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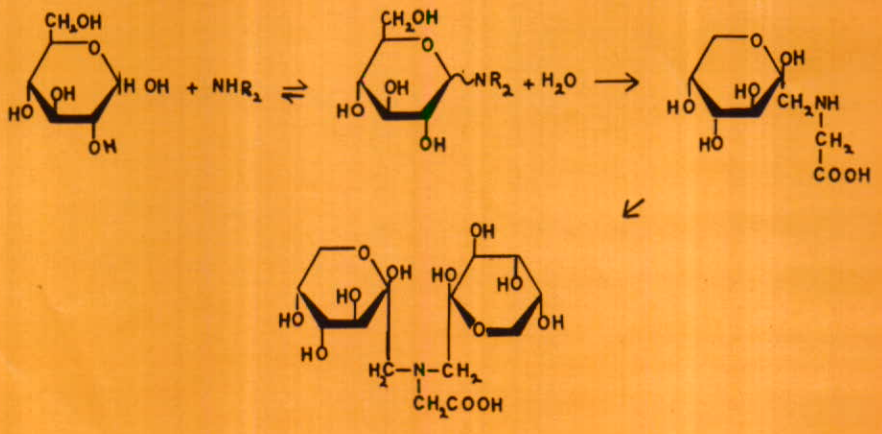

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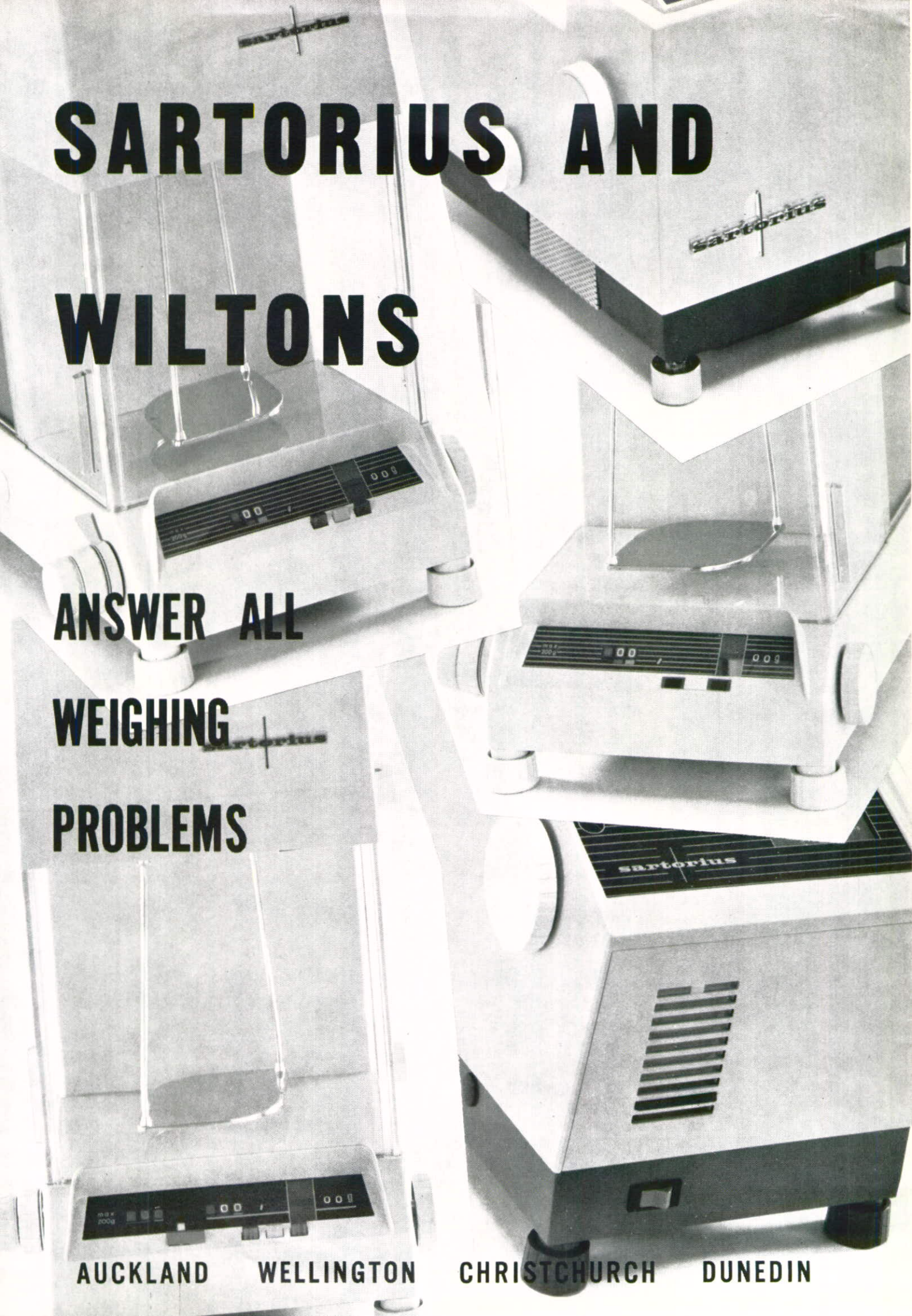

