Vol. 56 No. 2 April 1992

NZIC

Chemistry

IN NEW ZEALAND

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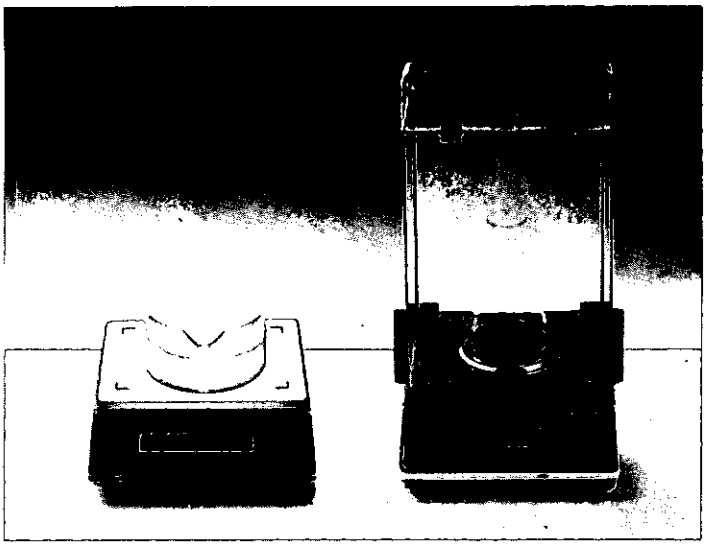

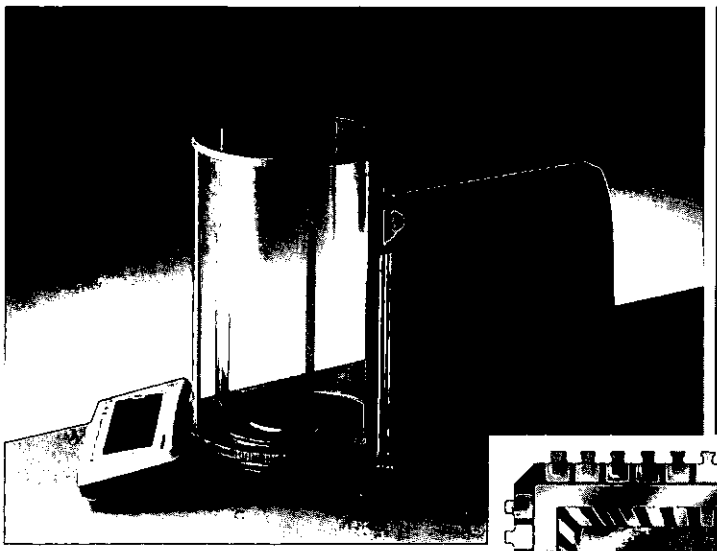

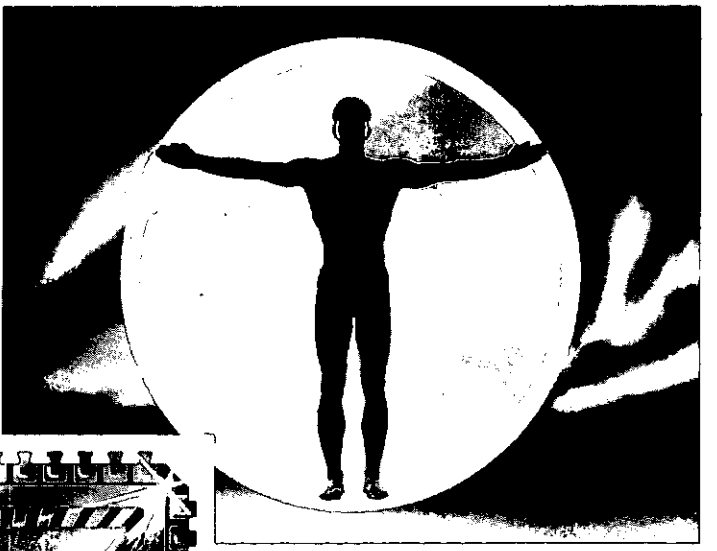

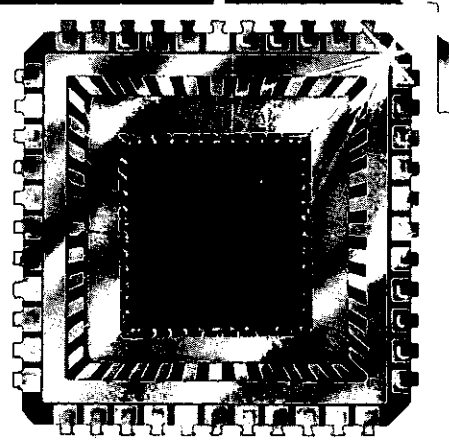

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COUNCIL CONSIDERS THE FUTURE ROLE OF THE NEW ZEALAND INSTITUTE OF CHEMISTRY IN THE SUPPORT OF CHEMISTS

The major changes that have taken place in the ways in which science and particularly Public Good science is funded organised and managed have lead the Council of NZIC at its February meeting to consider how best the organisation can now assist its members in the still developing situation.

On the political front there have been useful discussions with the Minister, Simon Upton and the Public Affairs Committee has made a number of submissions. (The submission on Long Term Science Priorities is reproduced elsewhere in this issue). Although these submissions are well prepared and promptly presented the process of change seems to have advanced so far and so fast following agendas known only to a few that the infulence NZIC can expect to have will be small. An area that has concerned Council is the current and future welfare of members. The protection previously offered chemists in State funded organisations by way of security of tenure pensions and well defined salary structures has diminished with the formation of Crown Research Institutes the introduction of contestible funding and the implications of the Employment Contract Act.

Virtually all chemists will now be employed by independent businesses, the ownership of which may be either public or private. Therefore chemists doing similar work might expect to receive similar rewards. Whether the rewards with respect to salary, conditions and assessment of worth will be in fact similar or fair is what is of concern to Council.

Being employed by an independent business brings with it a number considerations which should be of interest and concern to any science professional not the least of which is how do the managers of the business view the worth of, for instance, a chemist.

The business oriented environment brings with it a number of economically related realities which must always be kept in mind. People will be hired, fired, reallocated to new tasks, retrained, relocated or retrenched according to the operational needs of the business ahead of any other consideration.

Employment contracts may well be for limited tenure to suit projected work loads, funding restrictions or market pressures. Salaries are likely to be determined by the tasks the chemist is expected to carry out rather than as a reward for exceptional skills or outstanding qualifications. Many staff selections and promotions will be based on the demonstrated or potential ability to manage and lead people in groups or teams and having an understanding of basic business

Continued on page 21

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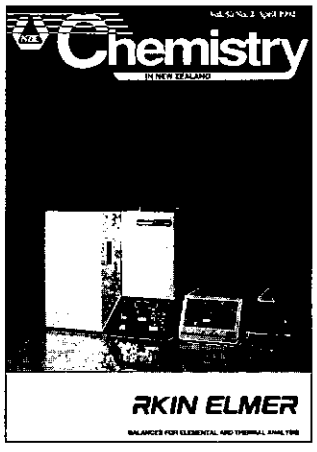

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Advertising: Carl Roze, Ph: (09) 521 -5151
Roger Whiting, Ph: (09) 377-3570
Commercial Editorial: Roger Whiting.
Branch Editors:
Auckland: Dr. Robyn Somerville, Mt Albert Research Centre DSIR, Private Bag, Auckland.
Waikato: Ron Newth c/- Chemistry Dept, University of Waikato, Private Bag, Hamilton.
Manawatu: Dr. Michael Boland, New Zealand Dairy Research Institute (NZDRI), Private Bag, Palmerston North.
Wellington: Adrian Bennet, BRANZ, Private Bag, Porirua.
Canterbury: Dr. Robert J. Martyn Chem. Division, DSIR, PO Box 29-181, Christchurch.
Otago: Dr. George Emerson, Bio-Chemistry Department, University of Otago, PO Box 56 Dunedin. Published on behalf of the New Zealand Institute of Chemistry (Inc)
PO Box 12-347, Wellington. Ph: (04) 473-9444. Fax (04) 473-2324
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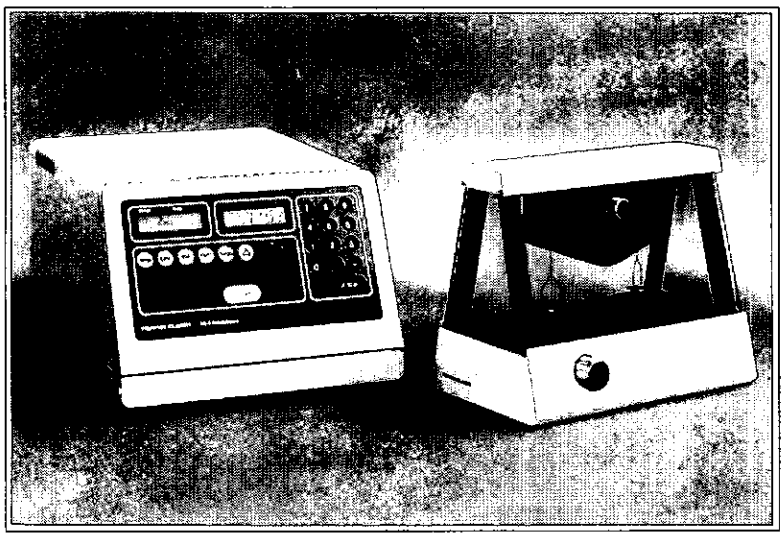
THE HUMBLE BALANCE

By Roger Whiting

Developments are taking the field of weight measurement to new lows!

The balance is the most fundamental of the chemists tools. Every analytical measurement that the chemist carries out relates back through secondary and primary standards, dilutions and transfers to some weighing operation. Thus it represents the key to accurate analysis.

In terms of its technology the balance has only relatively recently moved away from the basic design which first appeared four thousand years ago. It was only after the Second World War that the mechanical analytical balance based on the substitution weighing principle became cheap enough to appear widely. The new Mettler and Sartorius balances I used in stage 1 chemistry were so sophisticated and modern. Now everyone in the lab ignores the mechanical balance, (kept in use because there is "really nothing wrong with it") and they queue up to use the digital. After all, who wants to fiddle around twiddling knobs and levers?
The beam balance has however made a come back albeit in a much reduced and more accurate form as the Perkin Elmer AD-4 and AD-6. These are illustrated in figure 1.



The Perkin Elmer AD-6 balance.

The first aspect of these new balances which strikes the observer is the fact that they are constructed in two sections one being the weighing head and the other an electronics and control box. This has advantages in allowing the measuring head to be remote from the electronics and readout eg in a fume hood so that highly toxic materials can be more safely handled.

A close inspection of the weighing head will reveal that it has two weighing pans just as in the beam balance of old. One pan is a tare pan and the other the sample pan. To weigh a sample it is possible just to put the sample in the sample pan, select the appropriate weight range and read off the sample weight. Clearly an advance on the old system. However to gain improved accuracy one can put a tare weight in the tare pan. The more closely this can match the sample weight then the lower weight range setting can be used to read the sample weight. With the use of a lower weight range comes a more accurate reading.
The balance operates by use of a torque motor. The torque motor brings the beam back to its zero position and the weight of the sample pan relative to the tare pan is calculated from that torque. The closer that torque is to zero the more accurately it can be measure so that if the sample pan and the tare pan are nearly matched then the accuracy is maximised. With a Standard deviation of 0.2µg in the most accurate range then samples can be weighed to a standard deviation 0.4µg.

SHEEN FROM CHEMIPLAS

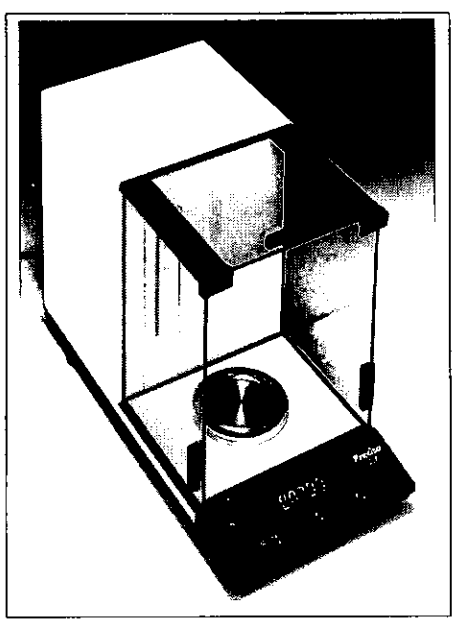
Another balance development to appear in New Zealand is the portable digital balance now marketed by Chemiplas. These are made by Sheen Instruments of UK and have built in battery and recharger so that while plugged into the mains they recharge and then can be used in the field without mains power. They can also be run from a 12VDC output from a car.
These balances come in three ranges 100g 500g and 3Kg. Their main market appears to be in field measurements.

