands of years at least. The ethical code of the medical profession is such that the process is accentuated rather than retarded in present-day society.

In the setting of GLA this aspect of human behaviour is best seen in the approach to the hyperactive child. In one New Zealand city, it is known that distraught parents have been spending \$50 to \$100 a week providing evening primrose oil for their children whom they believe to be hyperactive. This highlights a potentially tragic situation. The whole basis for hyperactivity remains controversial and one could spend all evening discussing the pros and cons of particular trials and their analyses. As a member of the National Nutritional Advisory Committee, I have had to wade through the literature concerning diet and hyperactivity. My present position is that I do not regard the very honest and ethically sound approach of Dr Feingold to be proven; conversely, it is not disproven either. If one looks at Chapter 8 in the Efamol brochure concerned with essential fatty acids and hyperactivity and checks the references, one finds that of the seven, three refer to the journal "Medical Hypothesis", one is to Dr Feingold's book, one is to an article in "Science" concerning dyes and altered performance of hyperactive children on a laboratory learning test, (in itself a reasonable study), and only one refers to a brief objective view, namely a Lancet editorial of 1979.⁴

That editorial correctly points out that the hypothesis, that evening primrose oil lessens hyperactivity, must be difficult to test because even the state of hyperactivity in childhood is not a precise or recognisable entity. The proportion of children so diagnosed varies widely throughout the world and in parts of the United States is said to involve 3 to 8 per cent of school children. Subjects such as hyperactivity arouse very strong emotions and medical scientists, as the Lancet points out, feel challenged through the speed of public acceptance of an unproven theory.

Let us now consider the application of evening primrose oil to cardiovascular disorders.

There are two key metabolic pathways for essential fatty acids (fig. 1). Essential fatty acids are all polyunsaturated and they belong to two series, the N6 derived from cislinoleic acid, and the N3 series derived from alphalinolenic acid. Both cislinoleic and alphalinolenic acids are biologically inactive and are oxidised to provide energy and to serve as precursors for substances required in a number of key biochemical pathways. Perhaps the most important biological role of essential fatty acids is concerned with the structure and functioning of biological membranes, that is the bi-layer surrounding individual cells and, equally importantly, the membranes of cell organelles, that is components inside the cell, some of which act as structures supporting key chemical reactions. Some of the chemical reactions involve the transmission of messages from the outer cell membrane to the internal organelles of cells, and others are involved in methods whereby cells communicate with one another, such that correct balances are maintained within an individual tissue.

Prostaglandins and leukotrienes are the names given to some short-lived, highly reactive molecules concerned with these processes. These two groups of molecules derive from essential fatty acids. It is at this point that we enter an area of great ignorance and also are confronted with one of the reasons for the tremendous variability in effects between one person and another of varying either dietary balances of essential fatty acids or balances affecting the N3 and N6 pathways. For the N6 pathway arachidonic acid, occupies a key position. Conversely, icosapentanoic acid occupies a similar position for the N6 series.

The substance usually called DGLA (fig. 1) leads only to prostaglandin products and not to leukotrienes. The PGI series of prostaglandins are in general useful compounds which inhibit aggregation of platelets and also act as dilators of blood vessels. They also inhibit inflammatory actions. This triple combination of effects can be envisaged as helpful in preventing some aspects of cardiovascular disease through build-up of inflammatory products and blood clot in both venous and arterial systems. Prostaglandin E1 also aids the body in certain mechanisms designed to combat infection from foreign body influences.

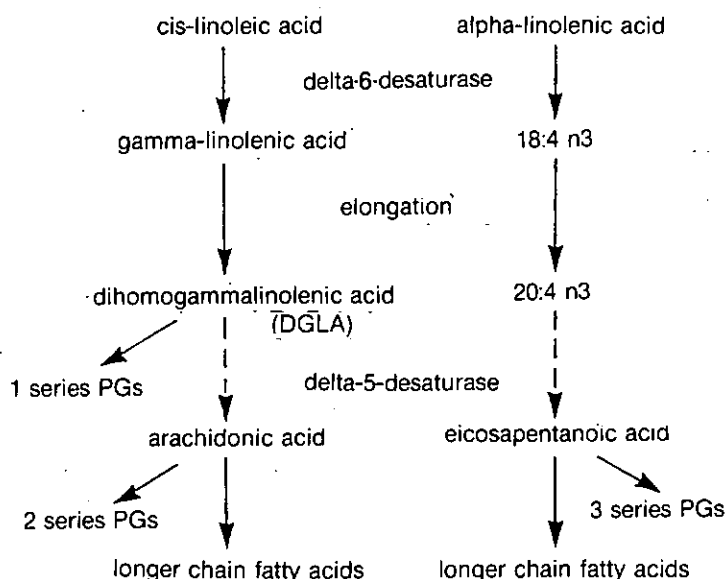


Figure 1

If we move downwards to arachidonic acid on the other hand, the pathways lead in two directions and become quite complicated. The leukotrienes tend to stimulate inflammation which can sometimes be helpful but which can equally be very harmful in some biological circumstances, including aspects of arterial disease. The prostaglandin series derived from free arachidonic acid includes prostacyclin which again inhibits platelet aggregation and aids dilation of blood vessels. On the other hand, thromboxane A2 tends to make blood vessels go into spasm and induces blood clotting and inflammation of blood vessel walls.

There is an interesting therapeutic point here because small doses of aspirin influence the pathway using cyclo-oxygenase such that prostacyclin production increases, whereas larger doses tend also to lead to the production of thromboxane. Since this balance is set differently in different people, extremely complicated problems of analysis arise when fixed doses of aspirin are used in large scale "controlled trials" in cardiovascular disease.

On this background we can consider cardiovascular disease, and thus enter the cholesterol-polyunsaturated fatty acid controversy. Despite the recent article in the *New Zealand Listener*¹, the epidemiological fact of life is that there is a relationship in populations between average cholesterol and coronary-cerebrovascular mortality, that is death from strokes and heart attacks. The precision breaks down when one talks about individuals, indicating again biological variability in terms of the significance of the cholesterol level in a particular person. There is no controversy about the fact that increasing polyunsaturated fatty acids in the diet lowers total serum cholesterol, with the major effect being on low density lipoprotein cholesterol, which substance is highly relevant to the development of atherosclerosis. However, very high concentrations of polyunsaturated fatty acids in the diet are required to lower cholesterol significantly. In contrast, relatively low concentrations of gammalinolenic acid are required to produce a significant fall in low density lipoprotein cholesterol in people whom high concentrations are present. Thus it is suggested that GLA in primrose oil may be bypassing a delta-6-desaturase block based on reduced availability of the enzyme. From that starting point, largely based at present on animal studies, there are suggestions that blood pressure may be lowered, platelet aggregation retarded and blood vessel blockage relieved, by bypassing the delta-6-desaturase block.

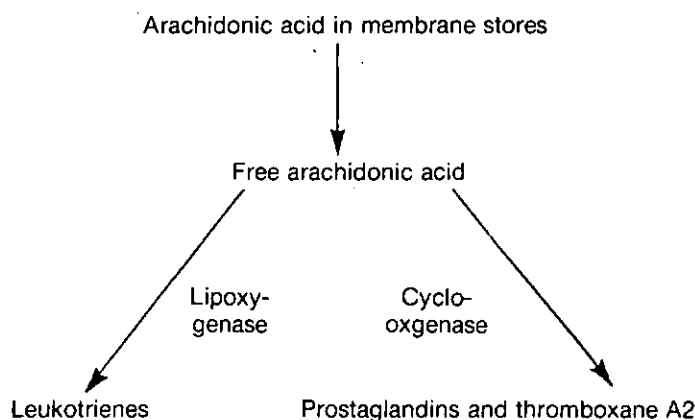


Figure 2

Doses of 2 to 4 grams of Efamol, that is 4 to 8 of the 500mg-capsules available in New Zealand, are well tolerated with virtually no side effects. The theory for using this material in patients with high cholesterol and high low-density lipoprotein levels (hypercholesterolaemia) satisfies biochemical logic and provides an adequate base for testing in humans. However, the use of evening primrose oil in patients with high cholesterol levels and in patients with established arterial disease, must be regarded as experimental and requiring testing under controlled conditions before claims can be made for its efficacy. We are underway with such studies in Auckland and are accepting all the difficulties inherent in such trials. Genuine double-blind placebo trials, in my opinion, are not possible in this situation because we cannot control all the variables, mainly because we do not know what some of the key variables may be. This problem has bedevilled all the recent trials of dietary and drug manipulation of cholesterol levels for purposes of cardiovascular therapy throughout the world. Perhaps ten years from now, by pooling data, we may be in a position to say whether or not evening primrose oil is helpful for these people.

From the starting point of basic biochemistry, Dr Horrobin and colleagues have tested the blood of patients with so-called atopic eczema, a distressing condition which may arise in childhood or adult life, and which is often associated with asthma and other unpleasant conditions.

The word atopy implies the tendency to develop some form of allergy which is inherited, although the particular type of allergic manifestation is not inherited in a predictable fashion; thus patients with atopy may have eczema or hay fever or asthma or a mixture, even although they come from the same family. Horrobin and his colleagues, working in conjunction with physicians at the Department of Dermatology in Bristol, England, found that in young adults with atopic eczema, the

plasma levels of cislinoleic acid were high, whereas those of gammalinolenic acid were low. Thus these patients appeared to have a block in the conversion of cislinoleic acid at the beginning of the N6 pathway through to gammalinolenic acid and were thus deficient in certain prostaglandin precursors. They proceeded to undertake a trial involving 99 adults and children with atopic eczema and this trial was of the classic double-blind crossover format which means that neither patient nor practitioner knew what a particular patient was receiving. Each patient received a placebo and the active agent for set periods, again in random fashion. The study encountered all the usual difficulties with clinical trials of this type. However, the results recorded by the physicians and the patients independently all pointed towards an improvement which was dose-related. The same general trend was noted in children but the findings were less impressive. Interestingly, both doctors and patients felt that there had been some improvement while the patients were on the placebo.⁵

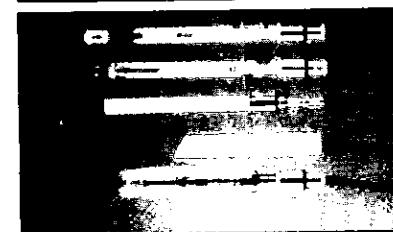
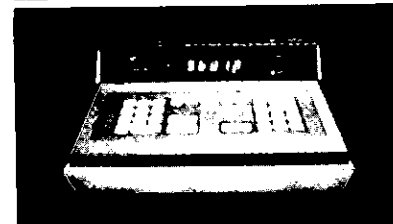
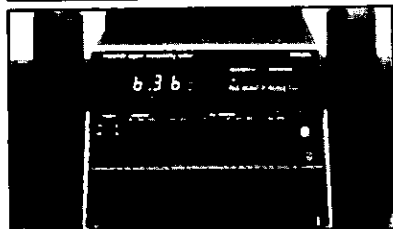
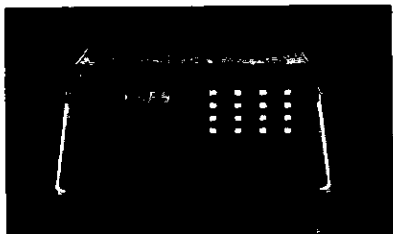
That trial gave encouragement to the basic theory. However, Professor Shuster and colleagues from the Department of Dermatology, Newcastle-upon-Tyne, followed up the work of the Bristol group and treated another skin condition, again with a double-blind involving a smaller number of patients, this time using a single independent observer.⁶ Only 4 patients thought their skin condition had improved and 2 of these were taking the active ingredient and 2 were taking the placebo. In particular, the eczematous changes did not improve amongst the patients taking evening primrose oil. The Newcastle workers used a lower dose than their colleagues in Bristol and also commented that their trial may have been upset by the known seasonal fluctuations in the condition under study. These trials indicate the difficulties which biologists and doctors face in attempting to assess interesting new agents such as evening primrose oil (GLA).

This brief review has attempted to present a biological perspective, not in defense of the obvious ineffectiveness of the medical profession in many important areas of therapy, but rather to stress the difficulties of translating exciting and useful hypotheses into clinical practice. Medical scientists and physicians do not in general regard themselves as overlords determining what a population shall or shall not receive in terms of overall therapy. However, as scientists trained at taxpayers expense and largely supported by the taxpayer, we do have a duty to apply the best possible methods available for assessing efficacy of new hypotheses and preparations. We do have a duty to state our views to the public concerning possible dangers as well as indicating possible benefits from new developments. Efamol is not the brainchild of some crank entrepreneur, but rather is the outcome of genuine scientific enquiry, and its development and application will enhance knowledge in a useful manner. Unfortunately, like any freely available commercial product, it runs the danger of becoming the victim of over enthusiastic application followed by disillusionment for all the reasons I have outlined. A number of medical scientists, including myself, propose to continue using evening primrose oil in a number of situations in the hope that, through pooling information amongst ourselves, we can ultimately establish the place of GLA in therapy.

References:

1. Wright, V. (1984) The myth of cholesterol. *New Zealand Listener*, March 17, 1984.
2. Efamol — Technical Information Bulletin. Efamol Ltd., London, England, 1983.
3. Horrobin, D.F. and Manku, M.S. (1983) The Seed Oil of the Evening Primrose (*Oenothera Biennis*): A New Oilseed Crop. In, *Fats for the Future — The Proceedings of the International Conference on Oils, Fats and Waxes*. Eds. Brooker, S.G. Renwick, A. Hannan, S.F. and Eyres, L. Duromark Publishing, Auckland, pp 99-101.
4. Editorial. (1979) Feingold's Regimen for Hyperkinesis. *Lancet*, ii, 617 and 618.
5. Wright, S. and Burton J.L. (1982) Oral Evening Primrose Seed Oil Improves Atopic Eczema. *Lancet*, ii, 1120-1120.
6. Chalmers, R.J.G. and Shuster, S. (1983) Evening Primrose Oil in Ichthyosis Vulgaris. *Lancet*, i, 236 and 237.

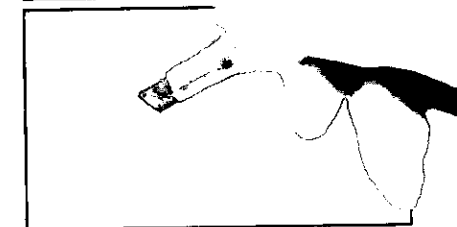
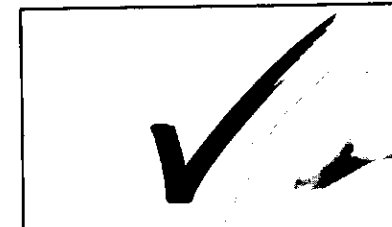
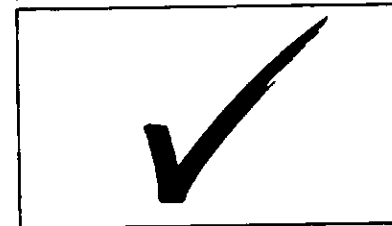
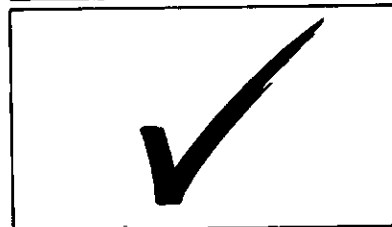
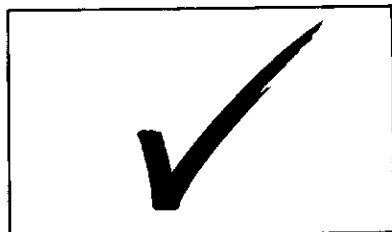
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CHEMISTRY IN 19TH CENTURY NEW ZEALAND

Joan T. Radford
Department of History and Philosophy of Science
The University of Melbourne

This is the second of three parts; the first instalment dealing with Government Chemistry appeared in the April issue.