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chemistry in new zealand

Journal of the New Zealand Institute of Chemistry

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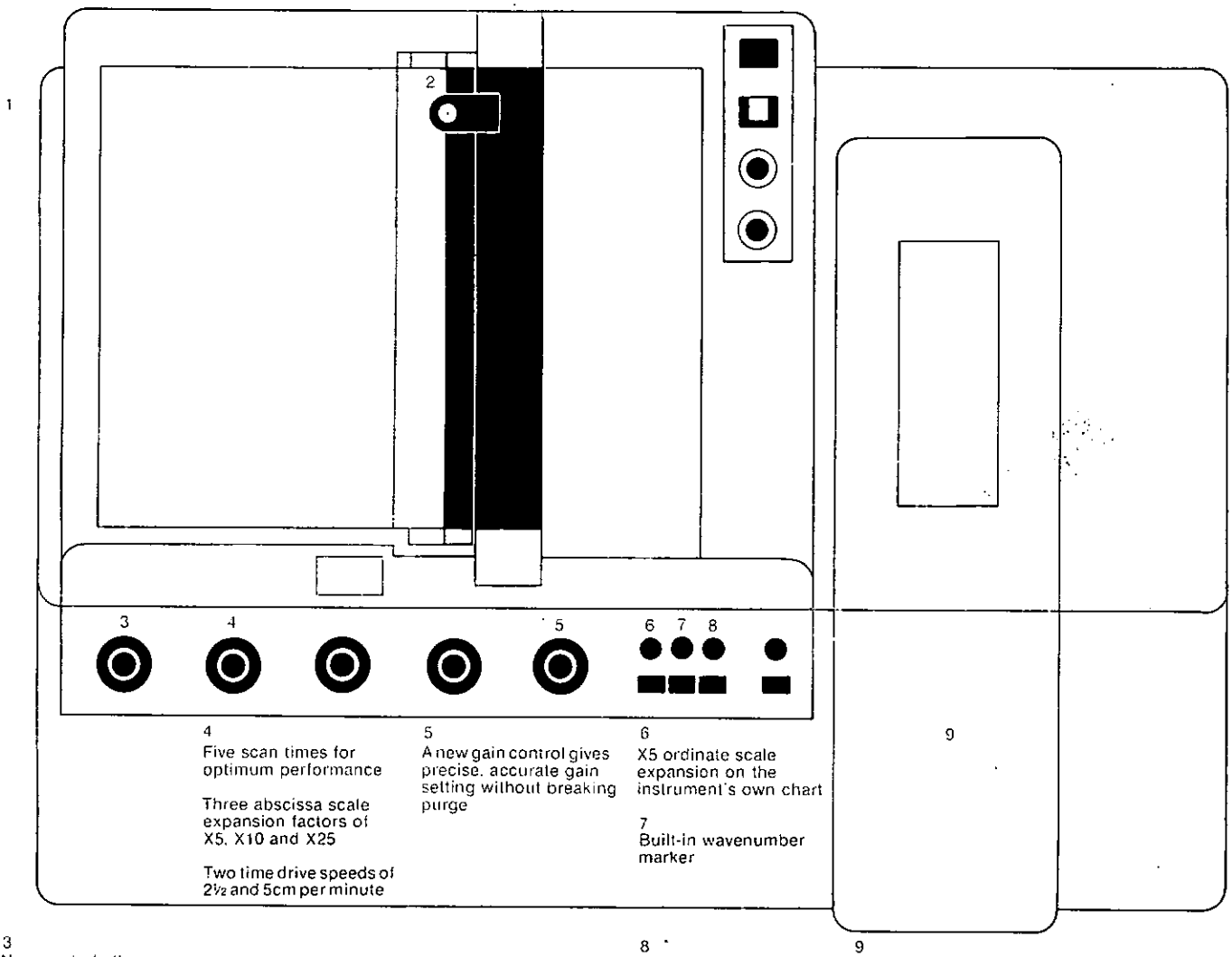

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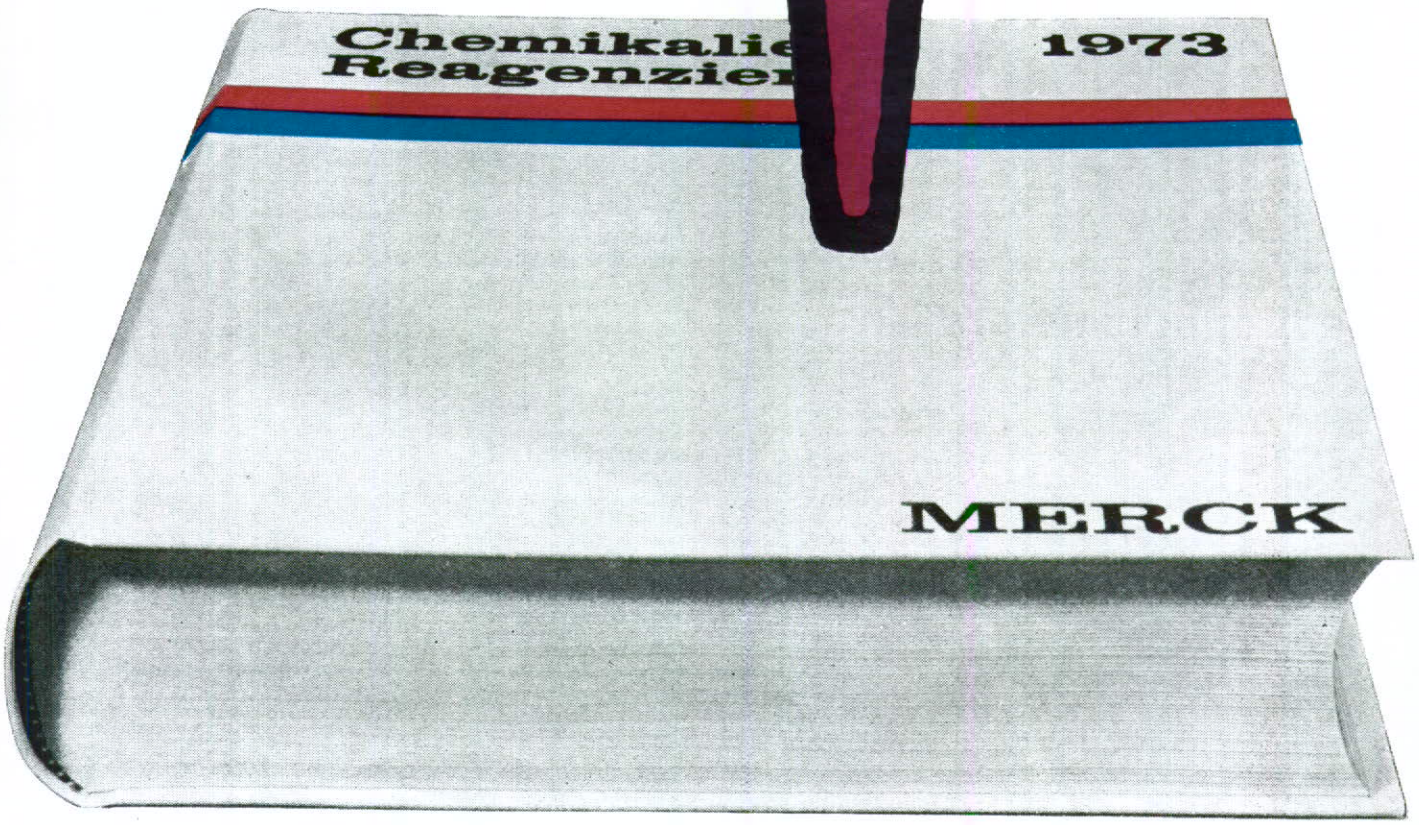