METTLER FROM WATSON VICTOR

The METTLER AT series of balances now available have pushed the readability down to 2µg for a balance with a weight range of 22g. This is the specification of the new AT20.
The primary interest here is in methods where relatively heavy tare weights are requires eg platinum boats for small sample weights. The operation of the AT20 series balances are the same as the other AT balances.

SHIMADZU FROM DOUGLAS SCIENTIFIC

Shimadzu is a relatively new name to the field of balances in New Zealand although they are well established in Japan. The AEG series of analytical balances are proving popular with a rugged construction which makes them look a little old fashioned especially with the non-backlit liquid crystal display.
They do however incorporate a calibration weight system which can be calibrated against national standards to give a traceable weight standard which will comply with the requirements of ISO 9000. The calibration system is also automated so that the balance is automatically recalibrated when it is turned on, every four hours if no weighing is in progress and if the temperature changes more than a certain amount since the last calibration.
This type of automatic calibration system is appearing in a number of balances from a number of suppliers and is an indication of the way the total quality management principles are effecting industry world wide. This is creating in turn new demands on the instrument suppliers. However Shimadzu have also incorporated it in their top pan as well as well their analytical balances.



The Precisa 120A from Lab Supply Pierce

SARTORIUS FROM WILTONS

Sartorius are making a strong showing in the New Zealand market with three ranges of balances the Basic range the MC range and the RC range. All these ranges feature backlit liquid crystal displays which improve readability.

The RC range represents something of a break from the traditional layout of the electronic analytical balance in that the weighing chamber is cylindrical and the readout is pivotable to either side of the chamber. This is designed to give more ready access to the weighing pan. They boast a readability to 0.01mg and an automatic recalibration system. The MC range covers a wide range of laboratory and industrial weighing ranges with readability down to 1mg and capacities up to 34Kg. One of the features of this series is the ability to service the machine via an RS232 connection to a diagnostic programme.

The RC Series balance with electronic opening doors and MC 1 technology.

To close perhaps the saddest comment on the state of the laboratory today is the Sartorius MC and Basic ranges come with a lug cast at the back of the chassis to enable the balance to be chained to the bench because so many of the sales are replacements due to theft.

COUNCIL CONSIDERS NZIC ROLE *Cont from page 19*

economics as well as having adequate scientific ability. Managers of chemists may well be less well qualified scientifically than those managed. The ability to understand and interpret the real needs of the clients of the business and then reporting research or other findings to them in an easily understood and useful fashion will be more important than writing an elegant piece of scientific jargon. The ability or right to publish interesting, career enhancing, research findings will depend strongly on the policies of the business and the wishes of its clients. Chemists in common with all other employees of the business will be valued for the ways in which they can be used to earn revenue rather than for their ability to do outstanding but possibly low cash return research.

In such an environment chemists will be rewarded for how well they perform the tasks they have been hired to carry out rather than as the specialist they may believe themselves to be. In most businesses the tasks will be described in some form of written job description against which the chemists performance will be rated. These job descriptions are likely to be strongly oriented to the needs of the business rather than to the individual. In considering the value or rank of a particular job in a organisation a number of factors are usually considered which have little to do with the technology involved. These might include:- the extent of needed people interactions within the organisation and externally and the organisational rank of these interactions; the technical know how, experience and training needed to do the work effectively; the nature and difficulty of needed decision making; whether the work is routine or creative; how much money is managed, spent or earned by the responsible person, and the responsibility for management, direction and training of staff.

It is against this background that NZIC Council is exploring ways in which it might assist members in dealings with their employers either on an individual or a collective basis. On behalf of members Council intends to obtain general information on how chemist and other professional scientist jobs are described how these tasks are ranked and how the performance of individuals against these descriptions are assessed and rewarded. As every business is likely to place a different emphasis on each element of a job specification and have different ideas about how well an individual is performing and is unlikely to divulge specific information it will take time to build up more than an overview of the job market for chemists.

Only when all the new organisations employing chemists finally establish their organisational structures and their reward systems and when Council has gained some general appreciation of what is happening will it be possible to establish whether or not chemists as a group are being fairly dealt with. In the meantime members who feel that they need more information about or assistance with matters related being employed as a science based professional should write to the General Secretary outlining their needs or concerns.

SUCCESS AND FAILURE IN COMMERCIALISING CHEMISTRY RESEARCH

Gordon Leary. Director, DSIR Chemistry

Based on a talk given to the NZIC 1991 Annual Conference, Christchurch.

Background

After a history of 126 years, DSIR Chemistry hasn't gone broke and we have maintained our focus and ability to do good chemistry. DSIR Chemistry will disappear on 30 June 1992. Before this happens I would like to share with you some of our experience in attempting to commercialise our science. I will be talking from the point of view of an organisation that has learned to make a "business" of chemistry research, development and services. We have been successful financially (Table 1) and scientifically. On 30 June next year the CRI reforms will dissipate the greatest team of chemists this country has ever had within one organisation (Table 2).

TABLE 1 **DSIR CHEMISTRY STAFF AND FUNDING**

Year	Staff Numbers	Total Income	Commercial Income	Fixed Assets (excluding land and buildings
1986/87	267	$13.5M	$9.4M	$3.0M
1987/88	277	$15.0M	$10.4M	$3.9M
1988/89	277	$20.5M	$12.5M	$3.8M
1989/90	293	$22.0M	$14.0M	$7.2M
1990/91	316	$24.8M	$17.4M	$8.5M

TABLE 2 **SCIENTIFIC + TECHNICAL STAFF 1990/91**

	NZCS	BSc	HONS/ MSc	PhD	Other
Permanent	42	20	43	98	-
Temporary	1	4	5	2	-
Research Fellows	-	-	-	5	-
Vacation Students	-	-	-	-	25
	43	24	48	105	25

Our mission is to apply chemistry research and services to the benefit of New Zealand (fig. 1). We do this by meeting the needs of customers as well as maintaining a strong base of chemistry skills, equipment and facilities. The types of skills we have chosen to specialise in are revealed by our programmes, which are grouped into five separate client- oriented groups (fig 2). Each group knows its market and its important customers. One (Support group) is paid for by the others, who are its clients. The other (Forensic, Environmental Health, Inorganic and Physical Research and Organic Research focus on specific client sectors (including FoRST) whose needs they must satisfy, now and in the future. Clients are our only significant source of funds and they will only continue to come to us if we continue to give them what they want. The information, advice, analytical results, new chemical processes or products we produce must be timely, relevant and useful to somebody, whether we are talking about "technology push" or "market pull".

FIGURE 1

MISSION STATEMENT

Making chemistry work for New Zealand
through excellence
in research, application,
and client service.

FIGURE 2

ORGANISATIONAL STRUCTURE

DIRECTOR

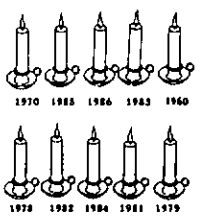
Group Manager Forensic	Group Manager Health	Group Manager Research	Group Manager Research	Group Manager Support
Crim/Bio	Engineering/ Electroacoustics	Organic Chemistry	Environmental & Physical Chemistry	Administration
Drugs/Alcohol Toxicology	Environmental Organic Chemistry	Applied Organic Chemistry	Inorganic & Materials Chemistry	Finance
	Food/ Occupational Health	Organic Spectroscopy	Computing/ Statistics	Human Resource
	Pharmaceuticals	Instruments	Draughting	Marketing
	Quality Assurance	Glassblowing	Photography	

I'm going to share with you an audit of 10 of the Division's major efforts to commercialise chemistry since I became its Director in 1981.

There were many other projects I could have chosen to speak about, but whatever the selection, the overall balance of success and failure and the long lead times would have been similar. All of the projects have been successful as research projects but you will find that most are failing commercially for reasons other than their science.

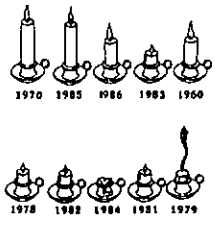
Ten innovations sitting on the line ...

FIGURE 3.



Each of the 10 investigations started as a bright idea, a burning candle full of promise. Five were in response to a client enquiry, five were opportunities we identified ourselves. The four "successful" commercial projects fall equally into these technology-push, client-pull categories. In all cases the clients' enquiries were just the starting points that triggered a larger proposal.

IT TAKES A LONG TIME TO COMMERCIALISE RESEARCH. The first thing to note is that the projects have been worked on, in one way or another, for up to 30 years (fig. 3). And, although we are only confident that four of the 10 will give a net positive financial return, only one candle is fully extinguished (project totally terminated). A frustrating number are still smouldering!



... one lost its owners ...

10 Motonui Durene

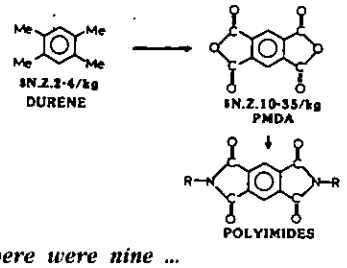
1979

A successful commercial project needs a champion and durene's champion, Ian Miller, had the idea in 1979 that durene should be isolated from Motonui heavy gasoline and converted to polyimides via pyromellitic dianhydride (PMDA) (fig. 4). Durene is a crystalline solid that is one of the most striking products that is formed when methanol is reacted within the zeolite cage of ZSM5. Mobil had proposed to hydrocrack it into liquid hydrocarbons which would be added back to the gasoline stream. Ian pointed out that PMDA and polyimides should be worth a great deal more than hydrocarbon fuels. He did some research and promoted the idea that New Zealand should extend its petrochemicals industry using durene. Because durene was not available in commercial quantities elsewhere in the world, New Zealand would, for a few years at least, have a competitive advantage.

Ian Miller took leave from DSIR to found a small company, together with Mark Chambers. The company "Applied Chemistry Limited" persuaded ICI (NZ) to enter into a 40:60 (ACL:ICI) partnership. New Zealand would benefit from value-added export sales and increased employment. DSIR Chemistry would hope to benefit through R & D contracts for the enterprise.

ICI put a lot of effort into investigating the proposal, especially the market for durene-derived products and the joint ACL-ICI venture negotiated a supply agreement with the New Zealand Government. Complications arose, however, over the role of Mobil and the ownership of the Maui gas supply and the durene produced. In the end the proposal has failed because of this confusion and a lack of commitment by the "owners". A commitment to the project by Government, Mobil, or subsequently by Petrocorp (the current owners of the Motonui plant) would have made all the difference. Someone other than ACL-ICI had to support the increased risk of a durene-based industry. The conservative "gasoline-only" scenario was safer, but I am sure it would not have been the path chosen by say, Japan, if the durene resource had been in Japanese hands.

FIGURE 4.



... and then there were nine ...

... Nine innovations at the starting gate
One's stuck at pilot scale ...

9. A Wairaraparapa Agar/Agarose Industry

1981

The initial champion of Wairarapa Agarose was also Ian Miller (supported by Richard Furneaux). Entrepreneurial innovators, like Ian, are essential but hard to find; they lead a stressful life, especially in difficult financial times.

The agar story begins in 1980 or 1981 when Ian was approached by a Wairarapa farmer who wanted to know if there was a simple method of separating the red algae, pterocladia, from the mass of mixed weed that is washed up on Wairarapa's beaches. Pterocladia produces good agar gels but, traditionally, it has first to be carefully separated by hand from other, more common, seaweed species.

Ian took up the challenge by developing a process that enabled the mass of mixed week to be treated without prior manual sorting. He and Richard Furneaux - together with one of the companies subsequently involved - then took the process a step further by extending it to produce agarose directly. Agarose is a highly purified form of agar that attracts a high price (fig. 5), depending on its gel-strength and colour. It is used in speciality applications (e.g: gel electrophoresis).

FIGURE 5

APPROX. VALUES	
Agar	$NZ45 - 100/kg
Agarose	$NZ 350 - 8000/kg

There is a growing world market for agar and agarose and the process has been taken to pilot scale. But finding investment for the next phase - manufacturing - is proving difficult. There has been a succession of potential investors, none have yet made the final commitment necessary to establish a manufacturing plant.
... now there are eight ...

... Eight innovations on their way to heaven
One's not cost effective ...

8. Herbicides from waste paper

1984

This project has run through all its stages and has now expired. But it took a great deal of innovative effort and it very nearly succeeded in giving New Zealand a big return - the product was aimed at a several hundred million dollar market. Despite failure of the project itself, the Division has benefitted by spin-off, because the project attracted the support of a large multinational (ICI) which now has faith in us and has continued to financially support other proposals.