To cover adequately the contributions of academia to chemistry in N.Z. in the 19th-century, one should cover not only the University of Otago, and the University Colleges of Canterbury and Auckland, but also the work of science masters at secondary schools, of the Schools of Mines and the Agricultural colleges.

However this account deals mainly with Otago, Canterbury and Auckland, using as chief source the records of the University Colleges and the University of New Zealand.

The professorial appointments made for Otago and Canterbury (J. G. Black and A. W. Bickerton respectively) for instruction in chemistry, were made at a period of British chemical development when public interest and education in science was generally increasing, with discoveries in chemistry beginning to accelerate. Thus, appointments made in the 1870's, particularly to the Colonies, were hardly likely to be in pure chemistry — indeed, in both the above Provinces, the appointees were expected to teach subjects other than chemistry, to stimulate local interest in science, to assist both Government and Industry, and to act as local analysts. This they both did, but it is to Black that the greater praise has been given by later historians.¹ The appointment to Auckland University College, was made in the 1880's, by which time Britain had produced a generation of young men experienced and interested in furthering the study of pure chemistry. Also, by this time, the University of New Zealand had been established as an amalgamation of the University Colleges. And its degree requirements had circumscribed the subject matter to be studied, thus setting standards to which the appointment of a Professor of Chemistry must comply. Even so, the professor, F.D. Brown, was expected to teach natural philosophy as well as chemistry and to encourage the development of chemistry in the Province and in its industry. In all three professorial appointments,² both personal character and industrious teaching were expected to be of leadership standard.

Provincial rivalry seems to have stood in the way of co-operation between the professors towards establishing an effective concerted approach to chemical problems in N.Z., e.g. soil, coal and mining chemistry. Teaching rivalry grew stronger after the establishment of the University of New Zealand³ with its prescribed examination requirements, which from 1875 required for the Honours Examination,⁴ detailed study in any one of Chemistry of Minerals, of Manufacture, of Plants and Animals, Chemical Analysis, or one branch of (a) Electricity and

Magnetism, (b) Sound and Light, (c) Heat and Energy, or (d), (b) and (c) together.

Black, at Otago, commenced teaching in 1872, his classes covering chemistry and chemical analysis, chemistry for medical classes, and from 1881 the chemistry of industrial and technological application, for teachers on Saturday mornings and in 1884 special organic chemistry classes for medical students.⁵ In 1880 he was teaching 43 hours a week,⁶ had a paid laboratory assistant and a paid demonstrator, who was usually the scholarship holder in chemistry. Between 1880 and 1896 there were 3-4 changes of Demonstrator-Assistantships, sometimes honorary appointments, with regular promotion and responsibility for his laboratory assistants, Montgomery and Goodlett.

The textbooks used⁷ were Roscoe's "Elementary Inorganic Chemistry", "Elementary Lessons in Chemistry for Medical Students"; Fowne's "Manual of Chemistry" and Thorpe's "Qualitative Analysis".

Black gained Government favour from his ready co-operation in delivering (paid) lectures to the miners on the gold fields, and his publication of "Chemistry for Mine Fields". His lecturing style has been described as brilliant, but brilliant **chemist** he was not. There is nothing original in the text, and detailed examination of the archival records of the University of N.Z.⁸ uncovers no honours theses or examiners' reports which show either originality or careful supervision, although the Otago results for both pass and honours candidates are strictly comparable with those of the other colleges. Black's chemistry classes included women from at least 1873,⁹ and the honours candidates, too, included women.¹⁰ Although Black was appointed with the intention that he should teach agricultural chemistry, he was not very active in this area,¹¹ though in 1899, with Bickerton, he wrote an introduction to a book on Practical Irrigation,¹² writing as though an expert on the role of moisture in plants. As expected in his terms of appointment, Black in 1872 acted as Surveyor of Stewart Island¹³ and as Provincial Analyst for industries in the Province.¹⁴ He was chemical adviser to Kempthorne Prosser (eventually acting on the Board of Directors),¹⁵ and his industrial chemistry lectures of 1893 covered brewing, soaps, manures, dyeing and foundry works.¹⁶

Much has been made of the fact that Mellor, the status 1851 Exhibition Scholarship holder of 1898, and later eminent world-famous ceramic chemist, was one of Black's students. But how much of the supervision and stimulation came from Black, and

how much from the other staff and from G.M. Thomson?¹⁶ The British examiner's report on the thesis was quite outspoken on its defects.¹⁷ Black made no contribution to British chemical journals, nor to the N.Z. Institute. He carried out all the duties with which he was charged on appointment quite superbly, but could hardly have been said to have contributed significantly to chemistry as a science.

Leaving Otago for Canterbury we come to the performance of the much criticised Professor A.W. Bickerton. Appointed in 1874 with conditions of appointment similar to those of Black in Otago,¹⁸ he was expected to lecture in natural philosophy as well as in chemistry and agricultural chemistry. Even for 1874, this was a demanding task. Bickerton brought with him an assistant whom he personally selected, George Gray, who later became the lecturer in agricultural chemistry at Lincoln Agricultural College, taking a heavy load of analysis of soils and waters, as well as lecturing in theoretical and practical chemistry.¹⁹ Gray was replaced by Samuel Page who gave the laboratory instruction to students ranging in numbers from 6 to 61; lecture attendance in the period 1878 to 1894 varied from 22 to 121.²⁰ There was also a lab-boy whose task it was to clean both apparatus and laboratory. Bickerton, continuing his British practice, soon introduced enthralling public lectures to the Christchurch community demonstrating his proficiency in design and manipulation of the spectacular aspects of both chemistry and physics,²¹ and showing true ability in the instruction of those un tutored in science. His hours of formal teaching were less than Black's, though it was revealed during the public enquiry into his department in 1894²² that he had the gift of inspiring the young, and of recognizing ability and genius in those students capable of independent work. His true love was in philosophizing on stellar impact and energy transfer, and his experimental delight was in the practice of electricity. Had there been less inter-college rivalry it is possible to imagine co-operation between McLaurin and Brown in Auckland, Skey at the Colonial Laboratory, and Bickerton, in developing electrochemical theories well ahead of the rest of the world, during the practical attacks being made upon the retrieval of gold from wastes and tailings.

Within chemistry itself, Bickerton presented organic chemistry in a novel and successful manner.²³ Results in the Honours Examination of University of N.Z., reveal a high proportion of H1's from Canterbury in organic chemistry whenever it was chosen as specialty.²⁴ Bickerton, like Black, acted as Provincial Analyst, and gave greatly appreciated help to local industries, including Belfast Chemical Works and its ammonia distillery, iron foundries, brass foundry and gas works.²⁵

Both Otago and Canterbury supplied their chemistry professors with laboratory space and facilities, which, if not ideal, were at least adequate initially. Auckland, on the other hand, appointed its Professor in 1883 to apallingly inadequate working conditions.²⁶ The conditions of appointment were equally demanding, but did not include Provincial Analyst requirement. Though made primarily on his experience in chemistry (he had engaged in research in G.B.),²⁷ he was expected to teach physics,²⁸ too. He had brought with him an assistant, Mr Arthur Bowell,²⁹ who was able, loyal and trustworthy, remaining with the Chemistry Department until 1933.

Brown's more recent personal experience of chemistry in Great Britain enabled him to give advice to the Senate of the University of N.Z. on examiners for Honours Scholarships and Exhibitions,³⁰ when the British examiners had finally refused to examine because of inadequate payment by the authorities.³¹ Brown carried out his duties to the various years of the chemistry courses, both Pass and Honours, assisting always in the local choice of scholarship students to the College. His endeavours were rewarded by the high proportion of graduates from the University of N.Z. who had been trained at his college. When the 1851 Exhibition Scholarship was first offered to a candidate from N.Z. it was his student D.H. Jackson to whom it was awarded for work on the reactions of gold.³² The report on the thesis was not enthusiastic, but the Commissioners recommended him for it provided he spent a period in an authorized research laboratory before leaving for Great Britain. Jackson therefore went first to Melbourne to work in Masson's

laboratory, where he changed his topic to hyponitrites, which work was continued in Britain, before Jackson went to Heidelberg. The Commissioners were not impressed by Jackson's performance³³ attributing his lack of success to unwise supervision and to lack of initiative and self-reliance.³⁴

Two years later, J.S. Maclaurin, continuing the topic which Jackson had dropped, submitted a thesis which gained him an 1851 Exhibition³⁵ which he was forced to refuse for financial reasons, returning to work with the local analyst J.A. Pond, to whose assistance and direction he was indebted as much as to Brown, for his mastery of "The dissolution of gold in cyanide solutions, under oxidizing conditions."

As Professor Briggs so rightly pointed out in 1952,³⁶ Auckland owes a great debt to Pond, who helped so much to make Auckland's chemical climate so different from that of the other Provinces. Professor Brown became involved in advice to industry, particularly the Auckland Gas Company,³⁷ later serving as Chairman of Directors. But he seems to have been more closely involved with the life of the city than were either Bickerton or Black, probably through his close and active involvement with the Auckland Institute and Museum. He, like Black, took an active interest in the Thames School of Mines, having the firm opinion that the general lectures delivered by Black would be of little value unless supported and sustained by other following lectures.³⁸ It seems certain, too, that like the other professors, he was so heavily involved with teaching, examining and advising industry, that he had little time to prosecute further research of his own. Yet it is obvious from later work, that a field of natural products chemistry unique to N.Z., was ready and waiting for investigation to which his experience in fractional distillation could have been valuable.

He lectured to teachers on Saturday mornings,³⁹ a practice he thought unfair to the already tired students. He drew several of his Honours students from the Thames School of Mines, and was ready to advise on agricultural problems if they were brought to him. After his retirement his Chair was filled by one of his own students, as Bickerton's had been filled by one of his own students, and Black's by one of Bickerton's.⁴⁰

Hence, although the professors in the 19th Century did not make great individual contributions to the science of chemistry, they trained students who did and who eventually brought back to their country knowledge gained outside it. The inhibiting role of the University of N.Z. has been written about already⁴¹ and implied, but it would be of value to the history of N.Z. science if the titles of theses could be firmly established and assigned to individual candidates, at last released from the anonymity of *nom-de-plumes*.

Agricultural chemistry, taught at Lincoln from 1880, was presented in standard courses in soil, pasture, plant and fertilizer application, under the tuition of Ive, Barkas and Gray. But following the visit to the colony in 1881 of R.W.E. Mclvor, the chemists became aware of the increasing scientific knowledge and value of ammonia fertilizers, whence staff and courses gained impetus from the public lectures he delivered,⁴² and the fertilizer industry gained its chance to prosper.

Footnotes:

- (i) F.G. Soper and H.N. Parton, "Chemistry in the University of Otago" (initiated by Otago Branch of N.Z. Institute of Chemistry, sponsored by Bank of N.Z.) about 1974.
- (ii) H.N. Parton, "History of the University of New Zealand — the last phase". Auckland 1979.
- (iii) Thompson, G.E., "A History of the University of Otago, 1869-1919"
- (iv) McLintock, "History of Otago".
- (v) N.Z. Institute of Chemistry and Royal Institute of Chemistry, "Chemistry in the Development of N.Z. Industry", 1942.
2. Conditions of Appointment to the positions — all retained in the archival records of the appropriate Universities and Colleges.
3. As 1 (ii).
4. University Archives, Dunedin: Professorial Board Minutes 1875.
5. University Archives, Dunedin: Professorial Board Minutes 1884.

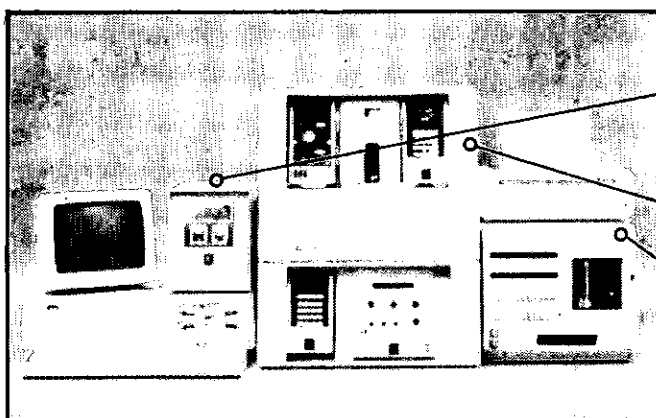
6. University Archives, Dunedin: Inward Letter Book 1880-1881. September 1880, "Re-Regulations for Chemistry Laboratory".
7. University Archives, Dunedin: Professorial Board Minutes — various places.
8. Details of these were held at the National Archives at Wellington.
9. University Archives, Dunedin: Inward Letters, 1873.
10. e.g. 1892, Catherine Ferguson H.3.
11. University Archives, Dunedin: Inward Letters to Registrar 1893 and "Lectures on Agricultural Chemistry", Government Printer, 1895.
12. John McKeague, "Practical Irrigation", Ashburton, 1899.
13. Report of J.G. Black to Commissioner of Crown Lands, 1872.
14. University Archives, Dunedin: Inward Letters 1880: Coal, Vinegar Assays; 1882: Oleine Oil; and Council Minutes 1873, re Fees as Government Analyst being £125 p.a.
15. John S. Dennison, "History of Chemical Industry in Otago up to 1914", thesis, 1948.
16. University Archives, Dunedin: Inward Letters to Registrar, Nov. 1893.
17. (i) A.H. Reed, "Joseph William Mellor", p.3, Dunedin 1957. (ii) Eve to University of N.Z., Nov. 20th, 1898: National Archives, Wellington.
18. Report on Special Committee of Enquiry into the Department of Chemistry and Physics, 1895, p.2, point 6.
19. Report to General Assembly 1889 — E7A, "Concerning Education in the School of Agriculture".
20. As 18. Appendix VI, p.87 and Appendix III, p.85.
21. As 18. Appendix VIII.
22. As 18, pp 92-98 and pp. 8, 11, 14 and 17.
23. As 18, pp. 23 and 52.
24. Senate Minutes of University of N.Z. Reports of Results and Appendices to H. of R. Journals 1892 and 1894.
25. As 18, pp. 53, 55, 56 and 70.
26. Brown to Uni. College Administration, Aug. 8th, 1883: Complaints re conditions of laboratory.
27. "Appointment of Professors". File of Uni. Coll. Auckland listing 4 joint and 8 sole authorship papers — mainly on Distillation.
28. L.H. Briggs, "Looking back on N.Z. Chemistry", Auckland 1952.
29. As 28: An address to Auckland Institute. Copy in Auckland University Chemistry Department records.
30. University of N.Z.: Outward Letters 1895 and Letter 826 of May 12th, 1898, National Archives, Wellington.
31. 1882 — All British examiners, Carleton, Carpenter and Moseley considered payment too low. Uni. of N.Z. Archives, Box 10/12.
32. Uni. of N.Z. Senate Minutes 1892, p.62: Exact title not reported.
33. Report on work submitted by David Hamilton Jackson during three years' tenure of a Science Research Scholarship 1892-1895: from the Commissioners' of the Scholarships, 1896.
34. Ditto.
35. University of N.Z. Outward Letters, 27 March 1895: Brown to Exhibition Commissioners. Uni. Archives Box 10/29.
36. As 28.
37. As 28. Section on Auckland University College.
38. N.Z. Herald, October 23rd and November 3rd, 1885; and July 22nd, 1887.
39. Auckland University College Letter records: August 1886 and May 1887.
40. To Auckland University College: F.P. Worley; To Canterbury University College: W.P. Evans; to University College, Otago: J.H.K. Inglis.
41. As 1 (ii) and Beaglehole, J.C., "The University of New Zealand — An Historical Study", Wellington 1937.
42. See Brett's Colonial Guide — "Cyclopaedia of Useful Knowledge", Auckland 1883. pp 1-200, Section on The Farm by Thos Allen; pp 132-142. 1921, "Chemistry of the Farm" quotes W.E. McIvor, lecturer on Agricultural Chemistry and his work on artificial manures.