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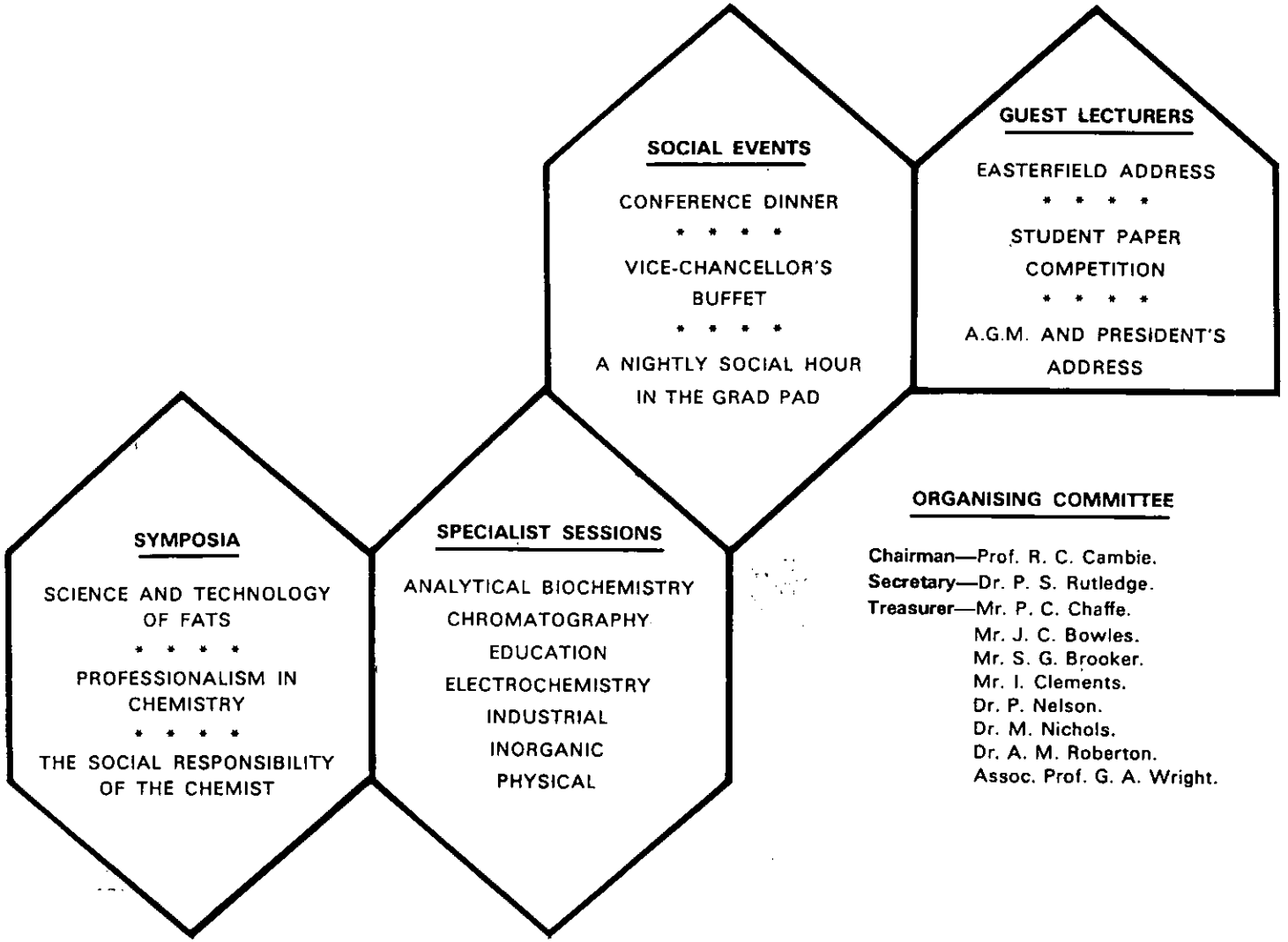

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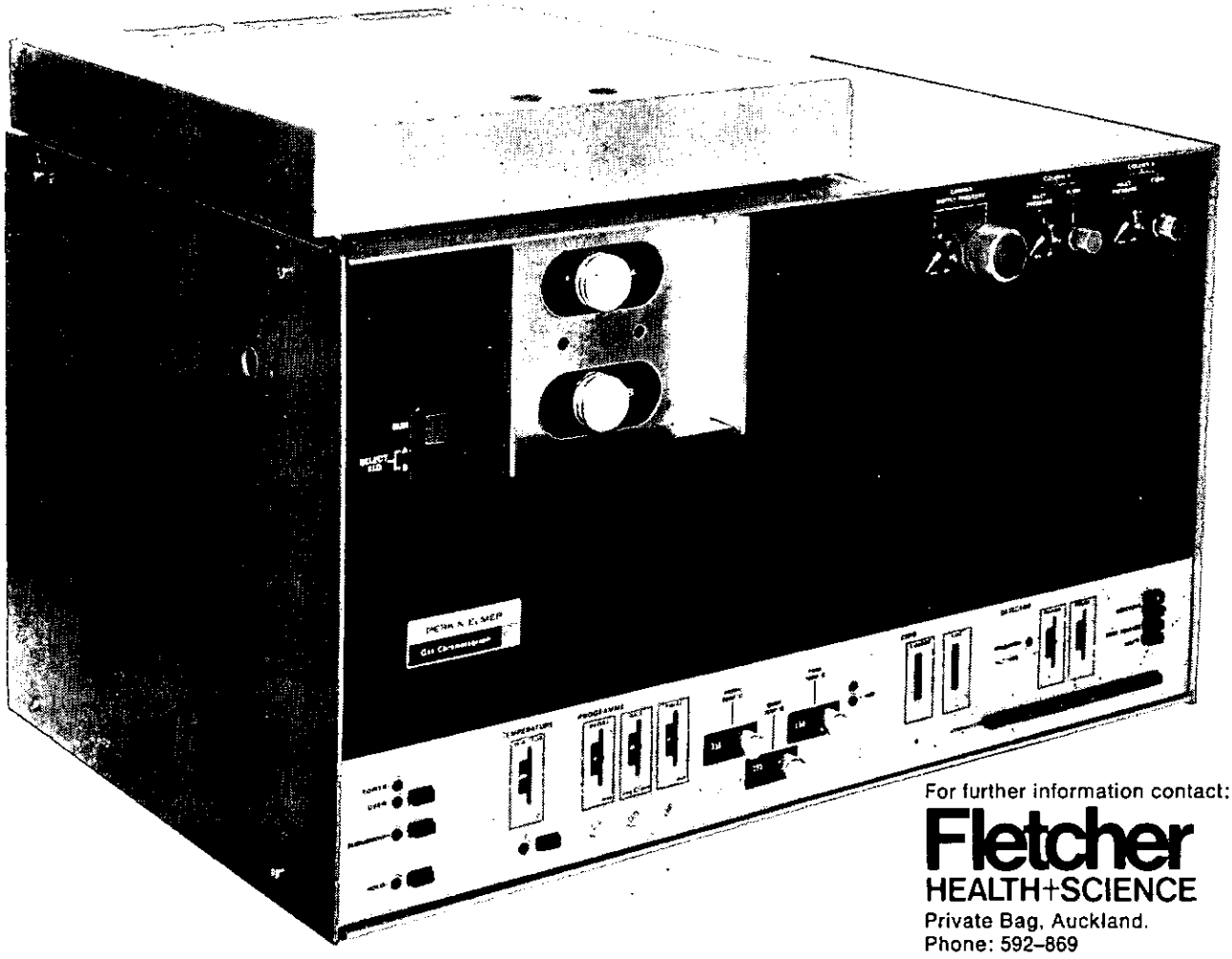

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From the President

Institute Subscriptions

At the meeting in December, Council decided on an increase in subscription for the year 1974-75. The new rates are $14 p.a. for Fellows and Members and $7 for overseas members; Graduate subscriptions are unaltered. Council also accepted the probable need to increase the subscription rates further, the following year, although this is expected to be only marginal. Setting the subscription is the responsibility of Council (Rule 6). The action was taken after preliminary consideration in August 1973, and after consideration of a detailed budget prepared by the Registrar.