In the early 1980's Richard Furneaux and Tom Stevenson were trying to optimise the production of laevoglucosenone from cellulose (waste paper or wood) (fig. 6) and were looking for interesting products to make from it. One of Richard's group, reading the literature, noticed that bicyclic ethers derivable from laevoglucosenone were similar to bicyclic ether herbicides already in commercial use (fig. 7). Ron Henzell at Ruakura, tested "PT9" for herbicidal activity and we found we had discovered a whole new class of unpatented bicyclic ether herbicides.

FIGURE 6

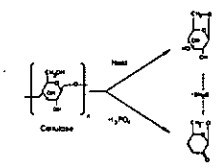
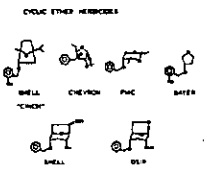


FIGURE 7



ICI came into partnership with us - we would make the compounds, ICI would test them. We had to send gram quantities of a series of analogues to the United Kingdom for testing in ICI's Agrochemical Division. The compounds were screened for toxicity, stability, volatility, activity, selectivity, etc., against the weeds of major crops (maize, rice soya, wheat, corn). Unfortunately, in the end the most active compound was found to be too expensive. It could only be made in 14 synthetic steps from laevoglucosenone. The less expensive compounds were not active enough.

After six years, the project was concluded. Patent protection was starting to run out. Our competitive advantage in this venture was based on Kiwi ingenuity and imagination, backed by highly developed synthetic chemistry skills. The project was of high risk and even though the commercialisation failed it is in one sense on-going - it established our credentials as a worthwhile partner for ICI.

... now there are seven ...

... Seven innovations can do some clever tricks,
One's short of capital ...

7. Geothermal Gold and Silica Terraces


1982

For several decades DSIR Chemistry has pioneered work on geothermal and epithermal chemistry. Our early investigations underpinned development of Wairakei geothermal power. Our accumulated understanding of geothermal high temperature high pressure fluids has led to other commercial opportunities. I want to talk about extraction of gold and formation of new terraces.

Terry Seward and others have discovered that in hot (300°C), H_2S-saturated pressurised aqueous fluids, gold is dissolved from rocks and transported as a sulphide complex.

$$Au + H_2 + 2HS^- \rightleftharpoons Au(HS)_2^{2-} + H_2$$

As these hot pressurised fluids rise towards the surface they reach a point (about 260°C) where the pressure drops sufficiently for water and steam to separate. Most of the hydrogen sulphide flashes into the steam with a catastrophic effect on the solubility of the gold which precipitates along with other minerals. In 1983 Kevin Brown found that high pressure geothermal water pipes at Ohaaki Broadlands were lined with a gold rich deposit. Kevin estimated that several grams of gold were being deposited per day throughout the piping. He realised we could then design a system to collect gold from sulphide rich geothermal waters. Following this discovery one company has spent limited funds investigating this potential for "gold on tap". No-one is doing it commercially. It will require further investment to demonstrate the process is viable.
Almost as often as it is said that tourism is a growth industry, it is said that science and research can make little contribution to it. This is short sighted. We have proposed development of new silica terraces at Wairakei as a tourist attraction.

There is abundant silica being deposited from the waste Wairakei geothermal fluids. The deposits would build up quite quickly on a firm base to give a white terrace. We know the chemistry of the original pink terraces and could also reproduce the pink colour using the same natural minerals. Our proposal for silica terraces and a tourist attraction was taken up by a subsidiary company of Wilkins and Davies but since the latter were a victim of the stock market crash, little has actually happened.
Shortage of capital is holding up these two geothermal opportunities.

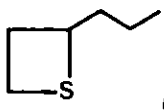
... now there are six ...

... Six innovations to help NZ survive
One needs more champions ...

6. Mammal Pheromones


1978

We believe there are many commercial ways of using mammal pheromones but we are having difficulties finding biologists willing to study effects of pheromones on animal behaviour.
Doug Crump started mammal pheromone research in the 1970's in response to a Wildlife Service request to help them control ferrets and stoats that were attacking black stilt nests and notornis. He identified and subsequently synthesised several novel sulphur ring compounds and in conjunction with Canadian workers found that 2-n-propyl thietane (1) and 3-n-propyl-1, 2-dithiolane (2) were effective as predator odours (kairomones).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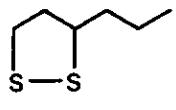
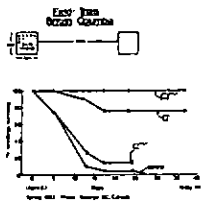

(2)

Samples of either compound either frighten animals like snow shoe hares, moles or gophers which are the prey of stoats. The compounds could thus be used to protect plants, eg, pine seedlings (fig. 8) against browsing. Any old sulphur compound will not do. A Canadian company has undertaken successful forestry trials with the compounds that we have sent them. Despite local concern over pests like rabbits and an unwillingness to reintroduce myxamatosis or to use 1080, similar applications have yet to be investigated in New Zealand.

FIGURE 8



... now there are five ...

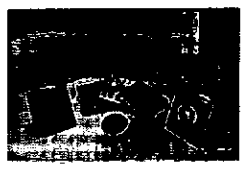
... Five innovations at the market door
One's still being tested ...

5. Glass-Irons and Ceramics


1960

We have a patent with Tom Hills of Silicon Industries, Hamilton for the production and use of glass -ironsand ceramics. The technology is relatively low cost and has low energy requirements.
The initial development was done in 1983 in response to a request from Tom for us to investigate the potential for using ironsands. Since then we have made many prototypes, (fig. 9) had a number of potential industrial partners but no ironsand product has reached the production stage. At the moment water filters are being tested in several municipal water works and a Maori Business Development contract has been let for making ceramic portaits for tombstones. We are relying on the joint patent holder to complete field trials and to market the filters. Commercialisation is a slow process. If it relies on a third party it inevitably has to meet their timetable.

FIGURE 9



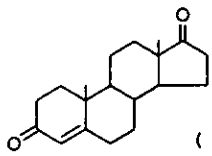
... now there are four ...

... Four innovations looking good to see
One's gone to MafTech ...

4. Androvax


1983

Androvax is hormonal treatment to induce ovulation and hence prolific lambing in sheep. Our contribution was to conjugate androstendione (3) to serum bovine albumen.


(3)

MafTech was to test the product and then to package and market it. Because there is a big home market and MafTech is in close touch with it, this is a straightforward success story. The product is producing results in the field and it is now being marketed in the United Kingdom and Turkey. It obviously helps to have the market and marketing strategy in competent hands right from the start but even here, eight years after the research and development was completed, there has been no financial return to DSIR Chemistry.

... now there are three ...

... Three innovations with little more to do
One's made no profit yet ...

3. Deuterium Labelled Drugs


1986

Our deuterium labelled drugs have been available for three years and overall the project is at the breakeven point in the "S curve". The project has been a success because we have a reputable company selling the products and both they and us can assess and influence the market. The opportunity comes from the unique "niche" DSIR Chemistry is in. DSIR Chemistry is possibly the only laboratory in the world with both a strong organic synthetic capability and a practical interest

in post-mortem toxicology. The skill to make the drugs comes from the synthetic organic chemists. The licence to make them comes from being a government laboratory. We have the ability to trial the application of the deuterium labelled drugs because we do post-mortem toxicology.

The post-mortem toxicologists have to assay post-mortem drug levels. They use GCMS and add the labelled drugs at the start of the assay, using them to quantify the unlabelled drugs found.

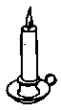
The first beneficiaries of the product are therefore our own toxicologists. The wider market is in post-mortem and illicit drugs and toxicology laboratories around the world. We influence it directly through toxicologist to toxicologist contacts, conferences, scientific publications, etc.

Interestingly, we did not anticipate some of the uses for our labelled drugs. As for most inventions, the actual market has its own view of the product.

... now there are two ...

... Two innovations shining in the sun
One's an in-house service ...

2. DNA Typing

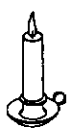

1985

DNA typing is a service we provide to our forensic clients, particularly the New Zealand Police. It was a new technology in 1985 and one that DSIR Chemistry needed to have in order to give the forensic clients the state of the art science they require. We thus had an interest and some direct control over all the important parts of the commercialisation. We were in a strong position to advise the client and to help them understand and benefit from the technology and we were able to sell them the idea that they should help pay for the development. The development was tuned to their specific needs, including the need to present the evidence clearly and competently in court. A major benefit would also be outside the court room through saving the Police time in an investigation by using DNA typing to eliminate suspects. The "DNA package" was sold to the Police and the first case using DNA went through the courts earlier this year.

... now there is one ...

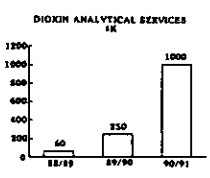
... One innovation showing how it's done
Making export money ...

1. Dioxin and Benzofuran Analysis


1970

Providing an expert dioxin and benzofuran trace analytical service is earning the Division a significant and increasing annual revenue (fig. 10). As with other financial successes we have developed our skills over a long period (since 1970) and with local clients in the home market. Our laboratory is the only one with the full trace dioxin capability in the Southern Hemisphere and one of the very few in the world that is recognised by the World Health Organisation. We have therefore been able to serve the bigger, more lucrative Australian market.

FIGURE 10



Because it is a continuing service we are selling we have to go to great lengths to meet the needs of our clients for accurate, presentable and understandable results on time. We use sub-contractors or other overseas agents when this is appropriate but retain control over all the critical factors needed to market this service including before and after sales service and interpretation of results. Our biggest concerns are the way this work monopolises the gas chromatograph and the GCMS and what our future work should be when dioxin is no longer the issue. Success has its price.

... Now my story's done.

NZIC SHELL INDUSTRIAL AWARD

Dr's D M Bibby, N B Milestone, L M Parker and N J Tapp

The 1991 New Zealand Institute of Chemistry Shell Prize for Industrial and Applied Research, has been awarded to Dr's Bibby, Milestone, Parker and Tapp of DSIR Chemistry, for their work on the synthesis and catalytic applications of zeolites.

Zeolites are unusual microporous compounds containing alumina and silica. They have ion exchange properties, which lead to applications such as water softening and slow-release fertilizers. They are extensively used as adsorbents, a property which can be applied in gas separations, and as catalysts with wide applications in the petrochemical industry. While zeolites have multiple uses in New Zealand, it is their catalytic applications which are most interesting and unusual. In particular, the Motunui Gas-to-Gasoline process relies on a unique zeolite catalyst which can convert methanol to high octane gasoline.

The winners of the New Zealand Institute of Chemistry Shell Prize began work on these zeolite materials some time before the Mobil Gas-to-Gasoline process was accepted by the NZ Government. They started by synthesizing the ZSM-5 zeolite catalyst, which at that time was not readily available outside Mobil, and characterised its properties. Of particular interest was its ability to produce durene from methanol, an aromatic compound with a number of potential applications in the chemical industry.

One of the characteristics of zeolite catalysts is that, with use, they almost inevitably lose activity. This deactivation is caused either by the formation of coke, which clogs-up the zeolite and blocks access to the catalytic sites, or by the slow destruction of the structure so that the catalytic property of the xeolite changes. While the coke can generally be removed by oxidation so that the catalytic activity recovered, the destruction of the structure causes a permanent loss of activity. The group studied the process leading to coke formation and its removal, and an insight as to where the coke is located, what type of compounds lead to coke formation, and how coke can be removed, has been gained.

From these studies, a great deal of other research developed. Several novel zeolites have been synthesised, their sorption properties for the recovery of organic compounds from aqueous solution have been investigated, new catalytic reations have been discovered which produce highly reactive ketene compounds, computer models of the processes of coke formation have been developed and extensive spectroscopic studies carried out.

The discovery of a new microporous oxide system based on aluminophosphates led to extensive work on these materials. Many more elements can be substituted into the structural frame-work of aluminophosphates than into silicate structures and their uses are only now being established. However, it has already been shown that they have a wide range of catalytic activity and unusual sorption properties.

Within DSIR Chemistry, there has been significant work using NMR with Dr R H Meinhold and on catalytic properties with Dr L P Aldridge (now Australian Nuclear Science and Technology Organisation). Much of the research has extended beyond the division. Work on the thermal decomposition of the ZSM-5 lattice was carried out by Dr J Tallon in DSIR Physical Sciences, and research into the synthesis and properties of aluminophosphates with Professor N Curtis and spectroscopic studies of zeolites with Dr G Burns, carried out at Victoria University of Wellington. Sorption on partially coked zeolites with Dr C Pope, Otago University and deactivation studies with Dr's Howe (now University of New South Wales), McLellan, Wong and Alexander, has been carried out at Auckland University. Cooperative research work with scientists in the USA, Canada, Australia and the UK has published.