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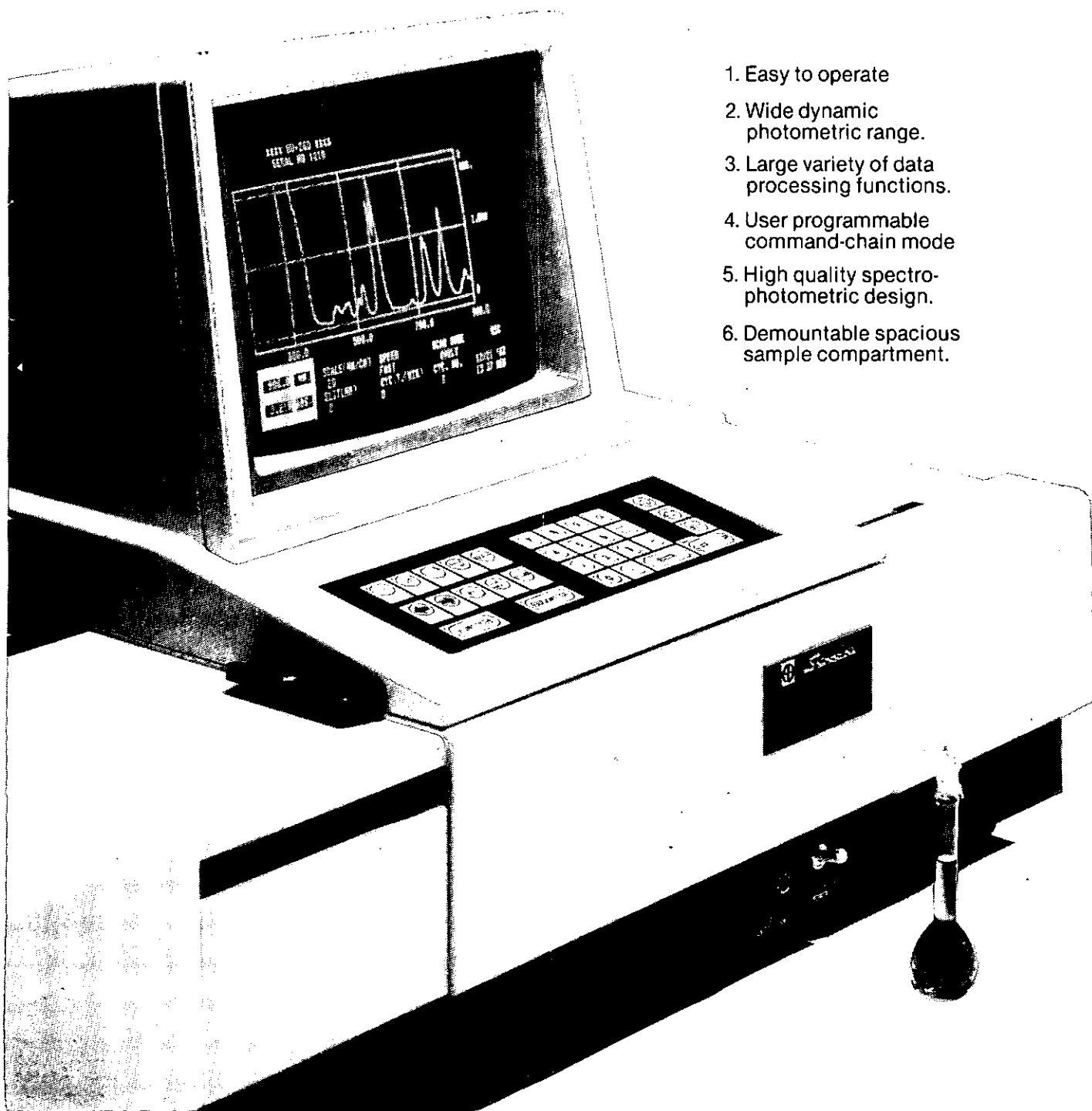
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COUNCIL NEWS

Professor R.D. Batt presided over a telephone meeting of Council's Standing Committee on 8th May in which Mr Hogan, Drs Baker and Rogers participated.

Prizes

The Registrar advised that no entries had been received for the Easterfield, Shell and Essay Prizes. It was resolved to extend the closing date for entries for these awards to 30th June. Branches will be asked to advise their members of this.

The conditions of the Arthur C. Kennett Memorial Award appear elsewhere in this issue. Members are reminded that entries close on 31st July 1984 with the President, New Zealand Branch, Australasian Corrosion Association, P.O. Box 5961, Wellesley Street, Auckland.

Grades of Membership

The President and Dr Baker have prepared a paper outlining possible rationalisation of the present non corporate grades of membership. This document is to be circulated to Branches for discussion and comment prior to its consideration in August by Council.

Publications

Dr Bruce W.L. Graham of the Environmental Laboratory, Department of Health, Auckland, was appointed Editor of "Chemistry in New Zealand" from the June 1984 issue.

Professor Batt agreed to write to Tony Herd, the retiring Editor, expressing the appreciation of Council and the Institute of the development of "Chemistry in New Zealand" which Tony, the Editorial Committee and the publisher were achieving.

Grants for Student Travel

Grants of \$500 to each Branch to assist student members to attend NZIC and other approved conferences in 1984/85 were confirmed. This programme was established last year.

Science Plan

Branches are to be asked to consider the Science Plan recently published by Dr Shearer, Minister of Science and Technology. This document will be discussed by Council at its August meeting in Wellington with the object of developing ways in which the Institute can contribute to its development through informal and formal consultation.

ACS Invitations

Professor R.W. Parry established a precedent when he visited New Zealand in 1982 while holding the office of President of the American Chemical Society. Professor Parry has been working on proposals for an exchange of chemists between the U.S. and New Zealand which were discussed during his visit. These were discussed further during the visit of Professor Fred Basolo last June. Professor Basolo was the second President of the ACS to come to New Zealand.

To explore the possibility of setting up such exchanges on a longer term basis the American Chemical Society has invited Dr D.E. Wright, who was NZIC President at the time of Professor Parry's visit, and the 1984 President of NZIC, Professor R.D. Batt, to visit USA in 1984 as its guests and to speak at about seven places including Washington DC, over a two to three week period.

Dr Wright, who will be in USA on MAF business during November/December has agreed to accept this invitation which does not cover the round trip air fare from New Zealand to Los Angeles or San Francisco. Professor Batt who may also be visiting USA later in 1984 on a People to People International Programme has also agreed to accept this invitation subject to

funds being available from NZIC or other sources for the trans-Pacific air fares.

Tie and Scarf

Members are reminded that orders for NZIC ties and scarves should be placed with their Branch Secretaries.

THE ARTHUR C. KENNETT MEMORIAL AWARD — CONDITIONS

(Sponsored by the Australasian Corrosion Association and the New Zealand Institute of Chemistry)



The late A.C. Kennett

Mr Arthur Kennett was a very active member of the Australasian Corrosion Association and of the New Zealand Branch in particular for many years. He was Australasian President in 1975/76.

In his professional life, he was extremely interested in the degradation of non-metallics and published a book on the "Degradation of Plastics" shortly before his death in 1983.

The Association, at the behest of the New Zealand Branch, has decided to commemorate Arthur's work and life interest by awarding the Arthur C. Kennett Memorial Award each year to the best paper presented under the auspices of the Association and dealing with non-metallic corrosion. The Award will be granted annually provided works of suitable standard are presented, and it is hoped that the Award will encourage papers in this field of corrosion mitigation. The New Zealand Institute of Chemistry (Inc) of which Mr Kennett was an active Fellow has joined with the Association in sponsoring this Award.

This Award shall be a Certificate and a sum of money (not less than \$NZ200) intended for the purchase of books. The value of the prize will be determined annually by the Adjudication Panel. The New Zealand Branch of the Association shall administer and manage all aspects of the Award. It is planned that the first such Award shall be made at the 1984 Annual Conference at Rotorua, New Zealand.

The rules governing the granting of the Award are as follows:

1. For a paper to be eligible for consideration, it must have been presented at a technical meeting, seminar, or Conference run under the auspices of the Association solely or jointly with another learned society or published in the Association's Journal during the twelve months ending on July 31, of the year in which the award is made.

2. The Judges may allow a degree of discretion in the subject matter of the papers submitted, but to be eligible for the Award the key aspects of "corrosion" and "non-metallic materials" must dominate.
3. Application forms will be available from the New Zealand Branch through the Branch Secretaries and will provide space for the following data:

Title of Paper

Author(s) Name(s) and Address(es)

Where and when presented and Branch responsible for the presentation event.

Space for verification of details by an Officer of the appropriate Branch.

Signature of nominee.

Applications together with the text of the paper and a synopsis shall be sent to the Secretary, New Zealand Branch, Australasian Corrosion Association, P.O. Box 5961, Wellesley Street, Auckland, New Zealand.

4. The Adjudication Panel shall be the persons filling the offices listed below in the period immediately before the granting of the Award:

The Australasian President, Australasian Corrosion Association.

The President of the New Zealand Branch, Australasian Corrosion Association.

The President of the New Zealand Institute of Chemistry or his representative.

The Convenor of the Technical Committee of the New Zealand Branch.

The decision of the Judges shall be final.

6. The Award will be confirmed by the Australasian Council at its Annual Meeting held in conjunction with the Annual Conference and will be presented normally, at the Conference Dinner.

(Note: It is hoped to make the first award at the ACA's conference in November. As this is the first time the award is being offered, rule No 1 may be relaxed slightly to ensure an adequate response. Presentation/publication of the paper should at least be imminent. — Editor).

General Secretary's Visit to Chemical Societies in UK, Thailand, Malaysia, Singapore and Australia

Dr Rogers reported briefly on his discussions with Dr R.D. Guthrie, Executive Secretary, Royal Society of Chemistry, in London, Professor Kamchorn Manunapichu, Chemical Society of Thailand, in Bangkok, Dr M. Mohinder Singh, Institut Kimia Malaysia, in Kuala Lumpur, Professor H.H. Huang and Dr K.Y. Sim in Singapore and Mr J.R. Warby, President, RACI, in Sydney, en route to and from a March assignment in Pakistan. A report was made to UNIDO in Vienna early in April. The visits to Bangkok and Malaysia were the first personal contact NZIC has made with these members of the Federation of Asian Chemical Societies.

Members of the NZIC who are travelling through Asia are invited by the Chemical Societies there to consider stopping over to meet and talk with colleagues there. Funds are available to pay the local costs of such visits.

Forum — Planning for Hazardous Activities

The Institute is to be represented by Mr R.H. Hoggood at a forum arranged by the Planning Department of the Auckland Regional Authority 24/25 May at the University of Auckland's Conference Centre to discuss Planning for Hazardous Activities in the Auckland Region. Raymond Hoggood is a corresponding member of Council's Hazardous Chemicals Committee.

Dr Wayne Temple, Chairman, and the Otago members of the Committee, have been studying the 250 page report which is to be discussed at the Forum and may contribute submissions in writing.

MEMBERSHIP

Applications for the following grades were approved:

Fellow:

Brittain, Thomas, BSc PhD (East Anglia), Dept of Biochemistry, University of Auckland. (Snr Lecturer).

Nottingham, Peter Maxwell, MSc (NZ) PhD (Aberdeen) FNZIST, M.I.R.I.N.Z., PO Box 617 Hamilton. (Head, Science Divn.).

Member:

Dengate, Howard Norman, BSc PhD (Canterbury), Wheat Research Institute, Christchurch. (Scientist).

Dowrick, Noel Campbell, BSc Dip Ed. Correspondence School, Wellington. (Snr Chemistry Teacher).

Grasse, Frederick Richard, BSc (Hons) PhD (Birm), Chemistry Divn. DSIR, Christchurch. (Scientist).

Hamilton, Iain Gilbert William, BSc. Shell Chemicals Ltd, Wellington. (Tech. Service Officer).

Owers, William Ronald, NZCS (Chemistry & Metallurgy), Industrial Processing Divn. DSIR, Petone. (Snr Tech. Officer).

Perry, Nigel Brian, BSc (Hons) (Bristol) PhD (Otago), Chemistry Dept, University of Canterbury. (Post Doctoral Fellow).

Tasker, Steven Maxwell, BSc. Peterson Chemicals Ltd, Wellington. (Chemist).

Graduate Member:

Armstrong, Guy P. BSc. Medical School, University of Auckland. (Student).

Campbell, Christopher Michael, BSc. NZ Aluminium Smelters Ltd, Invercargill. (Potroom Devel. Engineer).

Dolan, Laurence Patrick, BSc. Chemistry Dept University of Canterbury. (Student).

Gray, Michael John, BSc (Hons) (Canterbury). National Radiation Laboratory, Christchurch. (Scientist).

Hamer, Yvonne, BSc. Chemistry Divn. DSIR, Auckland. (Scientist).

Jack, Miss Elizabeth Jane. BSc (Hons) (Wellington), Victoria University, Wellington. (BRANZ Research Scholar).

McDonald, Hamish, MSc (Auckland). Wellcome NZ Ltd, Auckland. (Quality Control Officer).

Sinclair, Martin Douglas, BSc (Hons) (Wellington). Chemistry Dept. Victoria University, Wellington. (Student).

Tapp, Neville John, BSc (Hons) (Otago), Chemistry Divn. DSIR, PB Petone. (Scientist).

Thompson, Murray Bruce, BSc. Tokomairiro High School, Milton, South Otago. (Chemistry Teacher).

Student Member to Graduate Member:

Graham, Philip Brand, BSc (Hons) (Otago). 78 Fairburn Rd, Otahuhu, Auckland. (Chemist, R & D Lab.) N.Z.F.F. Co Ltd.

Gregor, Miss Jan Elizabeth, BSc (Hons) (Canterbury). Chemistry Dept. University of Canterbury. (Student).

Whitling, Stephen Charles, BSc (Hons) (Canterbury). NZ Forest Products, Tokoroa. (Chemist).

Graduate to Member:

Dacombe-Bird, Paul William, BSc (Hons) (Wellington), Wilton Instruments Ltd, Wellington. (Technical Rep.).

Ellis, Phillip Anthony, NZCS BSc. Middows Taylor Ltd, Auckland. (Chief Chemist).

Fenton, Diana Marie, MSc (Auckland). Abels Ltd, Auckland. (Research Chemist).

Gravatt, Gary Lance, BSc. Dip. Tchg. Chemistry Dept. University of Auckland. (MSc Student).