The increase of 75% in subscription appears substantial, but should be considered in the light of the following:

1. Subscriptions have been increased only once in 22 years, and that was 7 years ago.
2. Since subscriptions were last increased, Government salary scales have moved 96%, compared with the 75% increase decided.
3. The increase was based on a budgeted deficit for the current year of $3000, and on the estimated cost of an executive secretary, which was unanimously recommended by Branches for next year. It is expected that the Institute will "break even" next year on the new rate of subscription. The executive secretary can thus be accommodated by an increase in subscription which is still proportionately less than increases in remuneration.
4. The Registrar will prepare a budget annually in future; more gradual adjustments to subscriptions in relation to costs can then be expected.

P. K. FOSTER

President.

Some Aspects of Food Chemistry *

by E. L. Richards

A review of food chemistry is obviously a formidible task, and I have decided that the only approach I can adopt is that of Little Jack Horner, that is to "put in my thumb and pull out a plum". I only hope you enjoy my selection of plums.

Hydrocolloids

Hydrocolloids pay a very important role in food processing, basically because they are able to manage and modify the behaviour of water which is a major constituent of most foods. Consequently they are used to produce many interesting food textures, to prevent separation of ingredients and a host of other functions which are essentially aesthetic. All the food hydrocolloids are polymeric substances built up of identical or related units, and there are a number of important elements which contribute to their behaviour.

As a very wide variety of polysaccharides are used in foods as hydrocolloids let me use them to illustrate some of these features.

(i) the nature of the building block is obviously of importance and in the polysaccharide polymers it is usually the pyranose ring. However, its behaviour is profoundly modified by the presence or absence of hydrophilic or hydrophobic groups. In the polysaccharides the most abundant hydrophilic groups are the unionised hydroxyl groups but others such as the carboxylic acid groups of the alginates or pectins or the sulphate groups in carrageenan may be ionised.

(ii) the nature of the linkage between the units of the biopolymer may affect its conformation and hence its properties and stability. Amylose and cellulose provide a very dramatic example. They are both 1→4 glucans but while amylose with an α glycosidic linkage is an important hydrocolloid, cellulose with a β linkage, has a conformation such that the macromolecules are held together with hydrogen bonds to form a highly ordered fibrillar structure. This is relatively inert to the digestive process so that cellulose plays an almost exclusively structural role in food.

(iii) the degree of branching can also greatly change the solution properties as is shown in the differences between amylose and amylopectin.

Nature has been generous and has provided in abundance a very large number of polysaccharides some of which have been used for centuries. They represent a surprising variety of sugars, their derivatives and glycosidic linkages, but there is still much that the chemist can do. In the first place he can search for new and better natural polymers and during this century we have seen hydrophilic colloids from the sea, alginates and carrogeenans come into wide use in foods. This process continues and an example of a new hydrocolloid developed over the last few years is xanthan gum which is produced by fermentation of glucose with *Xanthomonas campestris*.

It is a very high molecular weight (several million) heteroglycan of D-glucose, D-mannose, and D-glucuronic acid. The basic repeating unit consists of 13 monosaccharide residues of which 10 are in the main linear chain and 3 units are attached as single unit side chains. Xanthan gum is somewhat unusual in that the polysyccharide is partially (about 4.7 percent) acetylated and contains pyruvate units (about 3 percent) attached by ketal linkages. Its solutions have a high viscosity at low concentrations and maintain this viscosity on heating and over a very wide pH range. Xanthan gum has very unusual rheological properties and in fact is the most pseudo-plastic of any gum now available.

This means that its solutions behave as solids until a minimum shearing force is reached above which the system behaves as a liquid. The mini-

*Paper given at NZIC Conference, August 22nd, 1972.

mum shear of chewing is enough to temporarily break the viscosity so that there is good flavour release and very little hang-up in the mouth. This pseudoplasticity is also of tremendous value when a thickened system must be pumped in the plant or used in aerosols. Xanthum gum then has unusual rheological properties and heat, acid, and salt stabilities which make it a versatile food additive.

Secondly the organic chemist has been able to modify abundant hydrocolloids such as starch to meet specific requirements.

The chemically cross-linked starches undoubtedly represent the greatest single advance in food starches over the past 30 years. The starch in the intact unswollen granule is reacted with di- or polyfunctional reagents capable of reacting with at least two hydroxyls in neighbouring molecules. The bridges provide strong chemical bonds which resist rupture during cooking. This means that by adjusting the degree of crosslinking, starches can be tailored to perform under the wide variety of pH, temperature or shear conditions met in food processing. Cross-linked starches for example find extensive use in freeze-thaw foods. The permissable cross linking agents include epichlorohydrin to introduce ether linkages, and sodium trimetaphosphate or phosphorous oxychloride for ester linkages.

While crosslinking improves the stability of hot pastes towards breakdown and loss of viscosity during cooking it does not stop association or gelling. Where clarity or stability of foods stored for a long time in freezers is desired, starch is treated with monofunctional reagents to introduce stabilising groups which impede the alignment of starch chains. Stabilising groups cleared for use on starch are hydroxypropyl, phosphate and acetyl. These are introduced by reacting some of the hydroxyl groups with propylene oxide, orthophospate, acetic anhydride, or vinyl acetate.

Introduction of hydroxyethyl or hydroxypropyl groups at a level of 0.7-0.8 degree of substitution completely stops enzyme action so that, if we must have them, here are non-nutritive starch thickeners. Finally because of the comparatively high cost of many natural gums there is much interest in the modification of starch and cellulose to give them the properties of more expensive gums. One of the commonest derivatives of cellulose and one of the most widely used synthetic gums in the food industry is the sodium salt of carboxymethylcellulose. The introduction of a controlled number of sodium carboxymethyl groups ($NaOOC\text{-}CH_2$ -) introduces water solubility. Its manufacture is a fairly simple conventional reaction in which purified cellulose is first treated with NaOH and then reacted with sodium monochloracetate.

$$R\text{-}OH + NaOH \rightarrow RONa + H_2O$$
$$RONa + ClCH_2COONa \rightarrow ROCH_2COONa + NaCl$$

Instrumentation

One area of food chemistry in which progress has been limited but which in my opinion is on the threshold of major advances is in the use of modern instrumental techniques in analysis. For example infrared spectrometry has very wide application in organic chemistry including of course, the study of food components; it has also been commonly used for the quantitative analysis of multicomponent systems and yet it has had very limited use in the direct study and evaluation of multicomponent food systems. Part of the reason for this has been sampling difficulties in preparation of halide pellets or mulls but the main problems have been the intense water absorption bands which make it almost impossible to discern bands due to other constituents and the radiation scattering properties of some food systems. Most of these problems have been overcome in IRMA, an automatic infrared milk analyser which consists basically of a sampling and homogenising unit, a double beam spectrometer with automatic wavelength selector and a read out unit.