Currently the interests of the group cover investigations of catalytic oxidation for the removal of trace organic pollutants from the atmosphere, the synthesis and characterisation of novel silica compounds, which may have uses in separating complex mixtures, and the production of aluminosilicate minerals with fibre-like morphologies.

The Shell Prize was presented at a function in Wellington branch on 18 March. On congratulating the winners Mr Doug Brown, a Director of Shell, stated Shell was pleased to be the sponsor of this prestigious prize and planned to continue their long association.

Dr D M Bibby:

Dr Bibby joined DSIR Chemistry in 1975 with a B.Tech and a PhD in nuclear chemistry from Loughborough University of Technology, UK. Five years in South Africa gave him a background in applied nuclear physics and geochemistry. He worked in New Zealand initially on the use of waste materials, oil shales, and cement chemistry. Work on zeolites began in 1979 with the synthesis of silica analogues of the ZSM-5 zeolite. This continued with extensive on the synthesis of ZSM-5, as well as producing a number of new zeolites. More recently, particular attention has been given to the deactivation of ZSM-5 during methanol conversion. Today he is a Research Group Manager in DSIR Chemistry.

Dr N B Milestone:

Dr Milestone the DSIR in 1964 as a bursar, obtaining an MSc from Victoria University of Wellington and a PhD in soil chemistry from Waikato University. At DSIR Chemistry he joined the Cement and Concrete section in 1972 and worked on cement chemistry, an area where he now holds an international reputation. His work on zeolites, began in 1979 on the synthesis of silica analogues of zeolites and extended to the synthesis, characterisation and applications of aluminium phosphate analogues of zeolites. Recently, he has returned to the study of cements, specifically for geothermal applications. Currently he is Section Leader of the Inorganic Materials group.

Dr L M Parker:

Dr Parker joined DSIR Chemistry in 1981 with an MSc from the University of Canterbury and worked on the synthesis of novel zeolites. The work extended to doctoral studies on the spectroscopies properties of molecules sorbed on zeolites and catalysis over non-acid zeolites, which she obtained from the Victoria University of Wellington in 1989. Currently she is working on unusual layer compounds with anion exchange properties and the preparation and use of oxidation catalysts for removal of atmospheric contaminants.

Dr N J Tapp:

Dr Tapp joined DSIR Chemistry in 1984 with a BSc (hons) from Otago University and worked on the synthesis and properties of unusual aluminophosphate analogues of zeolites. This work formed the basis of his doctoral studies, which he obtained in 1988 from the Victoria University in Wellington. After a period seconded to the Haldar-Toepsoe Catalysis Laboratories in Denmark, he moved to Unilever New Zealand Limited in 1989, where he is now Development Manager.

SURVEY - IUPAC SURVEY OF CHEMISTS

The following letter from IUPAC President Allen J. Bard invities chemists to offer their advice and recommendations on projects that might be addressed within IUPAC programmes.

Dear Chemist,

Each year the various commissions and committees of IUPAC undertake many projects. In general, these projects are related to the needs of world chemists and the role of chemistry in meeting the needs of mankind. These often deal with problems of nomenclature, symbols, terminology, and conventions. They also include critically evaluated data compilations, recommended measurement procedures and analytical methods, recommended standards, and guidelines for publication.

Although the various bodies of IUPAC contain chemists who are very knowledgeable in their specialities, it is clearly not possible to cover the full breadth of chemistry within the limited membership of the Union. Thus there may be important problems and projects suitable for IUPAC study that are not undertaken in a timely manner. We are therefore soliciting the chemistry community through chemistry journals and magazines for advice and recommendations on projects that might be addressed within IUPAC programmes. If you know of such projects, please complete the brief form below and send it to the IUPAC Secretariat for consideration by the appropriate IUPAC body.

Thank you for your advice and interest. Please send any responses to:- Dr Michael Freemantle, IUPAC Secretariat, Bank Court Chambers, 2-3 Pound Way, Templars Square, Cowley, Oxford OX4 3YF, UK, with a suggested project title and a brief description of nature of problem together with suggested experts (names and addresses) in this area.

LETTERS TO THE EDITOR

Dear Sir

I have recently come across your article in Chemistry in New Zealand 'Fats: A Neglected Chapter in Nutrition' which I enjoyed reading very much. I could not agree with your sentiments regarding lipid illiteracy more! I am a little confused about the last paragraph however. I was unaware that NZ pastures (or any other for that matter) are rich in alpha linolenic acid.

P.C. Calder, Department of Biochemistry, Oxford University.

Dear Professor Shorland

I have just received by surface mail the issue which contains your 1990 Mellor Lecture to the Wellington Branch of the N.Z.I.C.

I bought my copy of Mellor's Modern Inorganic Chemistry when I was in High School and I have carried it with me ever since. I would be most interested to know of further sources of information about this great man in his native New Zealand, I would like as a first step to learn more about him. I hope all is well with you and I congratulate you on your address as Mellor Lecturer.

Sincerely Philip W. Le Quesne

Interim Vice Provost for Research and Graduate Education. Professor of Chemistry and Medicinal Chemistry. North Eastern University Boston, Massachusetts 02115

Dear Sir

In New Zealand we seem not to be sufficiently aware of our distinguished graduates. Who has ever heard of Clara Taylor (1885-1940) a first class honours graduate in chemistry under Easterfield in 1905. Whereas in Chemistry in Britain February 1991 devotes 2 pages to her distinguished career, mainly as a teacher, I don't recall her being mentioned in any New Zealand journal.

F B Shorland (19.2.92)

Dear Sir

My thanks to Keith Hunter for his reply to my letter regarding the effects of the so-called runaway greenhouse effect. I agree that the density of sea water is dominated by dissolved salt and I appreciate Keith pointing this out. But I do not agree with his idea that a 1 to 5 degree temperature increase will melt polar ice. First, because the North polar ice mass is freely floating, Archimedes' principle says that melting this will have no effect on ocean levels. This is not the situation at the South polar region.

Second, I understand that things do not melt until they are at their melting point. In the case of water, this is of course 0 degrees C. I also understand that the polar regions are well below 0 degrees C. Thus a 1 to 5 degree temperature increase will not melt any ice. A case of confusion between intensive and extensive effects perhaps?

I must direct Keith Hunter and your readers to the excellent book by John L Daly of Launceston College, Tasmania; "The Greenhouse Trap - Why the Greenhouse Effect will NOT end life on Earth; Bantam 1990. On page 84, John Daly explains the Simpson Effect and I quote the summary on page 91. "... a global warming could itself trigger an Ice Age by driving the Polar Front and its rain-bearing depressions into very high latitudes, where heavy snow would result." I will also quote Bob Kirk of Canterbury University, radio interview 1989; "It's possible to argue that if we heat up the atmosphere we put more moisture into it, so we could increase the precipitation at high latitudes thereby leading to ice buildup." I was concerned only with the thermal expansion of water as a consequence of a run-away greenhouse effect. Keith Hunter has stated that the oceans are at a temperature of nearly 2 degrees which fits in with my original claim that thermal expansion is unlikely to be a threat following a small temperature increase. John Daly in his book on page 98, points out that the climatic warming of half a degree C during the earlier part of this century (1880 to 1940) resulted in the mean sea level rising 11 centimetres. This is close to the amounts I calculated. This issue is important as public concern has reached the stage whereby political action is being planned. Action which will affect our standard of living as Rob Whitney has pointed out.

Yours sincerely,
Roger D Keen

PUBLIC AFFAIRS

NATIONAL COMMITTEE TO OVERSEE SCIENCE QUALIFICATIONS

A steering group which seeks to oversee the provision of science qualifications in New Zealand met for the first time in Wellington on March.

This National Coordinating Committee is being set up as a partnership between the science "industry" and education and training providers.

"The Committee is seeking to be recognised by the New Zealand Qualifications Authority as the National Standards Body for science qualifications", said spokesperson Dr Martin Grinsted, Head of the School of Science at the Central Institute of Technology, Upper Hutt.

"Defining science for the purpose of establishing an industry-driven training organisation is difficult", said Dr Grinsted. "It involved, for example, primary and secondary producers, manufacturers, central and local government, health boards and research organisations."

Science education and training providers include polytechnics, colleges of education, universities, schools, and private organisations. Dr Grinsted said "...while the Committee would take an interest across the complete range of science education, it did not expect to be involved with advanced programmes taught in Universities, and would have only limited involvement with science in the senior secondary school."

The 11 person steering group included members from a wide range of industries and training providers. However, the membership of the Committee will be not finalised until more extensive consultations have been completed.

FOR FURTHER INFORMATION:

Dr M J Grinsted,
Head, School of Science
Central Institute of Technology,
Private Bag, Trentham.
Ph: 04-527-6355 (bus) 04-528-5433 (a/hrs)
Fax: 04-527-6356.

SCIENCE POLICY AND PUBLIC AFFAIRS COMMITTEE LONG TERM SCIENCE PRIORITIES

Response to opportunity for comment

As the discipline of Chemistry contributes to most of the forty output classes listed for funding purposes, the New Zealand Institute of Chemistry cannot usefully contribute to individual output reviews - in the format requested and in the time allowed (12 working days).

The New Zealand Institute of Chemistry nevertheless wishes to contribute to the current review and hopes that the following recommendations will attract due consideration:

1. Contributing sciences (such as Chemistry) span almost every one of the forty listed output categories, so that their segretation for funding purposes appears impractical and difficult to follow.

2. One (or more) output categories make significant contributions to others; conversely, each output category depends - to a greater or lesser extent - upon work in other categories, so that much of R & D work cannot be viewed from one single category.

3. Proposed output categories 28, 36, 38, 40 in particular form the basic components of every other output group and cannot be isolated. It would be more useful to allocate pro-rata proportions of basic knowledge, training and associated S & T service to each output category.

4. Assessment descriptors need to be rationalised to more effectively accommodate and describe the techniques of the contributing sciences.

The New Zealand Institute of Chemistry is becoming increasingly concerned over the growing complexity of the priority-setting process, which must inevitably distract from achieving useful results within available time, during which more and more ground is being lost.

The Institute reiterates its proposal for a weighted 'points' approach (similar to that being applied for immigration priorities) to ranking R & D priorities in objective and meaningful manner.

The list of desired outcomes (Annex 7) provides a logical starting point for allocating and comparing relative priorities, on a measured basis of outcome benefits.

Such approach would also achieve more effective balance between proposals for immediate commercial gains and those essential for longer-term, wider benefits and the well-being and development of the nation's social and economic prosperity.

Walter Freitag **Professor N F Curtis**
Convenor **Dr G J Leary**
SCIENCE POLICY AND PUBLIC AFFAIRS
COMMITTEE **Dr H Percival**
Mr S Winter

HAZARDOUS SUBSTANCES AND NEW ORGANISMS INFORMATION PAPER

Proposed new legislation which will reform policy and related aspects of the management of hazardous substances and new organisms law is the subject of an information paper which will soon be available for discussion, Environment Minister Rob Storey has announced.

The early announcement of the paper is to forewarn interested parties and provide them with time to prepare responses.

The information paper, which will be available in April this year, will set out the form of the proposed new legislation, the Hazardous Substances and New Organisms Bill, which is expected to be introduced to the House in late 1992.

At present, controls on hazardous substances and new organisms are uncoordinated, being covered by a number of Acts, and administered by several different authorities.

"The present systems for the management of hazardous substances and new organisms are deficient and leave people, property and the environment of New Zealand exposed to unacceptable risks," the Minister said.

"The reform of legislation dealing with hazardous substances and new organisms is a matter of high priority for this Government. Industry, local Government and environmental organisations have already expressed support for this reform," he said.

The proposed legislation will replace the Pesticides Act, the Dangerous Goods Act, Toxic Substances Act, Explosives Act, Animal Remedies Act, as well as parts of other Acts which deal with the management of hazardous substances and new organisms. It will also be coordinated with reforms proposed for other related areas - such as those taking place in Occupational Safety and Health, the Minister said.

Considerable work has already been done in the area, particularly by the Interagency Coordinating Committee on Hazardous Substances (ICC), and a number of decisions have been reached in principle, Mr Storey said. The basis of the proposed legislation will be the core principles established by the Resource Management Act 1991.

It is expected that the proposed legislation will contain principles which:

- assess the risks and benefits of all hazardous substances and new organisms in order to make decisions about appropriate controls;
- provide accountability by setting criteria for decision making and conditions for management;
- provide for public notification of applications, public input into assessments, publication of decisions, and public access to a register of hazardous substances;
- achieve cost effective regulation including the use of economic instruments (e.g. transferable quotas or charges related to risks), and provision for reassessment where appropriate; and
- take account of industry codes of practice for the management of hazardous substances which have been (and are currently being) developed in New Zealand and internationally.