Rogers, David Alan, MSc. PhD (Auckland). NZ Fertilizer Man. Res. Assn, Auckland. (Scientist).

Seadon, Jeffery Keith, MSc (Auckland), Auckland Grammar School. (Chemistry Teacher).

Templeton, Matthew David, BSc (Hons) (Otago). Dept of Biochemistry, University of Otago. (PhD Student).

Webber, Rona BSc. School of Medicine, University of Auckland. (Technician).

Williamson, Bryce Elliott, BSc (Wellington) PhD (ANU). Chemistry Dept, University of Virginia. (Post Doctoral Fellow).

Associate to Member:

Wallaart, Johannes Christiaan, NZCS. NZ Aluminium Smelters Ltd, Invercargill. (Laboratory Supervisor).

Technician to Associate Member:

McArthur, Gordon Keith, NZCS. NZ Industrial Gases. Lower Hutt. (Chemist).

McDonald, Nicholas Charles, NZCS. Arnott's Ltd, Milling Divn. Homebush, NSW. (Chief Chemist).

Moore, Anthony John, NZCS NZ Dip.Chem. Dental Res. Unit, MRC, Wellington. (Snr Technician).

O'Donnell, Peter, NZCS. Winstone Plastics, Palmerston North. (Quality Control Supervisor) M.C. rec Assoc. from Dec 1983.

Technician Member:

Debenham, Neil, NZCS. (from Student) Revertex Industries Ltd, Penrose. (Technician).

Harper, Christine Joy, NZCS. NZ Industrial Gases Ltd, Lower Hutt. (Technical Gases Specialist).

Life Membership: Miss B.J. Levien (O/S), R Malthus (Otago).

Resignations: J.G. Buchanan (O/S), Mrs D.O. Chen (Otago), R.I. Hall (Waikato), M.J.A. McGrath (Otago), B.R.J. Seymour (Canterbury), R.F. Tasker (O/S).

Off: (gone overseas, no address) M.J. Spencer (Wellington).

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CONFERENCE POSTER PREPARATION AND PRESENTATION HINTS

David Bibby and Graeme Gainsford of the 1984 Conference Committee, provide some useful tips on poster presentation.

Introduction

Poster sessions are now an accepted part of any conference and if well done can be an extremely acceptable alternative to the formal conference lecture. However, to prepare an informative and eye-catching poster requires considerably more effort than does the hurried sketching of a few overhead transparencies for the 15 minutes of "monologue" that all too often passes for a conference talk.

The following notes have been put together with the aim of helping you, the poster contributor, to draw a larger audience and hopefully, to improve the status of poster sessions. Who knows, they may even help you to win a poster prize this year.

Content

First consider if your material is really suitable for poster presentation. If you need to give an excessive number of facts or pages of particularly subtle arguments, you will probably attract only a faithful few, who probably know your work in exhaustive detail anyway.

Title

This should be **BOLD and INFORMATIVE**. Full names and addresses will help other conference members to contact you if they do not manage to see you during the poster sessions.

Personalize your poster by adding photographs of all the authors, and not just passport size either. Possibly put the title in after you have completed your lay-out, when you can consider the use of any awkwardly-shaped remaining space.

Ordering of Material

Material should be arranged in an obviously self-consistent order. You will not be physically present by your poster all the time so it must be

able to stand up to the competition on its own! A short introduction and conclusion can be helpful to those unfamiliar with your work. Colour can maximise the clarity of your diagrams and tables, and can add considerably to the attractiveness of your poster.

Text and Tables

While a tastefully-arranged minimum of text and tables may appeal to your aesthetic sense, science usually requires a reasonable amount of substance. These conflicting requirements have to be satisfied as best possible but do remember that it is **not** essential for all the space allocated to be used: close packing is for crystals not readers! Be succinct, but not to the point of incomprehensibility.

Handwriting can be perfectly acceptable if it is neat and well done, but these requirements are apparently beyond the abilities of most scientists. Normal typescript is generally considered to be too small to read, although if you are only expecting one or two readers at a time you may manage. However, "Orator-type" is significantly larger and does look quite reasonable. You may prefer to use photographic enlargement or a magnifying photocopier on your text. In this case you can play tricks with colour. Remember that type faces are designed to look good only over a certain size range and that some are unattractive when magnified. Letraset lettering is probably the best and is extremely flexible, but preparing text with it is a slow process.

Tables should be kept to the absolute minimum and be as short as possible, no more than 4 columns with 4 listings per column.

Diagrams and Figures

These are superior to both text and tables, but remember the fairly obvious rules regarding the minimum acceptable line width (2mm), the maximum number of curves to a graph (3 or 4), and to use colour coding where possible,

particularly if curves cross. Use the minimum of labelling of curves and axes consistent with clarity. With Letraset, photocopiers and computer graphics even the most incompetent should be able to produce an attractive poster.

Extras

Consider adding some samples of products etc. to your poster. If your work requires models, stereo viewers, analysis of stone-age artifacts, etc. then bring them along for display (size permitting). If this is part of an ongoing project with previous publications then have reprints available. Also, why not prepare a limited number of handouts for those who would like a more permanent record of your work?

Setting-up

Make sure you know the dimensions of the space allocated for your poster: do not rely on the organisers to have an infinite supply of "blue-tack", thumb-tacks, glue, sticking-tape, felt pens, etc.

If you have access to anyone with a flair for presentation then use them — and have the good manners to acknowledge their help on your poster.

Do set up your poster before the conference, and then let your colleagues, family, friends, and even enemies, look and criticize before it goes on public view: amazing improvements can result.

If you are proud of your efforts, and, in any case, for your own records, take a photograph, particularly if your poster is next to an obviously sub-standard effort.

Finally, while a poster is a lot of work it need not be disposed of straight after the conference (even if it doesn't win a prize). Most departments and laboratories have some unused wall space — usually painted some drab and murky colour — so why not brighten the place up a little and give your students/visitors/colleagues something worthwhile to look at?

GENERAL NEWS

IUPAC REPORT —

COPOLYMER NOMENCLATURE

The IUPAC Commission on Macromolecular Nomenclature has published a document on "Source-Based Nomenclature of Copolymers."

The report offers nomenclature recommendations intended to provide a systematic source-based procedure for naming copolymers of several different types, including the major varieties of copolymers encountered in industry and in research.

Copolymers are classified as unspecified, statistical, random, alternating, periodic, block, or graft, according to the characteristic sequence arrangement of the monomeric units within the polymer molecules, and a corresponding connective or prefix is included in the name to specify this aspect of structure. The component monomer names can be in the trivial, semi-systematic, or systematic form. Provision is made for the naming of terminal units and of connecting units between segments. It is also possible to express molar masses or degrees of polymerization of segments, as well as mass fractions or mole fractions of monomeric units, by means of a short addendum to the name.

Research workers in this field, who want to argue their personal views on nomenclature before the Commission, are requested to contact, in the first instance, R. Schoenfeld of the *Australian Journal of Chemistry* at (03) 418 7317 or at P.O. Box 89, East Melbourne, Vic. 3002.

NEW STANDARD FOR LAMINATED PLASTICS

Decorative laminated sheet plastics based on thermosetting resins is another way of describing what most New Zealanders call formica.

SANZ has just adopted an international Standard dealing with the material. The new Standard (NZS 7607S) consists of two parts: Part 1 Specification and Part 2 Determination of properties.

The move to adopt the Standard was prompted by manufacturers who wanted to operate under an 'S' Mark licence. Because licences can only be issued for adherence to New Zealand Standards, it was a necessary step to adopt the ISO document which is up to date and relevant. NZS 7607 supersedes an outmoded New Zealand Standard, NZS 2224.

A New Zealand amendment will be incorporated in the new Standard, but SANZ Senior Standards Engineer, Jim Moore, says it involves no changes to the technical content of the ISO Standard.

The same international Standard has been adopted by BSI for use in the United Kingdom.

Copies of *NZS 7607 Plastics — decorative laminated sheets based on thermosetting resins* are available from the Sales Section, Standards Association of New Zealand, Private Bag, Wellington.

Price: Part 1 \$16.90 Part 2 \$48.90.

IWD SPEAKS OUT

Everyone involved in the pesticide industry should make sure they are "squeaky clean" when it came to the safe handling of their products, according to the general manager of Ivon Watkins-Dow, Mr Jim Plunkett.

Mr Plunkett was speaking in Christchurch at the opening of a new warehouse complex for Ivon Watkins-Dow.

For those in the pesticide business safety was an essential part of the industry, he said.

"A small vocal minority of our urban brothers are quite simply anti-pesticides and often anti just about everything else too, quite regardless of the impact and consequences of such an attitude on the rest of the population."

He said that IWD's one gram per day of total phenoxies leaching into the environment at Waireka and the way it was handled, provided good evidence of the lack of balance to be expected from the vocal minority.

The success of IWD over 40 years had been achieved not only through excellent products, but also through the company's concern for people and the excellence of its staff.

"We are particularly proud of our industrial safety performance. We have recently again been identified by the Accident Compensation Corporation as leaders in our industry, and we have recently received national recognition for our in-house road safety programme. We are also proud of our 24-hour emergency response system."

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NEW FACILITIES FOR CHRISTCHURCH CHEM DIV AND WHEAT RESEARCH

Towards the end of 1983 both the Wheat Research Institute and Chemistry Division moved into new facilities in the Ilam Research Centre on the university campus. The centre was officially opened by the Minister of Science earlier this year. The history and work of the two groups is described below.

CHEMISTRY DIVISION

Beginnings

The Christchurch Branch of the Dominion Laboratory was established in 1925 with Mr F.J.T. Grigg as Government Analyst. An Auckland branch had been established in 1924 and Dunedin followed in 1927. The branches were established to cope with the increasing demand for analytical services by Government Departments, particularly for perishable foodstuffs by the Department of Health, and for "on-the-spot" assistance to the Police. The name was changed to Chemistry Division of DSIR in 1964.

Accommodation

Mr Grigg began in the Government Buildings behind the Cathedral in Worcester Street, in one room and two converted lavatories. He soon had the assistance of a cadet, but demand for analytical services began to outstrip the accommodation. As a "temporary" measure, Mr Grigg's facilities were extended by a two-bench laboratory and an office built on the roof.

Over the next 50 years, there were several additions to, and re-arrangements of, the roof-top "Po-lite" clad rooms, each achieving a little relief for the steadily growing work force and equipment. In 1973 the Dunedin Branch was closed and the whole of the South Island was then serviced from Christchurch, increasing the pressure on the laboratory. Sketch plans were completed for new accommodation in a DSIR building to be shared with Wheat Research Institute adjacent to the University of Canterbury campus at Ilam.

The Government Analysts

In 1947 Mr Grigg was succeeded by his former cadet and scientific associate, Mr N.P. Alcorn. Mr L. Wilkinson was appointed Government Analyst in 1971 but died in office after only 18 months. Mr G.R. Scott, formerly Government Analyst for Otago and Southland, was appointed as Government Analyst for the South Island, and on his retirement in 1981, was succeeded by Dr J.M. Robertson.

Functions

As in 1925 the work of the Government Analyst's laboratory is firmly based on the needs of the community it serves. Provision of scientific advice and analytical services enables other Government Departments to administer laws that ensure the community has pure food and water, a clean environment and a safe and law abiding society.

The Ilam Research Centre provides greatly improved laboratory accommodation to carry out these tasks.

WHEAT RESEARCH INSTITUTE

Beginnings

Wheat Research Institute was founded in 1928 with a broad mandate to carry out research and to apply science for the benefit of the wheat industry. Funding is by a levy on growers, millers and flour users with a matching Government contribution, and although the Institute is part of D.S.I.R. it also receives guidance from the Wheat Research Committee, on which all sectors of the industry are represented.



Unveiling the plaque from left to right are Mr T. Mitchell, IRC Campus Chairman, Mr E. Hullett, former director of WRI and Dr Shearer, Minister for Science and Technology

Breeding better wheats was seen from the first as a very effective way of assisting the industry. Although in 1950 the Institute's wheat breeding section was amalgamated with other groups to form D.S.I.R.'s Crop Research Division, evaluation of breeders' material for milling and baking quality remains a very important part of the Institute's work.

The Institute's work centres on utilization, and has ranged over the years from grain storage through milling and baking technology to nutrition, as the needs of the industry changed.

Testing

Testing of wheat and flour has been a constant theme, both as a guide for breeders in selecting good quality cultivars, and as a means of avoiding problems or dealing with them after they have arisen. We rely heavily on milling and baking tests which simulate industrial use, and have developed small scale dough mixing equipment to facilitate the work. Our harvest testing programme is unique. It involves milling and baking over 10,000 wheat samples, representing the entire crop, with sufficient speed to allow millers and the N.Z. Wheat Board to use the information as a purchasing guide.

Research

Testing, of course, endeavours to measure quality. Therefore it is important to understand quality, and this need underlies a number of current research projects:

- * A project to study the inheritance of quality factors (with Crop Research Division).
- * Factors responsible for the considerable variation in baking performance between wheats, even when they are the same cultivar and of similar protein content.
- * Effect of sulphur and other minor elements on wheat quality.
- * Fractionation of wheat proteins to identify quality factors (with CSIRO'S Wheat Research Unit).
- * Study of non protein nitrogen.
- * Measurement of quality variations within paddocks.
- * Causes of dark bread crumb.

Other projects are:

- * An oven temperature recorder which can be sent through a travelling oven.
- * Detection of heat damage.
- * Use of milk in bread.

Communication

The Institute is mainly concerned with the 18 flourmills and 80 or so large bread bakeries, but any wheat or flour user anywhere in New Zealand is a client, and many enquiries are dealt with on all aspects of cereal technology.

The Institute runs a Correspondence Course for bakers, and has assisted the Flour Millers Association to develop a Correspondence Course for millers.

Accommodation

This is Wheat Research Institute's fourth home. A house leased from the University in Montreal Street was the first, from 1928-1934, then from 1934-39 space was leased in the now demolished Skelton Frostick building, 193 Hereford Street.

In 1939 the Institute moved into its first "permanent" building, spacious, designed for the purpose and well equipped by the standard of the day. However by the late sixties the building had become quite inadequate, and the rehousing of the Institute became urgent.

D.S.I.R. had meanwhile decided in principle that new buildings were to be alongside an existing unit or a University campus, and had acquired land at Ilam. In late 1969 the Wheat Research Committee opted for the Ilam site rather than the Lincoln alternative and planning began for a building — the Ilam Research Centre — to house two groups: Wheat Research Institute and the Christchurch Branch of Chemistry Division.

Ilam Research Centre

A preliminary brief was drawn up on 20 March 1970 and Ministry of Works and Development commenced design work.

Sketch plans were completed in 1974 and working drawings in 1979.

Paynter and Hamilton were awarded the building contract in September 1981, and the building was substantially complete in October 1983 when occupation commenced.

The gross area of the building is 3,100 square metres, and the contract price \$3,045,645.

Wheat Research Institute's part of the Centre provides about three times the floor space available in the Hereford Street building, and houses 24 staff, with a further nine at peak periods.

Cereals are a major foodstuff, and we now have a building and facilities in keeping with the importance of the industry we serve.

BRANCH NEWS

AUCKLAND

In March the branch hosted the visit of *Les Bretherick*, a leading authority on chemical hazards. Two meetings were held in conjunction with the ACC and both were well attended. Mr Bretherick spoke about labelling and storage of chemicals, hazard assessment and information resources. He also presented greetings to the branch from the President of the Royal Society of Chemistry, along with a copy of the 3rd edition of "Hazards in the Chemical Laboratory". His lectures also included handouts of an extensive list of references on aspects of chemical safety, copies of which may be obtained from the Editor.