Two short path length cells are used (40 μm), one has the sample pumped through it, the other contains water. The water absorption is automatically cancelled out so that the characteristic bands of the milk components become visible. The band intensities are proportional to the concentration of each of the major constituents. The instrument is calibrated against standard analytical methods and modifications have made it suitable for most dairy products. I can see no reason why similar systems should not be applied to the automatic analysis of many other food systems. An important development over the past ten years has been the use of multiple internal reflection (MIR) or attenuated total reflection (ATR) and there is much interest at the moment in applying this technique to food systems. It provides the opportunity to produce spectra similar to transmission spectra in a direct and rapid manner using samples which are relatively unrestricted in size and therefore in the case of food more accurately representing the average properties of the material.

When we turn from the quantitative measurement of major nutritional components to the detailed analysis of individual classes the striking advances have been in the field of gas liquid chromatography. This is particularly true in fatty acid analysis where the advantages of GLC over other methods have been so great that it has almost entirely replaced them in both research and routine determinations. This has been especially so since the development of polyester stationary phases which enable the separation of methyl esters of fatty acids with varying degree of unsaturation.

The methyl esters for GLC analysis are prepared from triglycerides and other lipids and simple and

rapid methods of transesterification in milligram amounts are now available.

To confirm identification it is usual to run two columns, one polar and one non-polar, and in the case of unsaturated acids it is sometimes necessary to hydrogenate and rerun.

When we turn from the lipids to the sugars we find that the application of GLC has lagged behind. I think it is because the sugars are highly polar, and it has been difficult to prepare volatile derivatives by rapid and general techniques. Much of the early work used the rather inconvenient methyl ethers, but over the past few years volatile O-trimethylsilyl ethers have been prepared simply by treating the sugar in pyridine with an excess of reagent. A problem in the use of these ethers for quantitative analysis is the formation of multiple peaks for each sugar because of anomerisation and ring isomerisation. For this reason an alternative procedure is commonly used in which the sugar is reduced to the corresponding alditol which cannot isomerise. The acetates of these alditols are volatile and can be separated by GLC.

The quantitative analysis of amino acids has been the subject of intense interest and study in many areas of science over the past 15 years and chromatographic techniques particularly ion exchange methods have clearly become established as the preferred methods. The use of GLC has been clearly demonstrated with both N-trifluoroacetyl, n-butyl and TMS derivatives of the twenty protein amino acids.

Flavour

The most dramatic use of modern instruments has been in flavour research where it has been largely responsible for the very rapid advances of the past few years. Most food flavours are complicated mixtures of sometimes hundreds of constituents many present in very small amounts. It has only been possible to separate and identify these compounds in a very large number of foods by the coupled use of gas chromatography and mass spectrometry. However in only a very few cases has a combination of the identified components led to a flavour identical with the natural flavour and there is a danger that research in this field can become little more than a cataloguing of compounds, which might provide a good Ph.D. topic but have little practical use.

An example of the sort of advance which might prove very useful in a practical way has been provided by the Food Research Lab., CSIRO, Sydney. They have identified in the volatiles of unblanched frozen peas three alkyl 2-methoxypyrazines which appear to be of major importance in the flavour of green peas even though present in a concentration of only 1 part in 10^{11}. Flavouring substances such as the pyrazines present in living material are biosynthesised by widely differing routes. However, many of the flavours present in the foods we eat have been formed during storage and processing. The degradation of fats play a special part in these changes. In particular the autoxidation of unsaturated fatty acids by a free radical mechanism leads via hydroperoxides to saturated and unsaturated aldehydes, alcohols, ketones and lower fatty acids, which act as flavours. The mere heating and storage of some natural fats (e.g. milk fat) results in the formation of methyl ketones, lactones and lower fatty acids from some saturated fatty acids.

I would like to discuss in a little more detail the role of carbohydrates as important precursors of flavours in heated foods. There has been a renewed interest in non-enzymatic browning reactions because it has been found that as well as undesirable effects many of the very desirable flavours that develop during toasting, baking, roasting, concentration and dehydration arise from these same browning reactions. Our knowledge of these reactions has grown dramatically over the past twenty years. (Fig. 1).

Step I In the early fifties little more was known than that interaction of an aldose or ketose with a primary or secondary amine gave a glycosylamine. This is a reversible reaction and a high yield of glycosylamine is obtained only if the water content of the system is low.

As a consequence the browning reaction occurs readily in dried and concentrated foods. Nevertheless even in dilute solution some reaction occurs and this is important for flavour production even when browning is negligible.

Step II About the mid fifties it was known that the glycosylamines undergo an Amadori rearrangement into ketosamines which while stable and colourless are nevertheless more reactive in solution than ketoses.

Step III In the early sixties it was found that these ketosamines can react with a second mole of aldose to form diketoseamines, which are much more reactive, so that their formation while not essential does promote the degradations that follow.

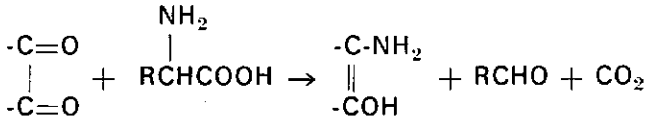
Step IV During the sixties there was a great deal of study of the degradation of these ketoseamines and it has been shown to occur by two distinctly different pathways involving 1,2 enolization and 2,3 enolization respectively. The mechanism of 1,2 enolization is similar to the mechanism of degradation of reducing sugars to furfurals by strong acid. That degradation you will recall requires very drastic conditions. It seems that the presence of the amino group allows the degradation of ketoseamines to occur under the much milder conditions found in stored foods.

1,2-Enolization leads to the formation of 3-deoxyosuloses, unsaturated osuloses, and furfurals.

The osuloses are α-dicarbonyl compounds and as well as we will see later they may play a role in Strecker degradations. The furfurals contribute to the flavour of many foods such as bread and coffee but they are certainly not characteristic of them. These compounds then are of only limited interest in the production of flavours. While degradation through 1,2-enolization appears to be the main route to brown colours in foods it is the alternative pathway of 2,3-enolization which is more important in producing distinctive flavours. Actually the usual conditions in food do not favour this pathway but even an extremely small amount of some of the compounds formed is enough to produce distinctive flavours. Degradation by 2,3-enolization leads to the formation of a 2,4-diulose. This is a key compound, degradation of which can follow any of a number of pathways to compounds with a caramel-like aroma. Perhaps the longest known of these is maltol which is found in roasted cereals, stored milk powder and other browned foods. It has a fragrant caramel or burnt sugar aroma and even at concentrations so low that its own flavour is negligible it enhances the flavour and sweetness of carbohydrate rich foods. However, the most striking of the caramel type compounds are a dimethyl and a monomethyl dihydrofuranone which have an intense, fragrant, fruity caramel odour.

Strecker Degradation

Both 1,2 and 2,3 enolization produce α-dicarbonyl compounds any of which can bring about the Strecker degradation of an α amino acid.

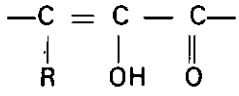


It was thought for a long time that the aldehydes formed in this degradation were responsible for the flavours of roasting etc. It now appears that this is seldom if ever the case. The more characteristic flavours are formed by secondary reactions, following the Strecker degradation and involving the α-amino carbonyl compound formed in the degradation. For example such secondary reactions are held responsible for the more than twenty substituted pyrazines which have been identified among the volatiles of roasted coffee.