Other expected provisions include the ability to monitor the effects of controls, life-cycle tracking of hazardous substances, compliance with international treaties, and controls at any appropriate point in the life cycle of hazardous substances.

The paper is designed to set out the form of the proposed legislation in a way which will enable interested parties to check its practicality.

In addition to this, the paper will seek comment on the means to implement the monitoring of hazardous substances and new organisms controls, a tracking system for high hazard materials, and the interface between hazardous substances control and waste management.

"Because of the complexity of these matters we want to give all interested parties as much time as possible to consider their input," the Minister said.

*The ICC was established by the Secretary for the Environment in January 1987 in response to widespread concerns about incidents of mismanagement of hazardous substances in New Zealand. It was a nulti-agency committee with broad representation from government, industry, trade unions and professional organisations. Its final report on pollution and hazardous substances management was published in November 1988.

The report pointed out that six Acts of Parliament deal specifically with the

management of hazardous substances, and a further thirty-five Acts contain reference to the control of hazardous substances. In addition, this legislation is administered by a number of Government departments, local authorities and quangos, each with a different approach. Inconsistencies, overlaps and gaps in the management of hazardous substances resulted, the report said. The ICC report saw a need to rationalise the legislation covering hazardous substances activities and new law was recommended.

INTERNATIONAL LINKS IN SCIENCE AND TECHNOLOGY

Response to Discussion Paper by the New Zealand Institute of Chemistry Inc.

INTRODUCTION

The New Zealand Institute of Chemistry is primarily interested in promoting the discipline of Chemistry and its contributions to social, economic and cultural development, at regional, national and international levels.

Our members are engaged in research, teaching (at all levels), and in multifarious applications of chemistry to New Zealand's economy and welfare, in fields such as agriculture, health, manufacturing, law and order and environmental protection. Chemistry is a universal science and in New Zealand is part of the international discipline. It is critical therefore that the small New Zealand Chemistry community maintains strong links with the wider chemical and scientific communities - otherwise, it will rapidly become ineffective.

I. Key Points of Concern

The Institute is mainly concerned with three topics discussed in the report:

1. Scientific Exchange Agreements
2. Membership of International Organisations
3. Effective Government Involvement

1. Scientific Exchange Agreements
(Ref. Questions 6, 16)

The Institute supports exchange agreements which facilitate the exchange of scientists. Exchanges/travel related to particular research outputs are probably best funded through grants from the Public Good Science Fund, as a normal part of research funding, to ensure that all necessary international contacts are available. Hence exchanges under scientific agreements should in general be additional to those supported by output funding, and determined primarily on the scientific merit of application.

The Institute would prefer that such agreements were, as far as possible, coordinated by one agency, with common methods of calling for applications and selecting beneficiaries. It is concerned that exchange agreements should be overly bureaucratic, so that the maximum benefit occurs to science. It considers that the selection process would be most economically and efficiently dealt with by the scientific community, through societies such as ours, or the Royal Society of New Zealand representing the combined scientific societies.

We assume that MoRST will remain existing Science and Technology Agreements with countries like France, Germany, China etc.

2. Membership of International Organisations
(ref. Quest 26)

The Institute is also concerned that New Zealand maintain effective membership of international organisations which coordinate and facilitate international cooperation. In the case of chemistry, this is the International Union for Pure and Applied Chemistry (IUPAC), a constituent of the International Council of Scientific Unions (ICSU). As is the normal situation, the national academy of sciences (in New Zealand represented by the Royal Society of New Zealand) adheres to the Union, and the link in New Zealand is the National Committee for Pure and Applied Chemistry, a standing committee of the Royal Society, whose members are nominated by the Institute of Chemistry. IUPAC is concerned with international standardisation in chemistry (e.g: of units, standard methods, conventions for recording data, etc), and membership ensures that New Zealand has some input into these decisions, which vitally effect research and application of chemistry in New Zealand. IUPAC also licences international conferences in chemistry.

The benefits of IUPAC membership accrue to the whole community, particularly to organisations involved in research, or manufacture in chemistry, and to the much more diverse organisational users of chemical products, or services such as chemical analysis in its various forms. The benefits to individuals are less tangible, and much more widespread than the membership of the Institute of Chemistry, or the Royal Society. It is therefore appropriate that the government, representing the whole community, should be responsible for the costs of this membership. Membership is normally by an appropriate non-governmental organisation, and in New Zealand the Royal Society remains the obvious adhering body.

The New Zealand Institute of Chemistry therefore strongly supports the view that the present position should be maintained, with the membership of IUPAC by the Royal Society supported by the government. Similar arguments apply to the other Unions of ICSU where the science has relevance in New Zealand and to bodies such as CSC (Commonwealth Science Council) and RIKEN (Japan).

3. Government Involvement
(ref. Questions 1, 6, 12)

Whilst appropriate agency-to-agency links should be maintained by the Crown Research Institutes, Industry Bodies and Universities, the New Zealand Institute of Chemistry sees it essential that these are supported by strong, active Government-to-Government links, in order for New Zealand to retain international scientific credibility and recognition as a developed nation.

Countries on which New Zealand increasingly depends for its trade and economic development, (eg: Japan), view government involvement in Science and Technology collaboration as almost mandatory. They expect governments to show active interest in science and see government support as a key indicator of the standing of its scientists and the commitment being made to collaborate.

The Institute therefore recommends that the status of Crown Research Institutes as Government Agencies should be emphasized and that in addition, government-to-government links be co-ordinated by the Royal Society, liaising as necessary with MoRST, MERT and other relevant Ministries.

II Summary of Recommendations

International Links in Science and Technology

Recognising the scenario described in the Introduction and confirmed elsewhere, the New Zealand Institute of Chemistry urges Government to:-

1. Demonstrate full commitment to the importance of Science and Technology and its contributions to the national and international communities. (Ref. Questions 3)

2. Accord similar (bi-partisan) standing to Science and Technology as to other major fields of international co-operation (Agriculture, Trade, Health etc) - as represented by their representative Ministers on the world platform, co-ordinated through the major institution (Royal Society/MoRST). (Ref. Question 3)

3. Maintain and develop New Zealand's international links in Science and Technology, ensuring that such links:

- preserve and enhance New Zealand's international reputation
- operate at top levels, to promote authority, standing and credibility, through direct contacts with competent, peer institutions/persons
- are effectively co-ordinated and identified. (Ref. Question 5)

4. Play the leading role in promoting and supporting contacts among and between all sectors involved (ie: Government, institution, industry, practitioner). (Ref. Question 12)

5. Provide core funding for establishing and maintaining infra-structures for effective liaison and co-operation. (Ref. Questions 5, 13, 30)

6. Contribute appropriate resources to international programmes of strategic importance to New Zealand. (Ref. Question 25)

7. Support membership of international organisations to which New Zealand can usefully contribute - and derive significant benefits. (IUPAC, CSC, RIKEN) (Ref. Question 26)

8. Establish effective, clearly identified contact points for maintaining international links with New Zealand's re-structured Science and Technology organisation, with special emphasis on the status of CRI's as Crown Agencies. (Ref. Questions 12, 16)

NOMINATIONS FOR FELLOWSHIP OF THE ROYAL SOCIETY OF NEW ZEALAND

Nominations for the 1992 election of the Fellows of the royal Society of New Zealand are due by 15th April 1992. Nominations can be made by any three Fellows, or by authorised officers of member bodies of the RSNZ (e.g., the NZIC). Each member body may nominate as many persons as it thinks fit. Each nomination must be accompanied by 5 copies of the following: a curriculum vitae, a full bibliography, and a statement of up to 500 words (one A4 page) indicating the reasons why a candidate is worthy of election. This latter statement must be supported by one set of up to ten significant relevant publications. Nominators should also identify the candidate's six most important papers. The consent of the candidate must be obtained in writing. Supporting documents written by the candidate are not admissable. Nomination and acceptance

Continued on page 34

BRANCH NEWS

AUCKLAND BRANCH NEWS

BEAUTY OF CHEMISTRY EXTOLLED IN VERSE

Professional Roald Hoffmann, a Nobel prize-winner with an unusual passion for communicating the aesthetic beauty of chemistry, visited the University of Auckland during March.

His scientific discoveries, frequent appearances on television and prolific poetry have earned him celebrity status in the United States.

Born in Poland in 1937, he was one of only three Jewish children in the city of Zloczow to survive the Holocaust. Aged 11 he emigrated with his family to New York and began to learn his sixth language, English.

He went to Columbia University and then on to Harvard to do his PhD. For the past 27 years he has taught at Cornell University where his extraordinary teaching ability is legendary.

His research interests are in the electronic structure of stable and unstable molecules, and of transition states in reactions.

Professor Hoffmann was only 28 when his name was immortalised in the woodward-Hoffmann rules. This was regarded as a crucial conceptual advance in theoretical organic chemistry.

At the age of 44 he shared the Nobel Price in chemistry. In 1990 he received the Priestley Medal, the Americal Chemical Society's highest honour.

He hosted 26 half-hour programmes for a television course in introductory chemistry called "The world of chemistry". These screened recently on public television and cable channels. He also writes popular articles on science for the American Scientist and other magazines.

Professor Hoffmann began to write poetry out of a desire to express the sublime beauty of chemistry. He has published two volumes and now has nearly 60 poems to his name.

His verse highlights the connections between chemistry, literature and art. Scientists use words like elegant and beautiful when informally discussing each other's work, he says, yet these are purged in "the ritualistic discourse" of unemotional scientific papers.

He sees scientific criteria as being "not too different" from those applied to poetry or the visual arts. He extols the beauties of symmetry and asymmetry, of simplicity and complexity, and of the relationships among parts of a work.

His schooling in the humanities at Columbia has remained with him ever since and prompts him to speak of 'one culture". This was the title of a very well attended public lecture he gave at the university on Tuesday, March 17.

In the lecture he criticised C.P. Snow's analysis of the rift between scientists and humanists. Using examples from chemistry, poetry, painting and ceramics, he made a case for an underlying unity of science and the arts.

To Professor Hoffmann some degree of scientific literacy is "absolutely necessary" for the population at large in a modern democracy. "People have to make intelligent decisions about all kinds of technological issues."

Democracy occasionally relies unduly on experts over matters such as genetic engineering, nuclear waste disposal or the cost of medical care, he says. "That is fine, but the people must be able to vote intelligently on these issues."

CANTERBURY BRANCH

CHAIRMAN'S REPORT FOR 1991

The Canterbury Branch of the NZIC has once again attempted, sometimes in vain, to entice local members to regular meetings throughout 1991. Each year it seems a struggle to interest members in these functions. The annual barbeque at the University of Canterbury Staff Club was once again the highlight of the years activities (attended by in excess of 100 people). This year we had the added attraction of a fire walk with the assurances of John Campbell of the Physics Department. The staff club features prominently as a venue for a number of other local branch activities during 1991. These included the regular committee meetings, much to the delight of the committee, and also a joint meeting with the Canterbury branch of NZ Institute of Food Science and Technology where Professor Fujino spoke on "Functions and ecology of fatty foods". Other branch meetings during the year included a visit to Feltex Carpets, an educational and entertaining chemical magic show presented by Richard Russell and Bob Schwitzer formerly of Bond University, a job opportunities seminar for chemistry students, the life blood of the institute, and an old favourite, a tour of St Helena Winery.

During June we hosted the President of the NZIC, Dr Harry Percival. Harry gave an address on soil water chemistry to, shall I say, a rather select group of local members. The talk was enjoyed by all but I must say that the evening reflected the current plight of the Institute. Very few younger members were in attendance and it became apparent to me that a number of key issues confronting the Institute are stagnating. We all know that the NZIC fees appear to be high with a large percentage of these fees propping up the magazine costs. Any moves to desk top publishing seem a long way off. The state of the magazine was highlighted by the last issue that publicized the NZIC 60th Jubilee Conference in Christchurch some weeks after its successful completion. The future of the NZIC requires a reduction in the magazine costs and an active program to convince members that the NZIC represents value for money. Many of the older brigade have, I fear, lost touch with the financial plight of most members. We must attract active as well as young members if we are to prosper and I hope that the incoming committee will take this into consideration when it plans the program for 1992. The NZIC must also be seen in the community and I think that the reactivation of CHEM NZ and any other moves in this area can only be a good thing.

The financial position of the Branch remains in a sound position with a balance of $5,666.49 as of October 30th. The principle reasons for this healthy state of affairs remain our low cost of meetings and a rather frugal, and I am sad to say soon to retire, Treasurer.