The branch committee in an uncharacteristic bout of enthusiasm has recently conducted a telephone survey of about 25% of members, regarding future branch activities. It appears the dominant response has been one of surprise! Who knows where this will lead to — an increase in the 5% attendance at meetings perhaps?

Oil and Fats Meeting — Evening Primrose Oil

An enjoyable and well-attended (47 registrants) meeting of the group was held on Wednesday 28th March in Old Government House at the University of Auckland.

Diana Fenton, Abels' research chemist gave a short history of the technical background to Evening Primrose Oil along with details of analytical methods for gamma-linolenic acid and tests for Evening Primrose Oil authenticity.

Professor John Scott of the Auckland Medical School gave a well-balanced talk concerning the medical fraternity's view of this type of "natural" panacea.

Copies of both papers appear in this issue.

WAIKATO

The Waikato branch has entered the educational arena by launching an Analytical Chemistry Competition for senior school students, based on experience gained by the Wellington branch in a similar endeavour. A total of 75 High Schools throughout the region have been approached and it is hoped that prizes will be awarded at the annual Science Fair in July.

In a further effort to interest senior students in the activities of the Branch, schools in the Hamilton area are now receiving notices of monthly meetings in a more interesting format. At this stage it is too early to judge the results of this approach, although attendance at monthly meetings is apparently higher than at the same time last year.

MANAWATU

Mr Eric J. Dodd, Senior Technologist with the N.Z. Refining Co, addressed the first Branch meeting for 1984 (27 January) on "The Whangarei Oil Refinery Expansion Project". Mr Dodd discussed the program of expansion in production of petroleum fuels at Marsden Point since the early 1960s. He described the installation and use of the various units that make up the new facilities as well as aspects of the refining processes. An indication of the total cost of the project is provided by the million dollar price tag for a model of the new processing facilities. This two and a half hour presentation (plus time for questions) was most interesting and timely because of numerous

statements on the project being reported in the news media.

Following on in our industrial theme for the beginning of the year, on 19 March *Mr Les Bretherick*, Research Project Leader with the B.P. Research Centre in England (retired 1982), addressed a meeting on the subject "Chemical Reaction Hazards: Causes and Prevention". Topics covered in this address included the prediction of the stability of various types of chemicals and aspects of the release of energy during the progress of chemical reactions. Methods that are available for stability assessments, that were discussed by Mr Bretherick, included experimental measurements (from carefully heating the component(s) in a test-tube to more sensitive — and much more expensive — calorimetric methods) and calculations of the stability of compounds using computer programs involving bond energies. The consideration of factors, such as temperature and pressure control, agitation and the physical properties of the reacting components, in process plant design must be considered at the earliest possible stage in the development of equipment to eliminate the possibility of inherent faults or potential hazards being built into systems. This address was of interest to scientists and engineers in establishments of small chemical laboratories to large-scale industries, as well as management and union representatives. Dr Bretherick's visit to New Zealand was sponsored by the N.Z.I.C. and the Accident Compensation Corporation.

On 11 April *Dr Peter Sykes*, Fellow of Christ's College, Cambridge, England, addressed a meeting on the subject of "Pathways Through the Organic Jungle". Dr Sykes described a number of reactions that have yielded "unusual" products and then he discussed possible pathways to these products from the initial ingredients. In most organic reactions the yield of a desired product is usually less than 50% and the identification of all of the "impurities" (as well as pathways for their production) is an extremely difficult exercise to undertake. Dr Sykes described the use of both radioactive and non-active isotopes in studies of some chemical pathways, though problems can arise in deciding where the label(s) is present in the products. Methods that may be used for locating these labels, that were discussed, included radioactive counting (together with chemical degradation), mass spectrometry, various aspects of nuclear magnetic resonance spectrometry and other related techniques. During his address Dr Sykes mentioned many "unsolved" reaction pathways to be considered by the audience.

At the opening of a meeting on 2 May, *Mr R.H. Arbuckle*, Executive Director of I.C.I. (N.Z.) Ltd, Wellington, presented the Institute's I.C.I. Prize for 1983 to *Dr E.N. (Ted) Baker* of the Department of Chemistry, Biochemistry and Biophysics at Massey University. This prize was awarded to Dr Baker in recognition of his research into the structure and function of proteins, in particular actinidin. *Professor R.D. (Dick) Batt* of the same Department then presented the Branch's 300-level prizes to *Mr M.L. Brader* (from Wanganui) and *Mr D.R. Englebretson* (Stratford) for chemistry (a joint presentation) and *Mr C.S. Gibbs* (Marton) for biochemistry. Professor Batt then gave the

Branch's Presidential Address on the subject "Alcohol and Politics". He briefly described some of the research carried out in his department since 1968 on the metabolism of alcohol. The effect of the Country's economic activity on alcohol consumption (per-capita) from the 1850s (obtained from statistics held by the Massey library) to the present day was then considered. People's attitude to alcoholic liquor, changes in people's lifestyles and changes in the law and its application can pose difficulties in the collection of accurate statistics. Professor Batt proposed that more research is required into the effect of people's drinking habits on the resulting levels of alcohol in their blood. Studies on the time that food is retained in the stomach could be a very important part of this research. Dissemination of information to the public on possible positive values of alcohol in the diet is made difficult by the action of vocal pressure groups representing alcoholics and their organisations, which are a small proportion of the total population. This presentation, into the realm of social science, was a welcome change to those of a purely chemical nature and indicated problems that we may face when we move from "pure" chemistry to matters of conscience and community responsibility.

The Branch will again be producing booklets containing answers to multiple-choice questions from University Entrance and Scholarship Examination papers. These most popular publications for secondary school students, this time covering the years 1971 to 1983, will be available in July. A circular will be sent to school science departments soon and further information about the booklets can be obtained from Dr J. Lee, Applied Biochemistry Division, D.S.I.R., Private Bag, Palmerston North.

CANTERBURY

The speaker at the March meeting of the Canterbury branch was *Dr Ian Miller* (Chemistry Division DSIR Lower Hutt) who spoke about the possibility of producing polyimide plastics from the durene which is likely to be a significant by-product in the production of synthetic gasoline from methanol at Motonui. He discussed the particular difficulties which a small country like New Zealand would encounter in tackling such a venture. Before the meeting the Branch put on a barbeque to which student members were especially invited.

Mr Leslie Bretherick an expert on safety in the chemical industry also visited Christchurch in March. He gave an address on chemical reaction hazards to interested branch members and staff of the Chemistry Department, University of Canterbury.

In April, *Dr Peter Sykes* (University Chemical Laboratory Cambridge) spoke on "Pathways Through the Organic Jungle". Dr Sykes has authored a number of texts on organic reaction mechanisms and his talk centred on such aspects of investigation as detection of intermediates, isotopic labelling, and kinetic isotope effects.

The May meeting took the form of a dinner to which graduates in chemistry from Christchurch Polytechnic and the University of Canterbury were especially invited. After a very pleasant meal and a welcome to graduates by Branch Chairman *Dr Kip Powell*, *Dr John Hayward* spoke on the topic "Science and Policy". Dr Hayward is Director of Resource Management, University of Canterbury and Chairman of the N.Z. Environmental Council. In a stimulating talk he stressed that scientists should take an interest in policy but suggested

UNIVERSITY NEWS

Auckland

Dr Warren Roper has been awarded the 1983 Royal Society of Chemistry Award for Organometallic Chemistry. The RSC selects each year about ten fields of research, and invites nominations for an RSC Award in each. Only very rarely is an Award made other than to a British chemist.

As we go to press it has been announced that *Dr Roper* has also been made a Fellow of the Royal Society of New Zealand.

The work of *Dr Roper's* group will be featured in a forthcoming issue of this journal.



Dr W. Roper

Waikato

The Chemistry Department has welcomed an unusually large number of overseas visitors recently, including two from Cambridge in the same week.

Dr Peter Sykes gave a variation of his NZIC lecture on "Pathways Through The Organic Jungle", to a largely undergraduate audience. *Dr Malcolm Gerloch* talked on "Recent Advances in Ligand Field Theory". We also welcomed *Professor Rod Rickards* from ANU, together with a group of Auckland apothecaries, and he addressed a special seminar entitled, "Interactions of Organic Chemistry with Biology".

Early in May *Dr Colin Jones* from the University of Leicester, will be presenting a seminar on "Bacterial Energy Conservation".

Dr Malcolm Carr is presenting a paper at the fifteenth annual conference of the Australian Science Education Research Association at Monash University in May.

Massey

Mr Dean Stockwell has been appointed the first full-time director of the Food Technology Research Centre. The present director, *Dr Mary Earle*, is resuming her teaching duties with the Department of Food Technology on a full-time basis. The Centre is an independent unit within the University which handles requests from the N.Z. food industry for research and development, problem solving and information services. Over 40 food processing companies are members of the Centre. The aim of the Centre is to increase the processing of biological raw materials in food products, particularly for export markets. In the past few years this has involved the development of products ranging from frozen mussels to chilled coleslaw, trimmed pork to diet foods, and aerosol dairy cream to candied kiwifruit. *Mr Stockwell* is a graduate of the Faculty of Technology at Massey University with a B.Tech.(Hons) in Food Technology and a Master of Technology (Hons) in Industrial

Management and Engineering. He has been employed in the New Zealand Co-operative Dairy Company, Hamilton, a major manufacturer of dairy products for the local and export markets. During his early years with the Company he was involved in factory production, but for the last eight years he has been in quality assurance, product technology and product development.

The University recently created a new Chair of Food Engineering in the Department of Food Technology. *Dr Peter Munro*, presently a senior lecturer in the Department of Chemical and Materials Engineering at Auckland University, has been appointed to this Chair. He has a B.E. (1st class Hons) from Auckland University and a PhD from University College, London. In 1979 he was appointed as an honorary staff member of the N.Z. Dairy Research Institute and in 1983 he received the Riddet Award of the N.Z. Society of Dairy Science and Technology. His research speciality is biochemical engineering with particular emphasis on the formation and mechanical properties of protein precipitates. Most of *Dr Munro's* research has been directed at applications in the dairy and meat industries.

The Department of Food Technology has published a Proceedings from its Symposium on Food Chemistry, held on 14 and 15 November, 1983. The Proceedings, entitled "Developments in Food Analysis", is available (cost \$15) from *Professor E.L. Richards* of the Department. Some of the techniques that are described include infra-red analyses, high pressure liquid chromatography, gas chromatography — mass spectrometry and atomic absorption spectroscopy. These techniques are applied to a wide range of food topics such as analyses of fats and oils, flavour evaluations of fruit and their extracts, trace elements in fish products and the main components of milk. This is a good publication for those interested in recent developments in the analysis of foods, and in related products not intended for feed purposes.

The University recently purchased a Foss Model 104 Milko-scan from grants provided by The N.Z. Dairy Board and the University Grants Committee. This equipment will be used in milk composition determination studies being carried out by *Professor D.S. Flux* (Department of Animal Science) and other staff for their work on high and low "breeding index" cows where differences in the milk produced by these genetically different groups have yet to be fully understood. Other types of milk to be analysed in the Milko-scan include ewe's milk, for a study on lamb growth, and human milk, which has been studied by biochemists for a number of years.

Dr W.S. (Bill) Hancock, a Reader in the Department of Chemistry, Biochemistry and Biophysics, has been awarded the Walter Burfitt Prize and Medal by the Royal Society of New South Wales, Australia. The award has been made for his outstanding research in the field of lipoprotein chemistry and biochemistry. *Dr Hancock* is the 19th recipient of this prize which is awarded at three yearly intervals to the researcher in pure or applied science, resident in Australia or New Zealand, whose publications during the previous six years are deemed to be of the highest scientific merit.

In recent years *Dr Hancock* has led a research team investigating lipoproteins — molecules of fat joined to proteins which facilitate fat transport in the blood stream. It is generally accepted that there are two medically important forms of lipoprotein, namely high density lipoprotein and low density lipoprotein, and that their ratio in the blood stream is a determining

factor in heart disease. *Dr Hancock's* research program has involved chemically synthesising fragments of lipoprotein, to allow assessment to be made of the role of the various parts of the lipoprotein in heart disease. He has also developed a new technique based on high performance liquid chromatography which enables measurements to be made of the lipoprotein levels in a patient's blood. In addition, he has carried out fundamental studies on how proteins and fats interact.



Dr W.S. Hancock

Dr Hancock has received extensive funding from the University Grants Committee, Medical Research Council and the National Heart Foundation for his work. Recently he received a grant from the N.H.F. to support an investigation into the oxidation of ethanol to acetaldehyde and the reactions of these chemicals with lipoproteins. Acetaldehyde is also one of the major products in cigarette smoke.

Dr David Fountain (Department of Botany and Zoology) has received a grant from the Wildlife Service, Department of Internal Affairs, for his research into the analysis of Kiwi proteins as an aid to species recognition. In previous work, small volumes of whole Kiwi blood have been collected by Wildlife Officers around New Zealand over the past two years and sent to Massey. Preservation of the blood was by saturated ammonium sulphate containing 2-mercapto-ethanol to stabilise cells and soluble proteins. Following dialysis and lyophilisation, samples were analysed by isoelectric focusing. A study of North Island Kiwi (*Apteryx australis mantelli*) samples showed three taxonomically distinct forms; in Northland, Taranaki and the Ureweras. This study is to continue with examinations of feather keratins.

Professor J. Keith Syers (Department of Soil Science) has been awarded a two year contract by the Ministry of Agriculture and Fisheries for research into the development and evaluation of new and improved fertilizers, particularly those products based on phosphate rock. Last year *Professor Syers* received Special Leave from the University to accept an invitation from Academia Sinica (The Chinese Academy of Sciences) to visit China. *Professor Syers* presented a series of (three hour plus discussion time) lectures in the area of soil and fertilizer phosphate chemistry at the Institute of Soil Science, Nanjing. He also discussed aspects of current research projects being undertaken by members of the Phosphate Group at the Institute. An outline of a co-operative research program in soil phosphate chemistry was developed. *Professor Syers* also visited the Nanjing Agricultural College, the Jhejiang Agricultural University in Hangzhou,

UNIVERSITY NEWS CONT.

the Shanghai Academy of Agricultural Science, and the Jiangsu Academy of Agricultural Science. In his report to the University Council, Professor Syers said, "Chinese agricultural scientists are keen to learn more of Western technology and are highly appreciative of efforts to assist in this direction".

Dr George Smillie, a visiting lecturer from University College, Dublin, is currently spending a year working with soil scientists at Massey. One of the aims of his visit is to discover more about the effects of lime on phosphorus availability. *Dr Smillie* also intends to find out how phosphate rocks perform as a fertilizer.

Victoria

Recent visitors to the Chemistry Department have included: *Prof R. Richards* (Australian National University) who presented a seminar "Interactions of Organic Chemistry with Biology" and *Dr Peter Sykes* (Cambridge University) who discussed "The Action of Nucleophiles on Azolium Systems". *Dr Sykes* also presented an undergraduate lecture on "Pathways Through the Organic Jungle".

Dr Regine Blattner has taken up the position of Junior Lecturer in the Chemistry Department. *Dr Bill Jordan* has returned to the Biochemistry Department from seven months leave spent at the Walter and Eliza Hall Institute of Medical Research, Melbourne Royal Hospital.