Another group of N-heterocycles which can be regarded as having been formed from Strecker degradation, in this case of proline, include 1-pyrroline, 1-acetonyl pyrrole, N-acetylpyrroline and 6-acetyl-1, 2, 3, 4-tetra hydropyridine. They have flavours which have been described as corny, bready and fresh bread.

The rapid advances of the past few years has brought the subject of flavours from non-enzymatic browning to the stage where it is possible to make some generalisations among which are that

(i) compounds with a caramel flavour usually contain the C-alkyl-enol-carbonyl group



These compounds are planar or nearly planar O-heterocyclic or alicyclic structures.

(ii) compounds that contribute a roasted nut, popcorn or bready aroma have planar, unsaturated N-heterocyclic structures containing one or two nitrogens in the ring.

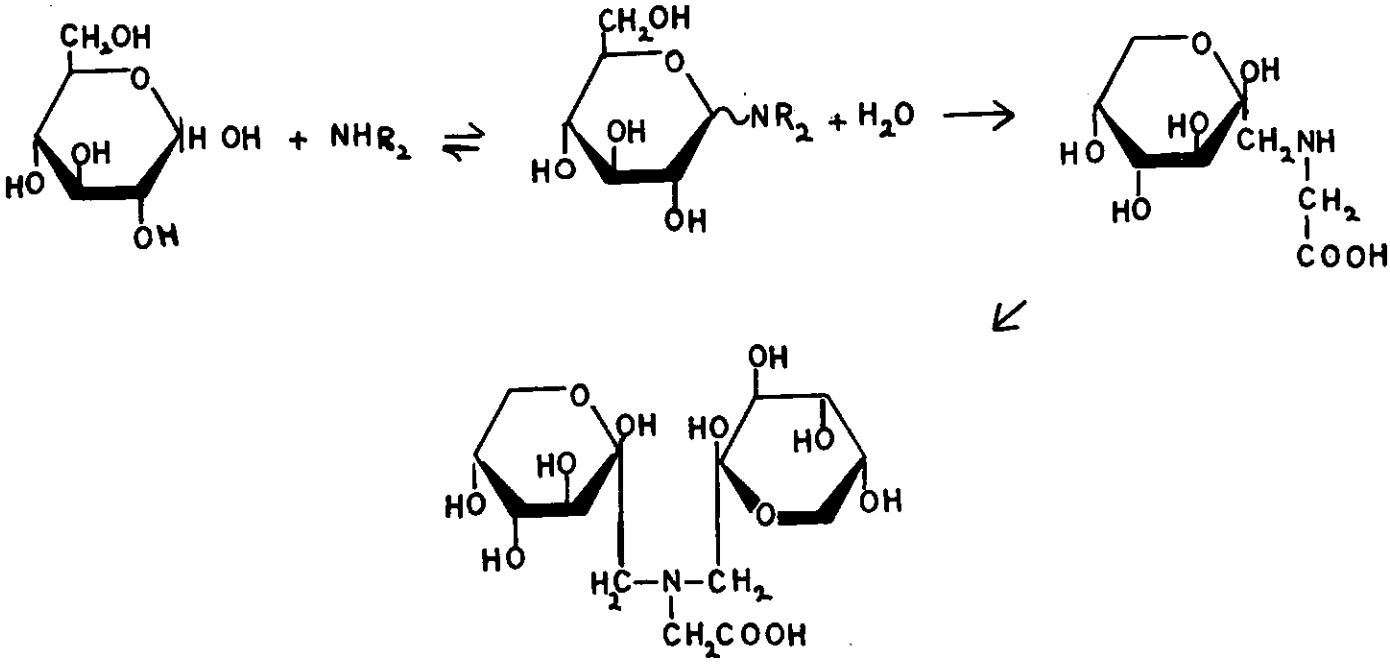


Figure (1)

Insolubilised Enzymes

Finally I would like to gaze into the crystal ball. The importance of enzymes in food processing and preservation can not be overemphasised but there are nevertheless real limitations on their use. This is partly because of the cost of manufacture but is also because at present enzymes are not used in a continuous operation but are used once and then lost.

In recent years there have been brilliant discoveries of procedures for immobilising enzymes by binding them to matrixes such as cross-linked dextran gels or by entrapment of the enzyme within a gel whose pores are large enough to allow the molecules of substrate and product to pass freely but small enough to retain the enzyme.

However, these studies have been mainly concerned with a more detailed understanding of enzymes in biochemical analysis. Insolubilised enzymes for industrial use have been reported but few details are available. But looking into the future one can visualise the use of such systems in say cheese-making, brewing or in fruit juice clarification.

One system that has been studied in some detail is the enzyme glucoamylase entrapped in a polyacrylamide matrix. These studies show the feasibility of long term continuous use of the enzyme in the production of dextrose from starch.

REPORT ON THE CHEMISTRY REFRESHER COURSE for Secondary Teachers held in the Chemistry Department of Otago University from 21st-23rd November 1973

Forty-two science teachers from the Otago-Southland area attended a three-day refresher course in chemistry which was organised and run by Mr. B. C. Cambie in conjunction with Mr. J. S. Urquhart.

The course consisted of a series of lectures from university staff, and practical classes. A brief summary of the programme is as follows:

Wednesday

Lecture I: 'Coordination Compounds' (Dr. R. G. Cunninghame).

Film Session: Films from the National Library relevant to 6th and 7th form chemistry classes.

Lecture II: 'Energy Entropy and Chemical Equilibrium' (Professor G. N. Malcolm).

Seminar on Visual Aid Material.

Inorganic laboratory practical class.

Thursday

Lecture III: 'Methods of Structure Determination' (Dr. B. M. Peake).

Laboratory classes demonstrating instruments. Seminars involving teachers and staff and discussing aspects of teaching chemistry.

Physical laboratory practical class.

Friday

First year Chemistry laboratory practical class.

Lecture IV: 'Nucleophilic Substitution Reactions' (Dr. R. A. J. Smith).

Lecture V: 'SI Units' (Dr. D. V. Fenby).

Organic laboratory practical class.

From this it can be seen that much of the material covered was intended to provide background or to introduce new ideas and concepts to participants rather than be directly applicable to teaching chemistry at the secondary school level.

From the results of an opinion survey conducted among the participants and staff, it would appear that the course was considered most useful and stimulating. Hence it is planned in the future to make a course of this type a biennial event.

Social Responsibilities of Scientists

by Robert Mann

For many people this topic just doesn't exist. Even many scientists say that their knowledge and skills confer on them no special social responsibilities. But to an increasing minority of scientists it's been clear for some time now—and especially since Hiroshima—that scientists do have various important contributions to make to the running of a democratic society. What are these special duties, and how should they be carried out?