Finally, I would like to thank the members of the 1991 local committee for their efforts towards the completion of another overall successful year for the Branch. I would particularly like to thank Bryce Williamson for his tireless efforts as Branch Secretary and Council Delegate and also Rob Lake who has held the post of Treasurer for a number of years. Sadly both these members are to retire from the local Branch scene next year. My thanks also go to Margaret Leonard and Peter Ingham for acting as Branch Editors and to Richard Rendle, Jan Gregor, Jan Causer and Jan Wikaira for their contributions throughout the year.

Andrew Abell
Chairperson

The following people were elected or recruited to the 91/92 Canterbury Branch committee:

Chairperson	Andrew Abell
Deputy Chairperson	Jan Gregor
Secretary:	Jan Wikaira
Treasurer:	Gillian Worth
Members:	Margaret Leonard
	Joy Causer
	Shane Blincoe
	Paul Kilmartin

MANAWATU BRANCH NEWS

INCOMING BRANCH CHAIRPERSON: DR J SHAW

John Shaw is a chemistry graduate of Massey University, graduating PhD in 1976. His PhD work was the elucidation of the structure of the

toxin of Dothistroma pinii (red pine needle blight), known as dothistromin. The work entailed the use of mass spectrometry, and John has worked in the field of mass spectrometry ever since. Following his PhD, John went to the US where he worked with Dr Hank Fails at the National Institutes of Health, Bethesda, Maryland (USA) on biomedical aspects of mass spectrometry. He returned to NZ to work in the then Applied Biochemistry Division of DSIR, looking at flavour compounds in meat and fruits. Since that time John has risen through the DSIR ranks to his present position of group manager in the Fruit and Trees division. Throughout his career, John has kept a strong interest in mass spectrometry and supported the mass spec specialist group within the Institute.

Outgoing committee:

Outgoing Local Branch committee members Julian Lee, Roger Haslemore, and Roger Cresswell (Student Rep) are due a special vote of thanks for service to the Branch. Julian was a branch committee member for 11 years, 3 as branch treasurer, and Chairman in 1988. Roger Haslemore was a committee members for two years.

BRANCH NEWS CONTINUED

MANAWATU BRANCH NEWS

Congratulations to Dr Geoff Page, Director of the NZ Dairy Research Institute on being appointed as chief executive officer of the new Industrial Crown Research Institute. At the time of writing Geoff's successor at NZDRI is now known.

Douglas Hay, senior lecturer and course coordinator for the postgraduate Diploma in Occupational Safety and Health at Massey University, has been appointed Chief Technical Advisor to the ILO in China. His job is to coordinate the establishment of a National Safety Training Centre in China, The Centre will provide a national focus for safety and occupational health training with a potential target audience of 130 million workers. The project will last till 1994 during which time a fully equipped operational centre with laboratories, television studios, conference and teaching facilities will be developed.

The first Branch meeting for 1992 took the form of a visit to the Brewery at Mangatainoka. About 20 members attended this interesting field trip, which was followed by product testing. Many thanks to Peter Halliwell from the brewery and to Roger Haslemore for organising the visit.

Mark Patchett, ex Waikato Branch, has recently completed a PostDoc with Dr Peter Leadley, at the Cambridge Biochemistry Dept, on vitamin B12 dependent enzymes. He has now returned to NZ to take up a lecturer's position in Biochemistry at Massey University.

Ted Baker is off to a meeting of the Inorganic Biochemistry Discussion group of Biochemical Society, in Edinburgh in April.

Lawrie Creamer is in Europe for an International Dairy Federation conference on cheese ripening at which he will present a plenary paper and chair a session. He will also visit laboratories in Denmark, Holland and France.

Dr Gavin Hedwig (Massey University Chemistry Dept.) is back in Bergen, Norway continuing his joint study on microcalorimetry of solution of small peptides.

CONFERENCES

RACI NINTH NATIONAL CONVENTION MONASH UNIVERSITY IMPORTANT ANNOUNCEMENT

Due to unexpected circumstances over which we have no control, it has become necessary to change the dates of the Ninth National Convention. The Convention will now be helf during the week Sunday December 6th to Friday December 11th, 1992. This change of date will enable us to provide adequate accommodation in the Monash Halls of Residence for the large number of participants expected at 9NC. I may also make it easier for our colleagues from New Zealand term time. The 9NC Organizing Committee apologizes for any inconvenience this date change causes. We do not expect it to have a significant effect on the planned programme which is summarized below.

Registration will start on Sunday December 6th and the registration area will be the student union. The convention mixer will be held on the Sunday evening and will be sponsored by the RACI Victorian Branch. The opening ceremony on the morning of Monday December 7th will be held in the Robert Blackwood Hall; it is hoped that it will be attended by the presidents of the American Chemical Society, the Royal Society of Chemistry, The New Zealand Chemical Society, and the Federation of Asian Chemical Societies. Four convention lectures are planned. These will be presented on Monday December 7th and Wednesday December 9th, with two lectures on each morning. The convention lectures will cover the topics "The Role of Chemistry in the development of Antiviral Drugs" (Professor Eric De Clercq, Rega Institute, Belgium), 'Protecting the Ozone Layer: the Search for Solutions" (Dr. Leo Manzer, Central Research and Development, DuPont, USA), "Targeting Nucleic Acids with Metal Complexes" (Professor Jacqueline Barton, Caltech, USA), and "the Public Awareness of Chemistry" (speaker to be announced).

The convention program will conclude on Friday December 11th with a barbeque followed by a workshop/symposium on Chemistry - Towards 2000".

The extent of divisional participation is likely to be as follows;

Analytical (2 days), Cereal (2 day symposium on "Near IR analysis for Quality Control"), Chemical Education (full), Colloid and Surface Science (full), Electrochemistry (2 day symposium on "Instrumental Methods and Corrosion Research"), Inorganic (full), Medicinal and Agricultural Chemistry (full), Organic (full), Physical (2 days), Polymer (2 day symposium on "Polymer Blends), Solid State (full), Archives and History Group (1 day), Women in Chemistry Group (0.5 day), Young Chemists (0.5 day).

A national convention provides an ideal opportunity for divisions to interact and to exchange ideas in areas of common interest. Some joint symposia are being organized, and two will cover "New Materials" (Inorganic and Solid State) and "Pharmaceuticals" (Organic and Med. & Agr). We strongly encourage continued consideration of possible joint symposia topics.

An exhibition of laboratory equipment and products plus reference books will run throughout the duration of the convention. Any company interested in participating in the exhibition should write for a prospectus.

Ron S Dickinson
Chairman, Organizing Committee

$EuAsC_2S$

Second Announcement
3rd EurAsia Conference on Chemical Sciences
Bangkok, Thailand
December 14-18, 1992

AIM OF THE CONFERENCE

The Eurasia Conferences on Chemistry, held in Bangkok and Seoul in 1988 and 1990, have been organised to bring scientists from the Supercontinent of Eurasia together for an improvement of mutual relations as well as an enhancement of scientific cooperation in the field of chemical research. The success of this attempt has been culminated by the participation of a large number of distinguished chemists not only from the Supercontinent but also from other continents. At the third Eurasia Conference on Chemical Sciences in Bangkok, the same aim of the conference will be honored and carried through. Special effort will be made to allow also university students of the region to participate.

INVITED LECTURERS

The following distinguished scientists have accepted up to now to be invited speakers of the conference.

Plenary Lecturers:

J D Birchall,	UK
H B Gray,	USA
S J Lippard,	USA
R Noyori,	Japan

Session Lecturers:

J Barthel,	Germany
G Balavoine,	France
M Graziani,	Italy
K Heinzinger,	Germany
D Jagner,	Sweden
K H Khoo,	Brunei Darussalam
J G Leigh,	UK
F Netzer,	Austria
C J O'Connor,	New Zealand
D N Reinhoudt,	The Netherlands
B Setiaji,	Indonesia
N Yordanov,	Bulgaria
You Xiao-Zeng, China	

CORRESPONDENCE

All correspondence should be addressed to:
Assoc. Prof. Dr Sirirat Kokpol
Secretary, EuAsC2S-1992
Dept. of Chemistry, Chulalongkorn University
Bangkok 10330, THAILAND

PRODUCT NEWS

New from Perkin Elmer

A NEW LOW-COST AUTOMATED ATOMIC ABSORPTION SPECTROMETER

The new, fully automated Model 3300 Atomic Absorption (AA) Spectrometer from Perkin-Elmer combines top-of-the-line AA performance with operational simplicity, reliability, flexibility, and cost effectiveness. Quality analytical results are provided by the Perkin-Elmer dual-option burner and high-dispersion double-beam optical system that have a proven performance record in thousands of laboratories worldwide. An IBM compatible computer using a state-of-the- art graphical interface provides complete system control of the AA 3300 and all accessories. Continuum source background correction is standard equipment.

Perkin Elmer AA Laboratory Software (PEAALABS) for the Model 3300 provides the flexibility required by today's laboratories, including method storage on disk and automatic data storage for archival or additional data processing. Report generation capabilities include the ability to create post-run reports in virtually any format. Extensive quality control features are built in to support many regulatory standards, including the Contract Laboratory Program of the U.S. Environmental Protection Agency.

A mouse pointer provides the analyst with "point and click" operational simplicity; the instrument will automatically set the lamp, adjust the wavelength and slit width, and recall the element file. The software guides the user through setup with helpful prompts or dialogue boxes. The gas box is computer controlled to ensure ease of use, maximum reproducibility of the gas flows and complete safety.

A complete line of optional accessories is available for further expansion of the Model 3300's capabilities. The system is compatible with Perkin-Elmer's FIAS-200 Flow Injection System for AA, the MHS-10 Mercury/hydride System, the HGA-600 Graphite Furnace and AS-60 Furnace Autosamplers, the AS-90 Flame Autosampler, and a wide variety of other Perkin-Elmer AA accessories.

THE PE 2410 SERIES II NITROGEN ANALYZER

The new PE 2410 Series II Analyzer allows for the rapid measurement of nitrogen and/or protein, based on an advanced combustion method. An integral 60-position Autosampler allows for unattended operation. Applications include: feeds, grains, cereals, fertilizers, soils, agricultural and dairy products, fish, fruits, meats and related materials.

The PE 2410 Series II employs carbon dioxide as the carrier gas, which is an economic alternative to the conventional helium gas. Automatic gas servers and copper reagent reduction features also contribute to the economy of the analyzer.

The microprocessor controlled PE 2410 Series II has extensive diagnostics and economy features built in as standard. Unique Wake-Up, Shutdown and Auto Start features are also standard. The PE 2410 Series II meets the requirements specified by AOAC Method 990.03. Built-in calculations include protein determinations and calculations at user-specified moisture content.

NEW SOFTWARE FOR PERKIN-ELMER 1600 SERIES FT-IR SPECTROMETERS

SEARCH software is now available for the Perkin-Elmer 1600 Series FT-IR Spectrometers. This software is standard on the Model 1650, available as an option on other models, and may be retrofitted onto existing models in the 1600 range.

The spectroscopist can SEARCH using a number of different algorithms including EXPERT, which interprets the spectrum, Euclidian distance, which uses the entire spectrum, and peak spectroscopist to interpret spectra, identify mixtures and distinguish between very similar compounds. The SEARCH libraries, which can be bought or user-generated, are stored as either sprectra or peak tables.

SEARCH software complements QUANT software for curve-fit quantitative analysis, COMPARE for quality control applications and Calculator for advanced spectral processing.

FOR FURTHER INFORMATION:

Perkin Elmer
New Zealand. PO Box 22-159
Phone: 0-9 276 2230
Fax: 09 276 5602

New from Levingston Bros. Ltd

LOW COST PUMP ALTERNATIVE

A low cost alternative to electric pumps for emptying drums and other small containers is now available from Levingston Bros Ltd. Pumpmaster is a range of portable pumps for transferring liquids of all kinds out of their original containers without spillages or overflows, and makes decanting intrinsically safer.

This is achieved by a design feature which enables a Pumpmaster pump to be connected to any container with an air- tight seal, with virtually any size neck opening. An internal spring relief valve protects against excess pressure building up in the container.

Three different seals are available, made from neoprene, buna nitrile and viton; and the three pump bodies are different colours to clearly identify their applications.

Pumpmaster has proved its effectiveness in applications as diverse as pumping agricultural chemicals and decanting wines.

Levingston sales rep George Turner with the green Pumpmaster model for non-food liquids and special applications.