Dr D.V. Park (University of Surrey) recently spent a short time in the Biochemistry Department and gave a seminar on "The Reduction of Carcinogens by Oxidative Systems". *Professor R. Rodnight* (Institute of Psychiatry, University of London) has also been a visitor and presented his work on "Biochemical Aspects of the Biology of Schizophrenia".

Canterbury

Professor Michael Hartshorn and *Dr Jack Fergusson* are both overseas travelling on Erskine Fellowships. *Professor Hartshorn* is visiting the United States and the United Kingdom and *Dr Fergusson* is at Dalhousie University Nova Scotia.

Dr Robert MacLagan has left for 12 months study leave to be spent at Berkeley University California working with *Dr H.F. Schaefer*. *Dr Graeme Wright* is spending 12 months study leave with DSIR (Chemistry Division) at the Ilam Research Centre. While there he is looking at the organic compounds (particularly those with mutagenic properties) associated with Christchurch air particulates.

Otago

Professor Rod Richards, Professorial Fellow at the Australian National University in Canberra, visited the Chemistry Department in April. His lecture entitled, "Interactions of Organic Chemistry with Biology", was concerned with processes of life at a molecular level.

Also, from the Chemistry Department, three people plan to visit Australia in May. *Professor Arthur Campbell* will lecture at the University of Tasmania, before moving on to Melbourne where he plans to visit a coal research laboratory and the Amdel Microanalytical Laboratories. He also plans to visit the Herman Research Laboratory of the State Electricity Commission of Victoria, and microanalytical laboratories in Canberra. Finally, he will attend the A.N.Z.A.A.S. conference at the Australian National University. *Associate Professor D.J. Brasch* will attend the Annual Conference of the Australasian Pulp and Paper Technical Association in Brisbane. He also plans to visit the Brisbane N.M.R. Centre at Griffith

University. *Dr Keith Hunter* will present a lecture course on the analytical chemistry of trace elements and their marine geochemistry at Deakin University, Geelong. He will also take part there in a symposium on trace metals in water and visit the School of Chemistry at the University of Melbourne. *Associate Professor D.V. Fenby* will spend four months leave in Europe and the U.S.A. He plans to visit the Centre Nationale de Recherche Scientifique in Paris, the Royal Institution in London and the University of Pennsylvania in Philadelphia.

From the Pharmacology Department, *Associate Professor I. Ralph Edwards* and *Dr Wayne A. Temple*, who are Director and Scientific Director respectively of the National Poisons Information Centre, have both been elected to membership of the American Academy of Clinical Toxicology. The Poisons Centre has also become a corporate member of the American Association of Poisons Control Centres. *Prof. Edwards* is to visit the U.S.A. for preliminary hearings of the Vietnam Veteran's Agent Orange Enquiries. *Rex Malthus*, research officer in the Department of Clinical Biochemistry, has recently retired.

From the Nutrition Department, *Dr Laurie Melton* attended the Annual Congress of the Australian Institute of Food Science and Technology in Sydney. He presented a paper entitled, "Texture Changes during Controlled Atmosphere Storage of Apricots". While in Sydney, he also visited the C.S.I.R.O. at North Ryde and the Departments of Chemistry and of Food Technology at the University of New South Wales.

The Biochemistry Department has had two visitors. *Dr George Yeoh*, from the University of Western Australia's Department of Physiology, lectured on his system for growing foetal liver cells on collagen supports in culture in order to study enzymic changes which occur during development. The highlight of *Dr Yeoh's* week comes on Monday when he isolates 200 foetal rat livers. *Dr Don Kupke*, from the University of

Virginia in Charlottesville, is spending two terms as visiting lecturer. His interest is in studying entropy changes in order to see how macromolecules such as calmodulin function in important biochemical reactions.

BRANCH NEWS CONT.

that politics be left to the politicians.

(This meeting attracted the attention of a usually uninterested local media — radio and newspaper comment was made on the special invitation made in the branch newsletter to "spouse-equivalents".)

OTAGO

The programme for the year started with a visit to the M.A.F.'s Invermay Agricultural Research Centre at Mosgiel. Diagnostic, Soil Testing and Animal Health laboratories were visited. A large group of members attended, large enough to cause considerable congestion within the limited confines of the Ministry's laboratories, although many recovered afterwards by dining at the Mosgiel Tavern.

Towards the end of March, *Mr Les Bretherick* visited Otago. *Mr Bretherick* is known for his book entitled, "Handbook of Reactive Chemical Hazards", and co-authorship of the Royal Society of Chemistry publication, "Hazards in the Chemical Laboratory". He addressed the Branch on the topic, "Chemical Reaction Hazards: Causes and Prevention".

In mid-April, *Dr Peter Sykes*, from Cambridge University in England, visited Otago during an N.Z.I.C./R.S.C. sponsored lecture tour of this country. *Dr Sykes* is known particularly for his two textbooks on Organic Chemistry and his series of cassettes on reaction mechanisms for the Royal Society of Chemistry. Branch members, then next day, students of the University Chemistry Department, heard him deliver a captivating lecture on the topic, "Pathways through the Organic Jungle."

John Billcliff, from Otago Boys' High School, reports that the Otago Science Teachers are running a competition for 4th-form science students after Easter. Also, he represented the region at the 6th-form Chemistry Teachers' Guide Conference held at the Police College in Wellington in April.

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GOVERNMENT DEPTS AND RESEARCH INSTITUTIONS



DSIR — AIDD

Mr L.H. Boulton, a metallurgical analyst in the Engineering Materials Group, has been awarded the NZ Forest Products Selwyn J. Robinson Scholarship for 1984. He will travel to North America to attend the 9th International Congress on Metallic Corrosion in Toronto, followed by short visits to the Fontana Corrosion Centre at Ohio State University, Columbus Battelle Laboratories, and the Institute of Paper Chemistry at Appleton, Wisconsin. His trip concludes with a six week study visit at the Pulp and Paper Research Institute of Canada (PAPRICAN) at Pt Claire. The purpose of these visits will be to study industrial corrosion monitoring techniques applicable to the pulp and paper industry and to investigate the corrosion of stainless steel in closed white water systems in paper mills.

overseas study award in Hanover, West Germany. This will be a collaborative study with *Professor W. Engelhardt*, and was offered under an O.E.C.D. program on plant particle breakdown and utilisation in sheep fed low quality roughage diets.

Miss Barbara McCallion of A.B.D.'s Lincoln substation has been appointed Assistant Information Officer at Massey University.

Dr Ian L.S. Scott, a cyto-geneticist who did his PhD at Massey University, will be at A.B.D. for a year working with *Dr Tom Broad* on aspects of lipid biochemistry.

New Developments for Industry were discussed recently at a one-day seminar organised by the Biochemical Processing Centre of the D.S.I.R. Eighty people, including representatives of a wide variety of industries, Medical Schools, M.A.F., D.S.I.R. and the Universities attended the seminar, which was opened by the Minister of Science, *Dr Ian Shearer*. The guest speaker was *Dr C.S. Barnes* of Biotechnology Australia Pty Ltd. Topics discussed included pharmaceutical research and production, production of food grade lactose from whey, applications of Massey University's ion exchange resins, high-rate anaerobic waste water treatment, developments in animal cell culture and molecular genetics, as well as international perspectives and industry responsibility for supporting innovation.

Applied Biochemistry Division recently took over a new building for its Feed Evaluation Unit. The building has six animal rooms which can be controlled for temperature, humidity and light periods. It operates under positive air pressure with the animal rooms at a higher pressure than the service areas. There is a permanent staff of two who are responsible for the daily maintenance of both animals and the building. Scientists using the Unit are expected to supply any labour necessary to run their own experiments.

DSIR — Wellington

Chemistry Division:

Dr L.P. Aldridge is on leave from Chemistry Division for 9 months working with Professor A. Trantwein at the Institut für Physik, Medizinische Hochschule, Lubeck. He will be studying the Mossbauer and optical spectra of iron in minerals, zeolites and compounds of biological interest.

Dan Perera, *Mike Rose* and *Vaughn White* from the now defunct Pottery and Ceramics Research Association have joined the Solid State Section and will continue their involvement in ceramics testing and research.

Soil Bureau:

Mr Norman Wells has taken over as Deputy Director on the retirement of *Dr Roy Northey*. *Dr Cyril Childs* has become the Section Leader of the Chemistry and Mineralogy Section taking over from Mr Wells. Dr Childs is attending the Australian Soil Science Society Conference being held at Brisbane in May 1984 where he will be giving a paper on the Mossbauer spectra of samples of Queensland oxisols.

Health Dept — Christchurch

Dr Murray Matthews is now Head of the Environmental Radioactivity and Chemistry Section of the National Radiation Laboratory, following the retirement of *Mr Lloyd Gregory*. *Michael Gray* has joined the section to work on environmental analytical chemistry, particularly the determination of industrial solvent vapour levels.

MAF — Dunedin

Dr Rex Dolby, Scientist in charge of the Analytical Servicing Laboratories at the Invermay Agricultural Research Centre, is attending a six-week course on soil and plant analysis at the University of Reading in England. Also at Invermay, *Mr Tim Manley*, Technical Officer in the Animal Nutrition Section, has been awarded a Rotary Foundation Scholarship. This will enable him to spend a year at the M.R.C. Radio-immunology Department in Edinburgh, Scotland, where he will learn about immuno-chemical methodology. Finally, *Dr David Forss*, Scientist in the Animal Nutrition Section, will retire in June. Dr Forss has been involved with chemical and biochemical aspects of animal nutrition, and recently has been investigating palatability of and the effects of electrical stimulation on venison from farmed and wild deer. He will continue to consult with a food company on sensory aspects of food quality, and will advise venison producers on optimising palatability.



DSIR — Palmerston North

Dr Graeme Russell, Group Leader of the Organic Chemistry Section of A.B.D., is on a year's sabbatical leave in the Department of Chemistry at the University of Southampton, England. While in England, Dr Russell will be furthering his studies on the resistance of some plants to insect pests. This will involve studies of the root chemistry of sainfoin and the chemistry and biology of the Mediterranean fruit fly, in collaboration with *Professor Ray Baker* of the Department. *Dr John Shaw* is Acting Group Leader during Dr Russell's absence.

Dr Dave Dellow has started a seven month

The Unit currently houses a colony of random bred Sprague-Dawley rats which are used almost exclusively for feed evaluation work, inbred colonies of BALB/C, C57 and CAB mice which are used for both antibody production and for embryo transfer work, and N.Z. white rabbits, which are used for antibody production. The rabbits are not bred in the Unit as the staff have found that it is more economical to purchase them from an accredited breeder as the demand arises. In the future the staff expect to increase both the types and strains of the animal stock that they will hold.

INDUSTRIAL PEOPLE

Dr R.W. Renfrew, Mobil Oil NZ Ltd, is in Europe to attend a two week laboratory training course at Wedel, West Germany and will be visiting Mobil Oil blending plants in France and England.

Joe Bognar of New Zealand Forest Products has been selected as industry representative on the Clean Air Council, a statutory body reporting to the Minister of Health. Joe is involved in NZFP's environmental activities, and has also recently joined the Auckland Branch committee.

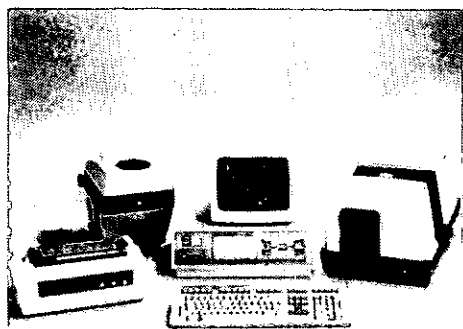
NEW PRODUCTS

NEW SHIMADZU UV-VIS

The latest addition to the Shimadzu range of UV-VIS recording spectrophotometer UV-260 is a microcomputer controlled, reporting, scanning, double-beam spectrophotometer with built-in CRT display and graphic printer/plotter.

Using a high performance, ion-etched blazed holographic grating, a sealed monochromator casing and a unique light source positioning mechanism the UV-260 ensures extremely low stray light and high resolution. Slit width selection of 10 positions.

The 150mm wide sample compartment, which opens on three sides, enables operators to change samples and mount or dismount accessories with ease.



The UV-260 incorporates a 12" CRT which displays all the operational parameters, wavelength and photometric values, date and time, printer on or off, analog or spectrum display. The memo area is a large enough to allow two lines of 64 characters. The timer operates continuously even while power is off.

The CRT can be used alone, or in conjunction with the printer/plotter to provide a hard copy in a format suitable for final filing. The entire CRT image can be copied simply by one key entry.

The printer/plotter as well as providing a hard copy of the CRT image will automatically format parameters and draw up the chart frame. The choice of different line formats is particularly useful for overlay and time scans. If simple absorbance readings are required, the UV-260 will print out data with sample number and result.

High level data processing functions provide a wide variety of qualitative and quantitative techniques. The one channel memory enables spectra to be stored so that arithmetic calculations between a stored spectrum and a real time spectrum can be made. The UV-260 provides 1st-4th derivative spectra with a peak pick and peak area calculation. The time course change of absorbance and its rate can be recorded. Different methods of calculation include fixed wavelength method, three wavelength method and area calculation method.

The unique command-chain mode allows automatic operation of various functions of the instrument with one key entry. This function-linking is simple to perform and does not require the knowledge of any programming languages.

The UV-260 is a sophisticated and versatile spectrophotometer which can be used with a wide range of accessories and can also be interfaced to an external computer to further enhance its features.

Sole local agents SCI-MED (NZ) Ltd for further information, circle 12 on the reader reply card.

Australian Corrosion Assn — Conference 24: Corrosion Technology: 1984 and Beyond.

19-23 November, 1984. Symposia on Corrosion in Geothermal Systems and Corrosion in the Pulp and Paper Industry are included in the programme. Contact: P.O. Box 5961, Auckland.

NZ Hydrological Society, 1984 Symposium.

26-30 November, Hamilton. The main theme of the symposium will be groundwater hydrology. Contact Mr A. Dons, Water Quality Centre, MOWD, Privage Bag, Hamilton.

9th International Congress of Agricultural Medicine and Rural Health.

10-14 September 1984. Includes a day on agricultural chemicals — health and toxicity. Contact convention Management Services, P.O. Box 3030, Wellington.

OVERTASMAN

Polymer 85 — An International Symposium on Characterisation and Analysis of Polymers.

11-14 February, 1985, Melbourne. IUPAC sponsored. Contact Polymer 85, Ryal Australian Chemical Institute, 191 Royal Parade, Parkville, Vic. 3052, Australia.

OVERSEAS

For further information on the following conferences contact the Editor.

30 the IUPAC congress, September 1985, Manchester.

IAWPRC: 12th Biennial International Conference on Water Pollution control, and Aquatech '84, September 1984, Amsterdam.

Analytical Chemistry in the Exploration, Mining and Processing of Materials (IUPAC), April 1985, Pretoria.

Achema 85 (chemical engineering), June 1985, Frankfurt.

International Symposium on Organometallic Chemistry Directed Toward Organic Synthesis, (IUPAC), July 1985, Kyoto.

International Symposium on Novel Aromatic Compounds (IUPAC), July 1985, St Andrews.

International Symposium on Mycotoxins and Phycotoxins (IUPAC), July 1985, Pretoria.

International Symposium on Macromolecules (IUPAC), August 1985, The Hague.

International Conference of Thermal Analysis, (IUPAC), August 1985, Bratislava.