First, I stress the duty to **inform** the general public on issues which cannot be understood without the special interpretation of scientists. I see a close parallel with medical duties. The secretary of the New Zealand Medical Association, Dr. Geiringer, has said in a speech in Auckland that in the main, doctors of the future will no longer concentrate on curing patients or researching new cures. These traditional functions, which have occupied the doctor till now will largely be taken over by skilled paramedics. People with medical degrees will spend some of their time supervising these activities, but most of their efforts will be devoted to preventing the social abuse of medical knowledge and methods. Dr. Geiringer cited such 'watchdog' functions as informing the public about the dangers of overpopulation; preventing misuse of medical information for political purposes; and ensuring that the benefits of medicine are made available to the needy.

I found this speech very convincing, and so did some of my fellow teachers of medical students.

I strongly feel that similar socially-responsible duties must be fulfilled by scientists, individually and through their professional organisations. This has already begun. The Royal Society of New Zealand put out a White Paper which informed the public about the Omega radio navigation system. What happened in the Omega affair? The United States armed forces wanted to install a very low frequency transmitter in New Zealand as part of their global Omega navigation system. Omega was to be used by American submarines carrying nuclear missiles and scientists knew this from readily available electronics magazine sources. These submarines use Omega to recalibrate their guidance systems. One of the few possible defences against these missile-firing submarines is to destroy their navigation systems. Clearly, they can't aim missiles accurately at Moscow if they don't know their own position! In the event of a nuclear war, countries harbouring Omega transmitters might well be candidates for hydrogen bombs. When the American navy wanted to install one of these transmitters in our country, in the opinion of many knowledgeable people, our Prime Minister of that day misled the public about these facts. For example he said Omega would be particularly valuable in and around New Zealand; the truth is, however, that Omega is useless within 600 miles of a transmitter. Scientists, including a special expert committee of the Royal Society of New Zealand, our most prestigious scientific body, then helped to inform the public of the scientific facts about Omega. Direct pressure was then put on the Government. The Omega transmitter is now to be bestowed upon Australia instead.

This is a very instructive case history of one kind of social responsibility which scientists must exercise. In such technical matters, the general public can obviously not be expected to make an informed, reasonable decision unless supplied with facts from scientists who do understand the inner workings. With our system of delegated power, in which the people act through their elected members of Parliament, such professional service from scientists on scientific matters is essential; otherwise, democracy cannot operate in the modern technical world.

We've seen other admirable examples of scientists informing the public on scientific issues. Linus Pauling, already a Nobel prize-winner in Chemistry, took on the task of telling people about the health hazards from radioactive fallout. He's generally credited with having helped bring about the partial nuclear test ban treaty, and he was awarded the Nobel Peace prize. Finally on this question of informing the public, let me mention another issue of immediate concern to New Zealanders today. Several groups of scientists in the United States of America have shown that the weed-killer 2,4,5-T causes deformed foetuses in laboratory tests on mice, hamsters and rats. This is true even for currently-produced 2,4,5-T which is relatively low in one very poisonous impurity. But the New Zealand Government has repeatedly assured the public that there's no risk to humans from 2,4,5-T. This statement contradicts the facts and interpretations produced by several prominent overseas experts, and the New Zealand Government's failure to protect us from this danger contrasts sharply with the action of the U.S. Government, which, for the stated reason of the health hazard, stopped spraying it on their enemy, Viet Nam. It then becomes a duty for those New Zealand scientists who know the

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Biochemistry Dept., University of Auckland.

* based on a lecture given to Manawatu Branch, NZIC, and a talk given on NZBC.

full facts to disclose them to the public, and by so doing to challenge the Government to explain and justify its assurances. Evidence indicates that exposure to 2,4,5-T, especially by aerial spraying, does constitute a danger.

If the public know this, they may use the democratic process to influence their members of Parliament, with a view to creating appropriate restrictions on dangerous use of 2,4,5-T. But if the scientists have declined to pass on the facts to the general public, then this democratic process could not begin. It's very clear that scientists play a key role here; they have a special social responsibility to inform.

Perhaps you will ask, "But how will we know which version to believe, when scientists disagree?" That is a fair question, but there usually will not be much difficulty over this. During the great debate on radioactive fallout previously mentioned, controversy arose between famous scientists as to how much harm fallout might do. Some experts, such as Pauling, said that large numbers of birth defects and some kinds of cancer were likely to be caused by the extra radiation. Dr. Teller, one of the main creators of the hydrogen bomb, said that people who live at high altitudes already got a higher dose of radiation from cosmic rays, but were not known to have a higher mutation rate. Barry Commoner, who has since become well known as an ecologist, pointed out that no-one had ever studied the question! Teller went silent. Here was a case where scientists disagreed but the public had little trouble in making up their mind.

In any case, surely it is better for the debate to be complicated than non-existent as it usually is today!

Now to consider not what scientists say, but what they do. Are there any scientific experiments which ought not to be done? Or should we just do all the science we're capable of doing? We can start on this issue by distinguishing between most science, which is not obviously going to be harmful, and that minority of experiments which are overtly designed to harm people. It's fairly easy to decide about the directly harmful type—we just don't do them! This simple rule would apply for example to research designed to produce weapons of warfare—especially nuclear, chemical or biological. Weapons have no possible good use; they can only be harmful, and scientists should refuse to work on them. Usually, of course, an individual scientist's refusal will not stop the programme; but diffusion of responsibility over several people does not mean that individuals have none. Someone else may take up what another may lay aside; nevertheless, it ought to be laid aside. One biologist envisages the situation which may be just around the corner in molecular biology, where a scientist holds in one hand a mutated nucleic acid from a virus, and in the other hand, a test-tube of proteins which, when added to the nucleic acid, will form a killer virus of unprecedented virulence, against which no defence is known. Would you pour together the two solutions? Of course you wouldn't. To bring into existence such a virus would be irresponsible—a perversion of science. This example is not too hypothetical—it's very close to the moral position of some scientists today, and it makes quite clear the fact that we cannot just murmur "Science is morally neutral" as we create the weapons of destruction.

But most scientists have no such clear moral decision in their daily work, because they're doing experiments which are not designed to harm people. The quality-control chemist in a New Zealand paint factory is a long way from the secret weapons research labs. The majority of scientists can feel secure in the knowledge that their work is not intended to harm humans; some may even help them! But the trouble is that almost any science can be perverted to anti-human uses, in ways which the originator had no possible means of foreseeing. When Einstein formulated his famous equation "Energy = change of mass times the speed of light squared", he couldn't foresee the nuclear bombs which would be made using this as an essential basis.

We can't blame Einstein for the bomb; neither can we take the crude neo-Luddite solution of ceasing to do all science just because some of it may turn out to be misused. What then can we do? I suggest that the answer lies in building more expert scientific advice into the democratic process. Farmers and businessmen are heavily represented on bodies like the Agricultural Chemicals Board; why not more scientists? I'm not suggesting that scientists are on the whole more moral than other citizens; what I am saying is that they have special knowledge which should be taken into consideration in a formal way for decisions on matters where scientific knowledge or methods might be misused to the public harm.