FOR FURTHER INFORMATION:

Steve Helg
Phone: 0-9 579 2714

New from Alpha Laval NZ Ltd

RAPID PRODUCT IDENTIFICATION

Bran + Luebbe announce the introduction of the InfraProver, the first dedicated Near Infrared Analyzer to use Fourier Transform Interferometry. The InfraProver, designed specifically for the pharmaceutical and chemical industries, can check the identity of raw materials in seconds.

Unique "crystal optics" utilize the change in refractive index of light as it passes through crystal wedges. This unique approach completely eliminates the need for moving mirrors, making the InfraProver much less sensitive to vibration, humidity and temperature than conventional FTIR systems.

The InfraProver is equipped with a hardened fibre optic sample probe enabling the instrument to be brought to the sample. This feature together with the instrument's rugged, compact construction make the InfraProver ideally suited for measure-in-place testing where operators in the warehouse can perform identity testing of samples directly from their containers without any sample preparation. In addition, the quality of in-process mixtures and final product can also be checked to guarantee the highest level of quality in your products.

Identity is determined by sophisticated mathematical algorithms such as Principle Component Factor Analysis and Malahanobis Distance Calculation. In addition, a specialised mathematical treatment, Cluster Analysis, has been developed to separate very similar materials like starches, celluloses, stearates, and polymers with different chain length.

This approach ensures reliable identification and enables dynamic updating for new samples.

FOR FUTHER INFORMATION:

Alfa-Laval (NZ) Ltd
307 Sandwich Rd, Hamilton
Phone: 0-7 849 6020
Fax: 0-7 849 6660

New from ICI Instruments

MULTISOLVENT DELIVERY SYSTEM WITH OPTIONAL COLUMN OVEN

ICI Instruments is proud to announce the release of their new Multisolvent Delivery System, which consists of the model LC1150 multisolvent HPLC pump and LC1440 Organiser module, with optional column oven.

The LC1150 can be used to deliver isocratic solvent compositions, or it can be programmed to run gradient methods, using up to four solvents.

Innovative engineering has resulted in the design of a pumping system that employs a variable stroke mechanism and totally eliminates the use of cams. The floating piston design and the use of only two check valves further enhances the reliability of this pump. The electronics incorporate dual microprocessors that are used to control simultaneously the sophisticated solvent delivery system, monitor the pump status, and receive input from the user interface.

The LC1150 is capable of delivering any solvent composition with an accuracy of +/ - 1.0% of the flow setting and with a precision of +/- 0.1%.

The LC1440 can hold up to four solvent reservoirs with independent helium sparging for each solvent. Special sparge caps are designed for minimal helium consumption. This module can include a column oven that operates at temperatures up to 60°C above ambient.

LC1210 PROGRAMMABLE UV-VIS DETECTOR

The ICI Instruments' LC1210 is a fully featured time programmable dual wavelength UV-VIS absorbance detector. it operates both single and dual wavelength modes in the UV and Visible ranges. The LC1210 offers spectral scanning, a spectral development file for method development, multiple file storage, a queue feature for method file chaining and much more.

The LC1210 uses a deuterium lamp for the 190 nm to 380 nm range and a tungsten lamp for the 366 nm to 700 nm range. The lamp arrangement provides consistent light intensity across the 190-700 nm range.

A microprocessor driven monochromator controls a holographic concave grating for wavelength selection.

Spectral scans can be performed without stopping solvent flow due to the high speed of scanning. Up to ten scans can be stored in the LC1210's non-volatile memory for later replay. Spectral replay can be via the LC1210 LCD display or via the analog output.

The LC1210 has bandwidth of 6nm, wavelength accuracy of +/- 1.0 nm, automatic and remote start and stop and a IEEE 488.2 communication bus.

FOR FURTHER INFORMATION:

ICI Instruments
5 Lake Drive, Redwood Gardens Estate
Dingley, AUSTRALIA, 3172
Phone: (613) 552 4555
Fax: (613) 551 7444

New from Watson Victor

THE ONLY BALANCE/SCALE MANUFACTURE WITH ISO 9001 CERTIFICATE

ISO 9001 is a landmark in the history of Mettler Toledo. In the course of the last 18 months, Mettler Toledo AG in Greifensee, Switzerland has proved that it has a quality system meeting these international standards. All activities in the areas of Marketing/Sales, development, purchasing, production, quality assurance, warehousing, customer service and training were investigated.

The SQS certificate ISO 9001/EN 29001 is internationally recognised. It will strengthen the confidence in Mettler Toledo and its products, especially as the importance of an internationally harmonised quality system has been growing steadily since the introduction of the ISO standard in 1987.

Mettler Toledo (Albstadt) GmbH in Germany already possesses an ISO 9001 certificate awarded by the German Society for the Certificate of Quality Assurance Systems mbH, Berlin (DQS).

Mettler-Toledo's QA system is based on the "Principle of Personal Responsibility". It is only through the committed co-operation of all participants that errors can be systematically weeded out, quality constantly improved and hence Metter-Toledo's leading market position expanded further.

APPLICATION-ORIENTED PROBLEM SOLVING:

METTLER-TOLEDO reinforces one of the strong points of the AM/PM balances.

Accurate weighing continues to be one of the most important and widespread methods of measurement in the lab. But interest is seldom centered on just absolute, bare measured values; rather, these form the basis for further calculations or computer-assisted operational sequences.

The data interfaces of the METTLER AM/PM balances are the gateway to system solutions. But this by itself is only half the battle: thus METTLER does not simply leave the customer to solve his application problems alone. On the contrary: METTLER offers not only balances and peripherals that match application requirements, but also appropriate sofware solutions which allow rationalization of routine operations in the lab and productionl.

In addition to built-in applications such as piece counting, percent or ± weighing, METTLER has developed application software for the AM/PM balances on various levels of convenience to match the specific needs of the customer.

Net total weighing and formula weighing, for example, can be performed simply and solely with the NetEasy-M software package. On a higher level, the METTLER Pacs (sofware and keypad) are available that offer a wide range of application solutions oriented to practical requirements: for instance, the METTLER LabPac-M for common lab applications such as formula weighing in percent or grams.

You can throw away your book of formulas if you have the METTLER FO3220 Formulation Program: it links your METTLER PM with an MS-DOS computer to form a system which you can use to store up to 100 formulas and manage up to 200 components. And for each component you can define individual weighing-in tolerances. While the system monitors the tolerance limits, you keep track of the formulation and the raw material consumption and generate an easily surveyed record with a printer.

METTLER has also prepared similar, practically oriented solutions for other common lab applications, for statistics, for moisture content determinations, to name but a few. From the simple to the very convenient, matching the customers' requirements.

Mettler-Toledo AG, CH-8606 Greifensee/ Switzerland.

THE MASS COMPARATORS FROM METTLER-TOLEDO

Extremely high-resolution balances for special applications.

The filling of high-cost rare gases, quality controls with regard to the abrasion resistance of automobile tires and also mass comparisons of very high precision weights require a special category of balance: the so-called mass comparators or comparator balances. They are distinguished by exceptionally high resolution and extremely good reproducibility, i.e. a very small standard deviation in repetitive weighings of the same mass. One of the few manufacturers of mass comparators worldwide is the Swiss company of Mettler-Toledo AG.

Mass comparators are needed in all cases where exceptionally exacting demands are made on the weighing results, for example at national metrology institutes, weights and measures departments or blanks and mints. A further operational area is represented by quality assurance in industrial applications, such as in the aerospace and semiconductor industries.

THE NEW METTLER GA45 PRINTER

Weighing and measurement results reliably documented

The successor to the time-tested GA44 is a dot matrix printer for normal paper that is compatible with METTLER balances and instruments. The easily surveyed keypad is self-explanatory and makes operation particularly simple.

Simply when connected to a balance, the new METTLER printer forms a versatile, intelligent, small-scale system:

The sample weight is printed out with the time, date, identification number, run number and balance number. This assures unambiguous identification of the samples and thus meets the GLP standard.

Regular calibration and adjustment can be substantiated each time in black and white. With the GA45, the origin of weighing results in the lab is unambiguously verifiable. These measurement data can also be statistically evaluated: mean, standard deviation, minimum, maximum and difference of the samples can be calculated immediately. Intermediate or subtotals are obtained with a single keystroke. Thanks to a numeric keypad, weight values can be converted into other units.

PARTICLE DETERMINATION PERFORMED SIMPLY AND RAPIDLY

The determination of carbon black particles of engines or fuels, of particles in wastewater, lubricants, oils, etc. or the particle analysis of photocopier toners is usually performed with appropriate filters. Since such determinations involve extremely small quantities, the balances such as the METTLER AT20 which are used must have a correspondingly high resolution.
METTLER has developed a special kit for the AT balances for the weighing of filters (up to max. 105mm diameter). This covers most applications in particle determination. The constant load disk included in the set also allows weighings with the AT201, AT261 and AT200 higher-capacity balances. For weighings of electrostatically charged filters, two special plates are enclosed that shield against electrostatic influences. The entire kit can be mounted simply and quickly. A few manual operations are all that are needed to reconvert the AT balance to conventional weighing operation.

METTLER PENETRATES THE MICROGRAM RANGE WIT THE ANALYTICAL BALANCES OF THE AT SERIES:

2 µg readability over fully 22 grams

There appears at present to be no limits to the relation between readablility and weighing range. Wioth the new, fully electronic AT20 Analytical Balance, METTLER has once again erected a milestone for highly precise weighing: the readability of this balance is 2 µg throughout the entire weighing range of 22 g.
The AT20 is used in all cases where comparatively heavy tare vessels are employed and extremely exacting demands are made on the readability. appropriate applications are found, for instance, in CHN analysis with absorption tubes (tare weight of the tubes >10 g), in liquid chromatography, where the samples are weighed directly into the vessel with a tare weight of around 10 g, in ecological analysis with soil samples of a few 100 mg in platinum boats of up to 9 g tare weight, or in microtitration in which samples of a few mg up to 2g are weighed into 2.5 and 10ml volumetric flasks with a tare weight up to 10g.

Simple operation

Operation of the METTLER AT20 is identical to that of the other balances of the AT series. The weighing result is shown directly on the clear LCD. The automatic draft shield simplifies and at the same time accelerates the weighing-in. This reduces the number of operating steps from the usual nine to just five and increases both the weighing rate and the quality of the weighings.

Automatic calibration thanks to METTLER FACT

As with all analytical balances of the METTLER AT series, the new AT20 is equipped with the METTLER FACT (Fully Automatic Calibration Technology), which calibrates the balance automatically. As soon as the sensors in the balance detect changes in the surroundings which would lead to violation fo the admissible upper or lower tolerance limit, the balance automatically starts the calibration procedure. Here, the AT determines whether work is currently being performed on the balance and if this is the case waits for a break in operations before proceeding. The user is thus assured at al times of working with an analytical balance calibrated to match the latest conditions.

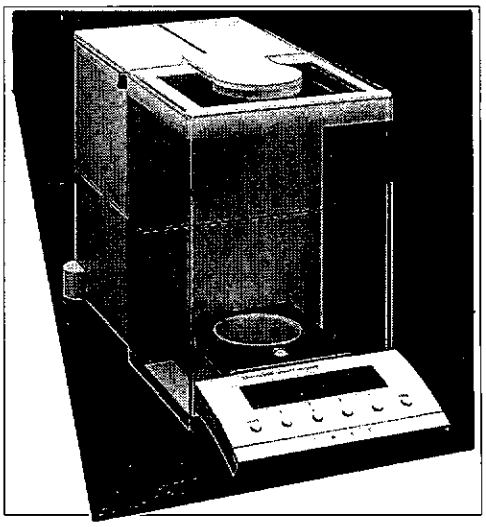
FOR FURTHER INFORMATION:

Watson Victor Ltd
PO Box 1216
AUCKLAND
Phone: 0-9 579-3039
Fax: 0-9 525-0951

New from Alphatech

DENVER INSTRUMENT COMPANY PROVIDING THE WORLD MARKET WITH PRECISION BALANCES

Analytical Balances, AB and AA Series Top Loading Balances, AC, AL and DE Series Mechanical Balances Infra-Red moisture Balances.
Denver have recently launched their new 5 decimal place series of Analytical Balances, the AB Series. There is a choice of 4 models (one dual range) with capacities up to 300g. These balances are menu driven with a HELP function for easy-to-follow instructions.
Like all Denver Balances the AB Series uses the proven Force-Restorative weighing method, not the less expensive Strain-Gauge design.
all AB balances have statistical functions built-in, to enable calculations of minimum, standard deviation and other values over a selectable number of samples.
The AB Series of balances use a three-point calibration based on zero and two internal standard weights. These balances also re-calibrate if they detect a change of more than 1.5°C.
All results and warning messages are presented on a high resolution LCD display. The AB Series have motorised chamber doors which can be operated at the push of a button or, for literal hands-off



operation, controlled by the footswitch. An RS-232C bidirectional interface is a standard feature allowing results to be outputted to a printer.
In addition Denver offer a full range of Top Loading, Dual Range Balances as well as the AA series of Analytical Balances and the IR-100 Moisture Balance. Mechanical Balances and Calibration Weights are also available.