International Congress of Pesticide Chemistry (IUPAC), August 1986, Ottawa.

GC COLUMNS

Alltech Associates N.Z., following their recent move to new premises at 46 Elllice Road, Glenfield, announce that ALLTECH GC Column Packings, as well as both empty and packed glass and stainless steel GC columns, will be available from them on a 'custom' made basis. Alltech's new premises have full facilities for the packing and repacking of Chromatography consumables — a service which brings the New Zealand branch of Alltech/Applied Science into line with other Alltech locations throughout the world.

For further information circle 13 on the reader reply card.

NORTHROP COMPUTER DIVISION

The formation of a new division within Northrop Instruments & Systems Limited was announced recently.

The Northrop Computer Solutions Division will concentrate on expanding Northrop's share of the vertical software market for microcomputers and microcomputer software, particularly in the Engineering/Survey/Medical/Scientific applications. Northrop will offer a range of hardware and software packages based on the IBM PC, HP 150, and Epson QX10.

Representing as much as 30 percent of the new market for microcomputers and microcomputer software, General Manager of Northrop, Murray C. Cole, predicts that the vertical software market will increase at a compound annual rate of 25 percent for the next five years.

Northrop Computer Solutions will offer dedicated software application packages together with turnkey hardware and software systems.

For further information contact Northrop Instruments and Systems Ltd or circle 14 on the reader reply card.

GAF FILTER SYSTEMS: FIRST CHOICE FOR LIQUIDS!

WE HAVE THE EXPERIENCE —

- Adhesives
- Agricultural Chemicals
- Industrial Detergents
- Paints, Lacquers
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- Process Water
- Resin, Polymer solutions
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Telex: NZ 60332

SOUTH ISLAND DISTRIBUTORS: DON HALL MACHINERY LTD

Dunedin Ph 30689 Christchurch Ph 797-129
For further information circle 9 on Reader Reply Card. G.T.P.4

NEW PRODUCTS

ALPHATECH/WATERS H.P.L.C. SEMINARS

Alphatech Systems will be holding a series of Seminars during June and July.

The first will be in Auckland only and will introduce two major new products from Waters Associates for Advanced Data Acquisition and Control, and Advanced multichannel detection.

This will be held on Wednesday June 20th, 1984 from 12.30-5.00pm.

The second series of seminars will detail advances in Ion Chromatography and other techniques in HPLC, and introduce a new Ion Chromatography from Waters.

Speaking at these seminars will be Dr Paul Haddad from University New South Wales Department of Analytical Chemistry who is currently working in this rapidly growing area.

These will be held as follows:—

Auckland — Monday July 9th 1984
9.30-4.00pm

Wellington — Thursday July 12th 1984
9.30-4.00pm

Christchurch — Friday July 13th 1984
9.30-4.00pm

For information and registration at these seminars please contact Bob Foulkes of Alphatech Systems. Phone:— 770-392 P.O. Box 5565, AUCKLAND.

HPLC COLUMN PACKING

Machery-Nagel, of West Germany, have just appointed Alltech Associates N.Z. their distributor, in New Zealand, for their extensive range of GC, HPLC and TLC products.

Machery-Nagel and Alltech/Applied Science have been closely associated for several years in Europe, and this latest move is an extension of that relationship.

Alltech announce the availability of a new Machery-Nagel HPLC Column Packing — NUCLEOGEN. This is a new tool for HPLC users in the fields of molecular biology and gene technology. NUCLEOGEN enables the separation of oligonucleotides, tRNA, 5S RNA, viroids, messenger RNA, DNA restriction fragments, and plasmids. Further details are available by circling 15 on the reader reply card.

SPECTROCOLORIMETER TIES IN WITH PERSONAL COMPUTER

The LabScan II spectrophotometer, introduced by HunterLab, allows combining either the 0°/45° or sphere optical sensor with a DEC Rainbow personal computer. Software features permit users to define and retain formats for the CRT display and the external printer via the standard RS232 communications port. Simultaneous display and plotting of colorimetric data in any two illuminants gives simple and direct indication of metamerism. Other features include smooth spectral curve plotting, calculation of averages and standard deviations, unlimited data storage and keyboard entry of spectral or colorimetric data.

Availability of a UV enhanced source lamp that closely matches a true D₆₅ illuminant down to 300nm permits measurement of fluorescent-whitened materials. The availability of color formulation and color matching software allows the creation of a desired color, while optimizing variables such as pigment type, amount used, level of metamerism and cost of materials and permits correcting and existing batch of color to meet requirements.

Local agents Advanced Electronics Ltd. for further information circle 16 on the reader reply card.

NEW ELECTRONIC ANALYTICAL BALANCE FROM METTLER

With the new AE166, Mettler introduces an electronic analytical balance with a feature borrowed from its proven precision balances: famous **DeltaRange**.

The AE166 has a maximum capacity of 162g, readable to 1mg. Mettler **DeltaRange** is a fine range of 60g, readable to 0.1mg. When weighing-in, the display automatically switches over to the readability of the normal range when this fine range is exceeded. Formula weighing is now made especially easy because **DeltaRange** can be recalled by pressing the control bar after weighing-in each component. This allows the next component to be weighed in from zero with a readability of 0.1mg, again up to 60g.



Operation of the AE166 is also easy because of Mettler's proven single control bar feature. It takes just a press to set the display to zero or to take out a container weight. The single control bar is also used to adapt the balance to varying ambient conditions (stability detector, integration time). The AE166 can be equipped for connection to an in-house data communication system at any time.

The AE166 **DeltaRange** can be used in any lab where formulas are frequently weighed out. It is particularly useful when small amounts must be weighed very precisely into relatively heavy containers.

Last but not least, the user in the small lab can finally purchase a modern analytical balance with state-of-the-art electronics at an attractive price.

NZ agents, Watson Victor Ltd, for further information circle 17 on the reader reply card.

NALGENE LITERATURE

Two Nalgene plastic labware information sources are available free of charge from Watson Victor Ltd. To obtain a copy of the 20pp booklet "Nalgene Centrifuge Ware Selection and Rotor Matching Guide" circle on the reader reply card. A wall chart showing the physical properties and chemical resistance of Nalgene labware is available by circling

HPLC-SYSTEM FOR FATS AND CARBOHYDRATES

The new Optilab 5931 Liquid Chromatograph from Tecator is intended for research and routine analysis of fats and carbohydrates.

The instrument combines a patented interference refractometer and a refined HPLC unit in a single system.

Sensitivity is 10 to 100 times greater than that of traditional RI-monitors. The detection limit is as low as 10 nanograms. An absolute calibration feature eliminates the need for standard calibration.

The Optilab 5931 Liquid Chromatograph also includes a unique system for control of temperature and flow, which ensures extremely high stability and allows for reproduction of chromatographic conditions.

A complete analysis with the Optilab 5931 takes only 20 minutes. Extreme sensitivity and operation with small samples generate 10 to 100 times longer column life, reduced costs for chemicals and simplified sample preparation. The overall result is a very low cost per sample analysis. For further information contact Wiltons or circle 18 on the reader reply card.

LABORATORY SEALING FILM

Recently introduced to the New Zealand market is an elastic laboratory film called 'Whatman Laboratory Sealing Film'. It moulds and seals itself around culture tubes, flasks, broth tubes, petri dishes and many other instruments and objects, even with irregular surfaces.

Whatman Laboratory Sealing Film is:—

- Heat resistant up to 60 °C
- Flexible
- Moldable
- Moisture Proof
- Self Sealing
- Odourless
- Semi transparent
- Thermoplastic

Its high tensile strength (elongation tests showed higher tensile strength against a competitive brand) coupled with its high chemical resistance against common laboratory chemicals such as Sodium Hydroxide, Hydrochloric Acid, Sulphuric Acid, Chloroform and Carbon Tetrachloride, make it ideal for many important laboratory uses and techniques.

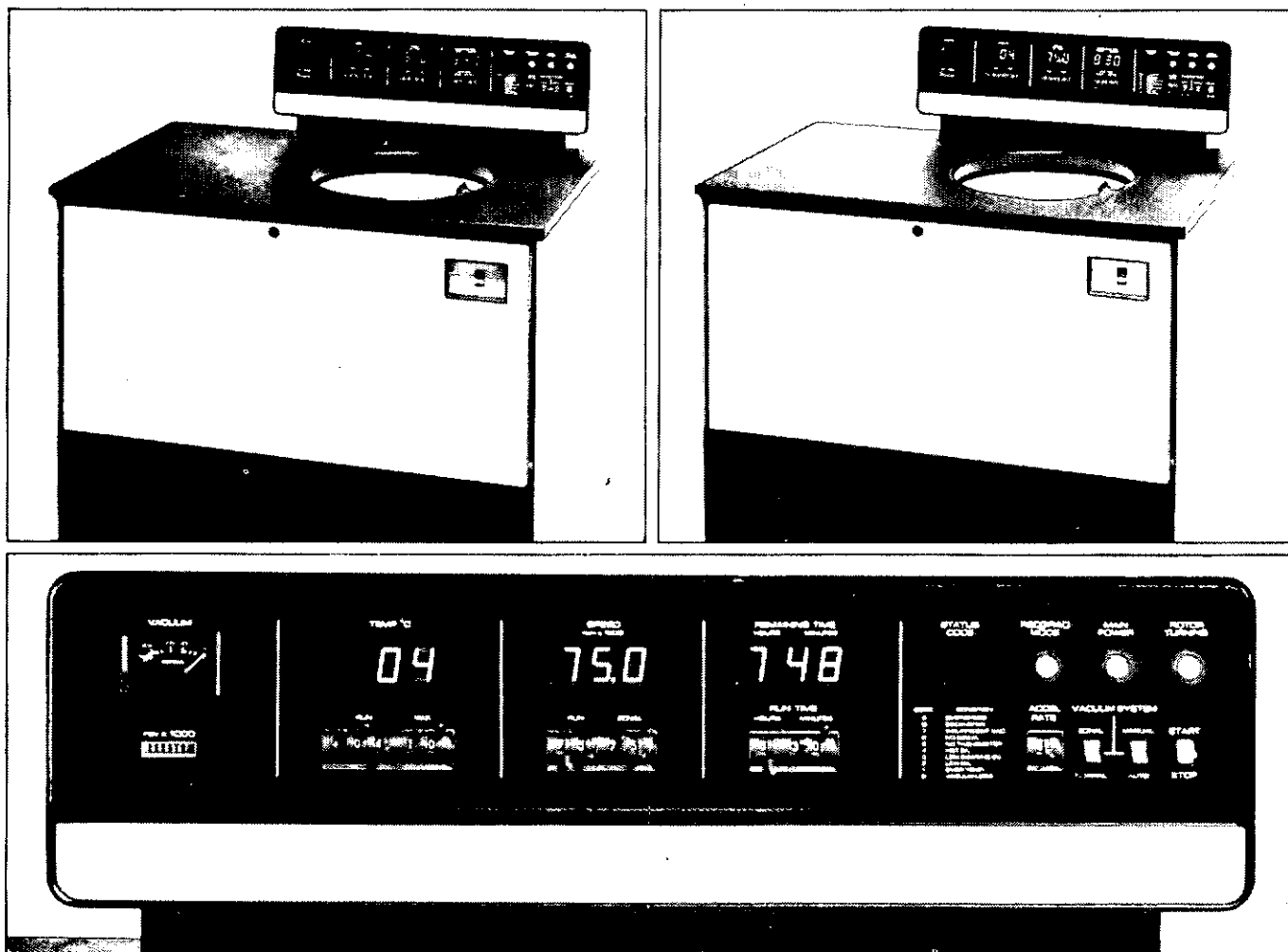
A free sample of Whatman Laboratory Sealing Film is offered by the New Zealand agents, Kempthorne Medical Supplies Ltd, circle 19 on the reader reply card.

TRIVECTOR AGENCY

Sci-Med are pleased to announce that they have recently become New Zealand distributors for Trivector Scientific Ltd, a UK company specialising in Laboratory Data Processing instrumentation, with a particular emphasis in the area of chromatography and continuous flow/FIA data processors. The company offers disc-based, multi-channel data processors which feature a unique graphics display capability allowing on-screen chromatogram comparison and manipulation. A foreground/background system architecture allows processing of stored data, even whilst new data is being acquired.

Trivector Scientific also produces systems for complete laboratory data management. System compatible software covers all aspects of chromatography, continuous flow, and flow injection analysis, thermal analysis, and spectrophotometry. More general software covers filing and disk management, archiving, word processing and multi-terminal BASIC. For further information, circle 20 on the reader reply card.

Sorvall® Ultracentrifuges OTD-50B • OTD-65B • OTD-75B



Microcomputer controls enhance reliability, performance.

The OTD-50B, OTD-65B and OTD-75B are improved versions of the Sorvall line of ultracentrifuges, with new microcomputer controls to enhance the already proven reliability, flexibility and performance of the instruments. Automatic rate control, a feature previously provided as separate components, now is a standard part of the convenient control panel. All the other outstanding features, including the unique oil turbine direct drive system, have been retained.

Sorvall OTD-B ultracentrifuges offer simplicity of operation and the flexibility to perform any preparative ultracentrifugation procedure, from routine to highly complex. The Sorvall ultracentrifuges are designed specifically to permit optimum performance in density gradient separations using either the traditional swinging bucket rotors or the reorienting-gradient vertical rotors developed by Du Pont in 1976.

Microcomputer Controls

The OTD-B ultracentrifuges are pre-programmed for accurate performance and operating simplicity. All of the individual controls employ state-of-the-art electronics for precise, dependable management of the run conditions. Run conditions are set and continuously displayed by convenient lever-switch dials, and remain visible throughout the run. They are retained until changed, even when the power is off. Actual run conditions are displayed continuously by precise, highly visible LED digital displays. A diagnostic indicator is provided, with coded signals to warn the operator of improper conditions.

Choice of Air or Water Cooling

All three models are available either with self-contained internal air cooling which requires no external plumbing, or with external water cooling.

CONSIDER THESE FEATURES:

PROVEN OIL TURBINE DRIVE

The exclusive Sorvall oil turbine direct drive provides reliable, trouble-free operation, and the smooth, soft starts and stops which are so important in delicate density gradient separations.

AUTOMATIC RATE CONTROL

The Reograd operation mode is a standard feature, offering a choice of 10 acceleration rates.

w²dt INTEGRATOR

Available as an optional accessory, the w²dt Integrator extends centrifuge capability and helps ensure run reproducibility.

PRECISE TEMPERATURE CONTROL

Temperature in Sorvall OTD-B ultracentrifuges is maintained to an accuracy of ± 1°C over a range of 0°C to 40°C.

AUTOMATIC OR MANUAL VACUUM

Both fully automatic and manual vacuum modes are provided for flexibility and operator convenience.

WIDE ROTOR SELECTION

The extensive choice of Sorvall and other rotors available for the OTD-B ultracentrifuges gives the user total flexibility in performing a variety of procedures.

For complete information please write or call:

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PHONE: 593-039

CHRISTCHURCH
P.O. Box 706
PHONE: 69-282

DUNEDIN
P.O. Box 921
PHONE: 777-291

NEW PRODUCTS

NEW AAS FROM GBC



GBC's new Model 903 single beam, microprocessor controlled Atomic Absorption Spectrophotometer is a high performance AA incorporating the following features:

- Monochromator with 33mm focal length, adjustable band pass and 1200 L/mm grating.
- Fully adjustable nebulizer with stainless steel or platinum/iridium capillary, titanium venturi.
- Very high sensitivity, guaranteed greater than 0.7 absorbance for 5 µg/ml copper.
- Automatic Deuterium Arc Background Corrector operating at 200 Hz modulation.
- Interlocked gas control with push button ignition.
- Time expanded mode of operation, which is useful to time resolve the atomic and non-atomic peaks occurring in non-flame analysis.

- Direct concentration readout/printout.
- Direct printer output via RS-232-C port to an Epson MX80 or other compatible serial printer. Operating parameters such as date, element, wavelength, slit width and atomisation are entered from the keyboard, the others are printed from the 903 memory.

System 1000 furnace sampler

GBC have also announced a microprocessor based graphite furnace and automatic sampler assembly for use with their Models 902 and 903 microprocessor controlled AA's.

NZ agents Advanced Electronics, for further information circle 21 on the reader reply card.

TLC STICKS

Among the many new items introduced in the New, 1984 Alltech/Applied Science Catalogue, is a range of TLC 'sticks'. This unique product is a solid stick of silica gel, which can be loaded with as much as 20ml of sample. A fluorescent indicator is incorporated into the stick to allow nondestructive visualization. Recovery is easily achieved by slicing the desired band from the stick, and extracting with an appropriate solvent.

The Alltech TLC stick is invaluable for separation and purification in the field of organic synthesis. It can be used for the clean up of samples prior to gas or liquid chromatography.

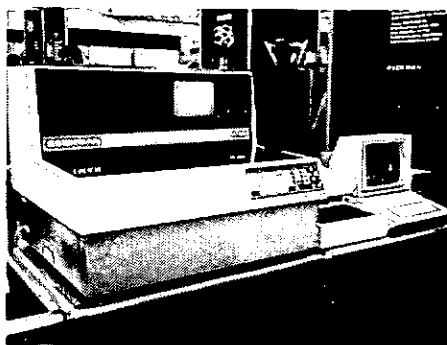
For full details circle 22 on the reader reply card.

BECKMAN'S NEW LIQUID SCINTILLATION SYSTEMS

The new LS-5801 Series Liquid Scintillation Systems provide the flexibility of 10 independent counting programs, the versatility of up to eight data reduction programs and the simplicity of one-button operation.

There are three models in the range, LS 1801, LS 3801, and LS 5801. Standard features include the accepted H number concept of quench monitoring and compensation. A multi-user capability allows the user to select and run a counting program at the touch of a

button or to edit and customize a program for a special requirement even while the system is in use. Programs may be interrupted for the urgent counting requirement of up to one rack with full protection of the interrupted program.



The VERSARACK sample changer processes standard and minivials in the same instrument without adaptors. You may also use economical, disposable, low-background plastic vials and get consistent DPM results.

The LS 3801 has a CRT display that enables custom formatting of data and display of programs. An EPSON printer is normally supplied. The LS 5801 contains a floppy disk for further data storage and manipulation.

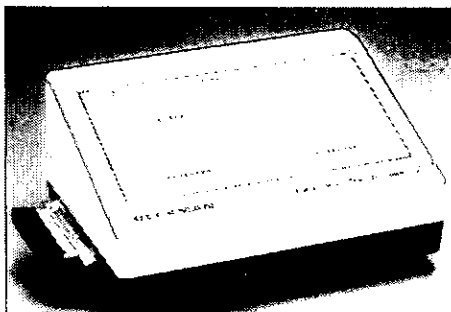
NZ agents Alphatech Systems, for further information circle 23 on the reader reply card.

BECKMAN CALIBRATION TEST ACCESSORY CHECKS UV/VIS SPECTROPHOTOMETERS

A calibration test accessory from Beckman Instruments, Inc. provides automatic performance checks for the company's DU-6 and DU-7 UV/Vis spectrophotometers. It is especially useful in industries where self — or outside regulation is necessary.

The accessory does instrument performance verification, including numerical evaluation of photometric accuracy and repeatability, resolution, noise and percent stray light. There is no need to use liquid solutions for the performance checks. Hard copy of all data is provided.

NZ Agents, Alphatech Systems Ltd. for further information circle 24 on the reader reply card.



BECKMAN SPECTROPHOTOMETER ACCESSORIES ENABLE FAST QUANTITATIVE ANALYSIS

Quantitative accessory systems for the DU-6 UV/Vis Spectrophotometer from Beckman Instruments, Inc. increase the accuracy and reduce the time required to make quantitative measurements by performing the calculations automatically. The instrument analyzes the data and displays the answers on its integral video display.

Providing easy quantitation from a wavelength scan, the Quant I System includes Peak Pick and Scan Search routines. Peak Pick, an automatic peak locator, displays peak values on the screen and prints them out on the accessory Printer/Plotter for accurate determinations of the wavelengths of maximum absorbance. Scan Search eliminates the need to count squares on chart paper to determine absorbance values at any point along the spectrum, simplifying spectral interpretation.

The Quant II System provides fast concentration determinations. For accuracy a series of standards is fitted to either linear or non-linear curves using a quadratic equation. Curve fit parameters are stored to eliminate the need to rerun standards. Sample replicates are averaged. Sample concentrations can be corrected for varying sample weight to eliminate time-consuming exact weigh outs.

Featured in the Quant II System is automatic quantitation of up to five components in a mixture. Calibration is automatic, using standards that also may be mixtures to correct for component interaction. Calibration parameters are stored to simplify future analyses. Sample replicates are averaged. Sample concentrations can be corrected for varying sample weight. NZ Agents: Alphatech Systems Ltd. for further information circle 25 on the Reader Reply Card.

NEW PRODUCTS

ION CHROMATOGRAPHY FROM WATERS

A new family of Ion/Liquid Chromatographs is now available from Waters Associates.

The ILC series has been designed to give the extreme sensitivity needed in many ion analysis applications yet still provide the proven standard of reliability traditional with Waters H.P.L.C. systems.

The ILC systems incorporate several advances in HPLC/ILC capabilities:—

- Durable resin based column chemistries for greatest eluent flexibility for all anion and cation separations.
- Innovative electronically suppressed conductivity detection with wide linear dynamic range and unparalleled stability allowing routine measurements from low ppb to high ppm levels.
- Comprehensive control of all chromatography operations from M590 programmable Solvent Delivery System including flow programming, automated in-built pre-column trace enrichment and injection, sample stream sampling with valve control, switching etc.

The ILC series is fully compatible with all existing Waters HPLC modules for greatest versatility in methodology, allowing full automation and attended analyses of up to 96 samples per batch, or use of alternate column/detector strategies for both ILC and HPLC.

The Waters Modular approach allows individual ILC components to be obtained separately and can thus be added to existing Waters HPLC systems without compromising performance.

NZ agents Alphatech Systems, for further information circle 26 on the reader reply card.

COVER STORY

Euroform is a patented non-toxic material moulded into benchtops, shelves and fume cupboard bases which displays exceptional resistance to acids, chemicals, heat and surface wear.

Euroform's gloss finish has been developed to withstand all but the most extreme treatment from acids and chemicals. In tests reagent was left standing on a benchtop surface. The chemical covered with a watch glass for 24 hours washed clean.

Very few surfaces can withstand direct exposure to a naked flame without suffering severe and unsightly damage. Euroform when exposed to a bunsen flame for 30 seconds suffered only faint discolouration.

In another series of tests to establish resistance to dry heat, an aluminium pot containing oil at various temperatures was left standing on the Euroform for 20 minutes. The standard allows a slight loss of gloss at 180°C. Euroform retained its gloss to 220°C. Euroform is one of the hardest wearing laboratory surfaces available anywhere. In a series of scratch, scrub and chip resistance tests Euroform's performance far exceeded specifications.

Euroform is a one-piece high density slab manufactured from non-toxic mineral fillers and polyester resins, problems of delamination from benchtop substrates and lifting of surface finishes is completely eliminated.

The smooth gloss finish is easily cleaned by wiping down with a damp cloth and

occasional use of a household cleanser containing no abrasives.

The range of Euroform profile options includes an integral anti-spill edge which, while adding a distinctive design element to laboratory work surfaces, effectively stops glassware rolling off benches and prevents spill acids and chemicals from splashing onto clothes or down cupboard fronts.

Although it is recommended that Euroform be installed by trained personnel, the material is easily sawn and drilled with conventional tools. Because it is a high-density one-piece slab it requires no worktop substrate.

Since its development, Euroform has been used in numerous major applications including the Atomic Research Centre in Malaysia; Philippines University, Leyte; Dow Chemical (Aust) Ltd, Melbourne; Armstrong Nylex Laboratory, Melbourne; Blood Transfusion Centre, Auckland; N.Z. Steel Laboratories, Glenbrook; ICI Tasman Laboratories, Wellington.

An example of Euroform versatility is its use as benchtop material in the Cordon Bleu Cookery School, Auckland.

COMPUTING INTEGRATOR FROM SPECTRA-PHYSICS

The SP4270, a low-cost computing integrator for the chromatography laboratory can be used either as a stand alone single or dual channel computing integrator, or it can be used to form a multichannel data system using Spectra-Physics' unique LABNET laboratory communications system.

The SP4270 base unit is a single channel integrator with a 32-key functional keypad, 8½ inch high speed (49 characters per second) printer-plotter, 16K bytes by RAM memory, BASIC programmability, and 50 Hz data sampling.

Standard features in the compact unit include full alphanumeric peak and sample names, multilevel calibration, dynamic peak integration algorithm, timed programmable integration parameters, 20 method files and 20 peak storage files.

A tabular dialog prompts the user through all entries needed for the standard calculation procedures including normalization, internal standard and external standard. Multilevel calibration can be done using either a linear or non-linear least squares fit. Also included in the SP4270 are statistics calculations, peak heights as well as areas, peak grouping, area slice, minimum area and minimum concentration. Custom concentration units and the analyst's name can be entered also.

Three optional plug-in, cartridge-type modules are available. One provides LABNET and RS-232C communication, allowing the creation of a multichannel data system; as many as 20 dual channel SP4270's can be interconnected. The RS-232C port allows a variety of computer peripherals to be interfaced to the SP4270, including cCRTs, flexible disk drives, modems and computers.

Another option module provides integration of a second analog signal completely independent of the first channel. The third option allows control of external devices using six TTL level outputs per channel, as well as BCD inputs for autosampler tray and vial readings and remote start/stop capability.

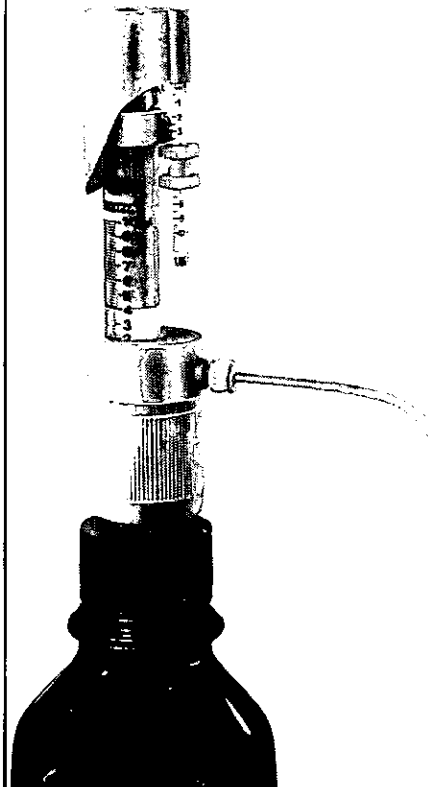
BASIC built into the SP4270 allows customer programming capability. The ROM overlay feature allows the user to modify the instrument's dialog and report for special applications. The SP4270 can also function as an X-Y plotter using BASIC.

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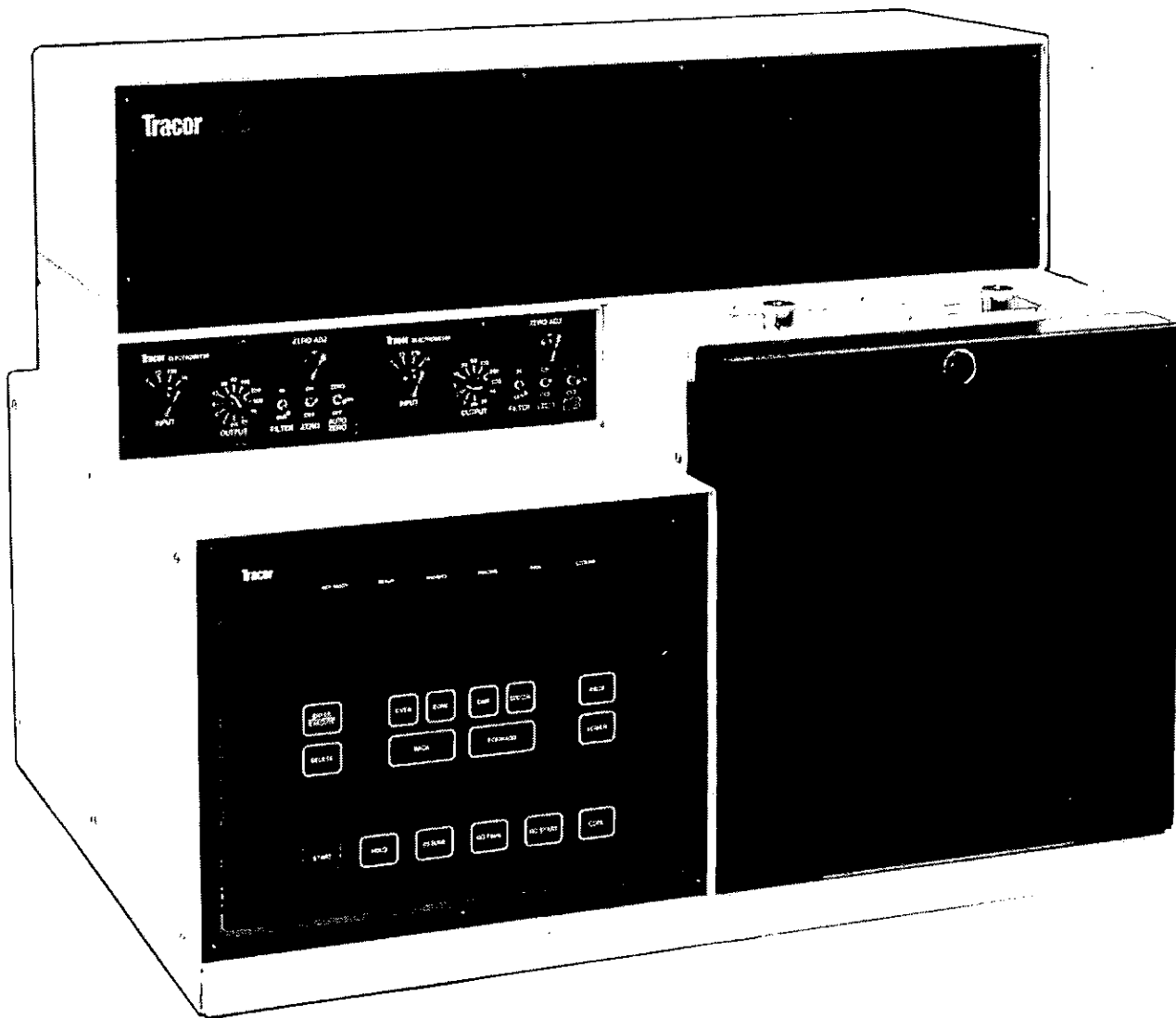
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