All Denver balances have a standard 'no nonsense' two year warranty.

FOR FURTHER INFORMATION:

ALPHATECH Systems
Phone: 0-9 377-0392 or 0-4 389-3905

COMPANY NEWS

Perkin Elmer - New Zealand has been appointed exclusive sales and service agent for Suprex Corporation, Pittsburgh USA.
Suprex offers a comprehensive range of supercritical fluid extraction and supercritical fluid chromatography instruments fully supported by a complete range of consumables and supplies, such as columns and extractor vessels.

The instrument range includes:

- PrepMaster SFE System for fast, cost effective supercritical fluid extractions. A perfect replacement for traditional solvent extraction methods. Both static and dynamic systems and collection off-line or on-line with the Perkin Elmer AutoSystem gas chromatograph.
- Model 50M SFE System. A fully automated supercritical fluid extraction system with Multi Vessel flexibility and high throughput. Upgradeable to SFE/SFC System.
- Model MPS/225 SFE/SFC System. The most versatile and powerful Suprex System. Combines supercritical fluid extraction and supercritical fluid chromatography for analysis. The system is full automated and includes cryofocusing.
- Model SFC/200A Integrated SFC System. A powerful and versatile supercritical fluid chromatograph with dedicated microprocessor control. The heart of the system is a pulse-free, high capacity syringe pump capable of delivering mobile phase flow rates of 1 to 10,000 microlitres per minute.

FOR FURTHER INFORMATION:

Perkin Elmer
PO Box 22-159 Otahuhu, AUCKLAND
Phone: 0-9 276 2230
0-9 276 5602

NOMINATIONS

Continued from page 28

forms are available from the Executive Officer, The Royal Society of NZ, P.O. Box 598, Wellington (Ph 04-472-7421; fax 04-473-1841).

An indication of the appropriate advisory panel or panels to consider the candidature should also be provided. These panels are: animal sciences; biochemical, cellular and molecular biological sciences; chemical sciences; earth sciences; engineering and technological sciences; human sciences; mathematical sciences; medical sciences; physical sciences; plant sciences.
Nominations remain valid for five years, and further evidence in support of the nomination may be added yearly.

ERRATUM

In Fats: A Neglected Chapter in Chemistry (Chemistry in New Zealand, Vol 55 (3) 1991, pages 42-44 the Greek letter psi (φ) was wrongly used to designate alpha linolenic acid which should have been printed as (α) - linolenic acid as in Figure 3.

SGS TAKES UP SPONSORSHIP OF THE PREVIOUS ICI PRIZE

SGS New Zealand Limited is pleased to have the opportunity to take up the sponsorship of the prize previously sponsored by ICI New Zealand Limited.
The value of the prize money has been increased to $1,000 to reflect the importance SGS as a company places on contributions to scientific research. As a more permanent reminder to the recipient, a suitable plaque will be presented as part of the prize.

SGS NEW ZEALAND LIMITED

The name SGS New Zealand Limited is probably unfamiliar to most of our readers. The following gives a brief outline of the company in New Zealand and its relationship to SGS International.
SGS New Zealand Limited is part of the world's largest independent inspection and testing company, Societe Generale de Surveillance, based in Geneva, Switzerland. The organisation operates in over 140 countries, has 230 laboratories and employs in excess of 25,000 people.
Societe General de Surveillance was founded in 1878 to represent the interests of buyers and sellers wherever they could not be present personally. Initially, the company specialised in the inspection of agricultural produce but the range of services extended progressively to consumer goods, petroleum and petrochemical products, as well as to the development of financial services, insurance services and activities related to health and the environment.
Societe Generale de Surveillance has had a presence in New Zealand since 1976. SGS New Zealand currently has approximately 800 employees and operates from over 21 locations throught the North and South Island, employing professionals from all scientific disciplines, including chemists, metallurgists, agruculturalists, radiographers, physicists, biologists, quality assurance specialists and those involved in the medical field.

A division has been established for each field of testing to provide the specialisation required to inspect, test or analyse various sample types received.
The divisions include those involved in the testing of wool, gold and minerals, agricultural products, non-destructive metal testing, heat treatment, food and chemicals, petroleum products, export/import certification and pathological services.
The core activities of SGS worldwide are those inspecting and testing agricultural products (Agri Division), petroleum and associated products (Redwood Division), metals (Qualitest) and import/export certification and (Economic Affairs Division). These divisions have been the mainstay of SGS's presence in New Zealand for many years.
In January 1990, SGS New Zealand took an interest in the medical testing field and now has three pathological laboratories in operation (Auckland, Wellington and Christchurch).
The four general laboratories in New Zealand supplying analytical and consulting services to industry, namely Scientific and General Consultants, Chemical Service Laboratories, P J Dawson Laboratories and Pearson Biologicals will be be known collectively as SGS New Zealand Limited - Laboratories Division. They will still trade as separate laboratories within this division.
There are, in addition, two laboratories located at New Plymouth and Marsden Point supplying inspection services to the petrochemical industry.

Sorvall — The force in centrifuges

The outstanding features and advantages of Sorvall Centrifuges add up to unparalleled versatility and enhanced user convenience giving you the edge you need for your research.

Sorvall RC28S

- Performs all superspeed applications plus those that extend to the low end of the Ultracentrifuge range — bridging the gap between super and ultra.
- 20 program memory storage for easy recall of frequently run programs.
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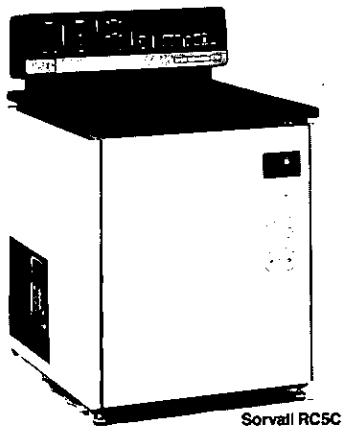
Sorvall RC5C

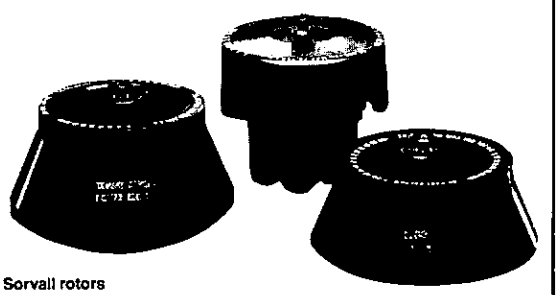
- Automatic compensation for fluctuations in time, speed, and temperature assures run-to-run reproducibility.
- Convenient controls and a large digital LED display showing both set and actual run conditions allows manageable operation.
- The direct drive motor system and high capacity refrigeration system do not require a vacuum to achieve rotor speeds or maintain operating temperatures.

Sorvall Centrifuges are available exclusively in New Zealand from Watson Victor Ltd.



Sorvall RC5C

Sorvall RC28S



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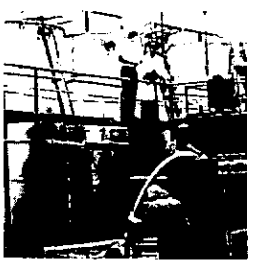
6204A

HAZARDOUS AND LIQUID WASTE MANAGEMENT

Are you satisfied with your company's waste disposal practices?



Managing hazardous waste is an increasingly difficult and complex challenge and is a continuous process of responding with technology to the challenges posed by technology.

In addition to our New Zealand services to manage solid waste, Waste Management NZ Ltd has since 1985 operated a hazardous/liquid waste treatment facility in Manukau City.

Waste Management NZ Ltd is committed to the complex, on-going process of challenge and response necessary to ensure the safe and effective management of hazardous wastes.

Today, our services include:

- Waste removal and transport
- Waste treatment and disposal
- Emergency spillage response
- Sample retrieval and analysis
- Consultancy
- Recycling

If you have a specific waste disposal problem, or an ongoing need for hazardous/liquid wastes treatment and disposal - or if you just wish to know more about us contact:

WASTE MANAGEMENT NZ LTD,
Hazardous/Liquid Wastes, 25 Diversey Lane, Wiri. PO Box 76108. Manukau
PHONE: (09) 278 3644, (09) 278 2433. FAX: (09) 278 1975

WASTE MANAGEMENT NZ LTD,
Box 356, Rotorua. PHONE: (073) 490 222. FAX: (073) 461 659

Waste Management N.Z. Ltd.

FUME MANAGEMENT

BY THERMOPLASTIC

Dedicated to Laboratory Safety

Backed by many years of research and development, all our fumecupboards fully meet New Zealand Safety Standard 7203. Xtracare also meets New Zealand Standard 6101 part 3, and is classified as NON-HAZARDOUS.

THERMOPLASTIC Labrocare

LABROCARE—Added Operator Protection
Available in three sizes:

Model	Height	Width front to back	Length
LAB4	1550mm	760mm	1220mm
LAB5	1550mm	760mm	1525mm
LAB6	1550mm	760mm	1830mm

The Labrocare Fumecupboard has been specifically designed in New Zealand to meet situations which do not call for the advanced performance of the Xtracare. Built to the same internal height of 1550mm it offers the advantage of being able to set up taller laboratory equipment. It has the same slimline columns which both reduce turbulence and give more working space; and the same by-pass system to balance air intake. Fume containment is excellent. A full range of labtraps can be fitted to the ergonomic front beam. Baffles can be easily removed for cleaning and the recessed floor in Fridurit Resistex, Techdek or Stainless Steel looks after spillage. Made of quality materials throughout, Labrocare comes with sealed overhead lighting and doors with armour toughened glass or acrylic as an option.

THERMOPLASTIC Econocare

ECONOCARE II
The ALL-Purpose Fumecupboard...designed in New Zealand by Thermoplastic to meet New Zealand Standard 7203 and specifically for the New Zealand laboratory environment; suitable for positioning on standard 900mm high laboratory bench unit.

Model	Height	Width front to back	Length
ECON4	1220mm	760mm	1220mm
ECON5	1220mm	760mm	1525mm
ECON6	1220mm	760mm	1830mm

The new improved ECONOCARE II is constructed of high quality PVC. It features a single opening inlet. The bypass system and the vertical slimline side columns which reduce internal turbulence combine to provide balanced air velocity. All joints are PVC welded for increased chemical resistance. (After 21 years experience it is Thermoplastic policy to avoid stainless steel sheet or powder-coated aluminium in body construction. Stainless steel is however one of the four options for the work surface, the others being Fridurit, Resistex and Techdek.)
Armour toughened glass doors or acrylic are options. Fume containment is excellent as is the sealed overhead lighting, while the ergonomic front beam can accommodate a full range of laboratory taps as required. Removable baffles make for ease of cleaning.

THERMOPLASTIC Xtracare

Microprocessor control

Designed for greater safety, simplicity and ease of operation, Xtracare meets New Zealand Standard 7203 and 6101 part 3 more comprehensively than any other fumecupboard on the New Zealand market. It is close to the ultimate in safe performance.

Other important features are
Heat resistant FRIDURIT ceramic floor as standard. Completely resistant to practically all chemicals. (Test data available.) Alternative floors in Resistex, Techdek or Stainless Steel. Recessed floors contain spillage.

Patented baffle system for increased fume containment. Baffles easily removed for cleaning.

New design of roof outlet to provide more even air extraction. Full width exhaust outlet.

Condensate trap to prevent condensation in ducting from returning to fumecupboard.

Ergonomically designed base beam for ease of tap operation. Full range of lab taps can be fitted.

Available in three sizes

Model	Height	Front to Back	Length
XTR4	1550mm	760mm	1225mm
XTR5	1550mm	760mm	1525mm
XTR6	1550mm	760mm	1825mm

SPECIAL SIZES MADE TO ORDER

Slimline angled columns to reduce turbulence.

Redesigned armour toughened 2-part glass doors...smooth, quiet...opening to 900mm high...automatic lock reset.

Gas and water services rear-mounted to give a much greater and clearer working surface.

Sealed overtop lighting delivering in excess of 400 lux to the working surface.

Phone or Fax for immediate information about any Thermoplastic product or service.

Thermoplastic Engineering Ltd, produce fumecupboards to handle perchlorates, radio isotopes and a wide range of solvents.
Additionally they produce a special model for schools.
All Thermoplastic fumecupboard models can be made to special sizes as required.

Pacemakers in Plastic Fabrication

Thermoplastic Engineering Ltd.

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