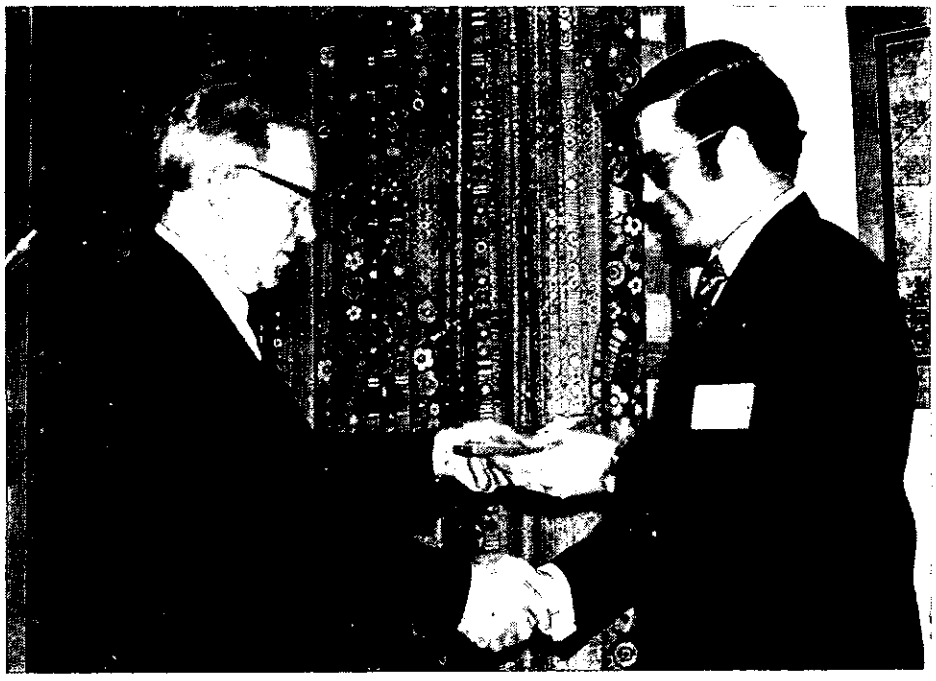
How could professional scientific bodies like the NZIC be affected by ideas such as I've mentioned?

Firstly, I suggest more gathering and reporting of data on matters which need expert scientific measurement and interpretation and which are of great public importance. Readers of "Science" will be familiar with a model of this: the American Association for the Advancement of Science organised a special Herbicide Assessment Commission which visited south Viet Nam to review the impact of the U.S. military's so-called defoliation programme which has heavily sprayed with potent herbicides more than one-seventh of south Viet Nam. Reports of this Commission have appeared in "Science" and I offer them as very instructive examples which the NZIC might emulate in some matters of local importance.

Similarly, journals and conferences of scientific associations would pay more attention to issues of social importance.

I'd like to see bodies such as the NZIC influencing education more: in the development of modern curricula, and in providing booklets, speakers and other resources for school classes on matters in which the NZIC is professionally competent.

CORDAY-MORGAN MEDAL PRESENTATION



Professor S. Slater presents the prize on behalf of the Chemical Society of London, to Professor Phillips.

(Photo—Harry Todd, F.M.N.Z.I.C.)

The Corday-Morgan Medal and Prize of the Chemical Society, London, was presented to the winner, Professor L. F. Phillips at the last Conference dinner (August 1973).

Up to three awards are made annually in different branches of chemistry to chemists of British nationality. The awards are made for publications in the immediately preceding five years, for the most meritorious contributions to experimental chemistry. The recipients must be under the age of 36.

OBITUARY

Mr. D. F. Sandys Wunsch O.B.E., B.S. (McGill), MA (Oxon), AIMM, MIChem.E, F.N.Z.I.C., died recently at the age of 86.

He was born in England, did mining work in Canada and Nigeria, and was production manager of chemical factories in England. In 1929 he came to New Zealand to be Managing Director of Dairy Products Ltd. In the following years he revived the near-defunct lactose industry which now as the Lactose Company of New Zealand has several factories. The factory at Kapuni was built during World War II to produce lactose for penicillin production.

He was Chairman, Scientific and Industrial Research Council from 1955-1959, was a former Vice-President of the Institute of Chemical Engineers, and was awarded an OBE in 1957. He was made a Fellow of the NZIC in 1944.

NEW APPOINTMENTS

SOIL BUREAU

Dr. R. B. Miller was recently appointed Director of Soil Bureau, D.S.I.R., in succession to the late Dr. M. Fieldes.

Dr. Miller joined the Soil Bureau in 1944 after graduating M.Sc. in Chemistry from Otago University. He obtained a B.A. from Victoria University College in 1948 and a Doctorate in Soil Chemistry from the Royal Agricultural College of Sweden, Uppsala, in 1952.

As a member of the Soil Chemistry section until 1967, Dr. Miller was particularly concerned with the ecosystem approach which he pioneered in the 1950's. Consideration of the soil in its total environment has proved highly productive in the understanding of water, energy and nutrient cycles. This work led to the production of information on the distribution and movement of many elements in soil profiles and plants.

In 1968 and 1969 Dr. Miller worked at FAO headquarters in Rome on an Andre Meyer Fellowship. He was correlator for the Australasia-Pacific Region of the FAO/UNESCO "Soil Map of the World" project, and the first integration of knowledge of Pacific soils into a world context will form a basis for future land use planning in the Region.

On returning to Soil Bureau in 1970, Dr. Miller became head of the Scientific Administration Section, and has also been in charge of data and productivity aspects of the Bureau's national soil appraisal programme.

He is a past President of the New Zealand Soil Science Society, and served on the Council of the Royal Society from 1970-72. For some years he was Professional Status Committee Convenor of the N.Z. Institute of Chemistry. Dr. Miller was Secretary-General of the 1962 International Soil Conference held in Palmerston North.

TESTING LABORATORY REGISTRATION COUNCIL — TELARC —

APPOINTS FIRST DIRECTOR

The recently established Testing Laboratory Registration Council which will commonly be known as TELARC has appointed Mr. J. A. Gilmour to be its first Director. The Council's registered office is to be established in Auckland and Mr. Gilmour took up his full-time duties as of January 1974.

Mr. Gilmour has a B.Sc. (Metallurgy) from the University of New South Wales and was until appointed Director of TELARC Senior Technical Officer in Australia's National Association of Testing Authorities (NATA), a position he held from 1962 until now. His Australian experience will be invaluable to TELARC as it is intended that this organisation will cooperate closely with NATA to ensure that TELARC and NATA registrations will be accepted in both countries. Mr. Gilmour, who is 34, is married and has two children.

The Testing Laboratory Registration Council Act gives the functions of the Council as: "to promote the development and maintenance of good laboratory practice in testing and to establish and maintain a scheme for registration of testing laboratories which apply for registration and which comply with that practice." The scheme will benefit exporters but as well domestic manufacturers, engineering, and consulting firms will also gain by having available this independent assessment of their testing facilities.

Professor R. F. Meyer of the University of Auckland is Chairman of the Council.

INSTITUTE PRIZES

Entries for the following Institute prizes must be received by the Registrar, Box 1926, Christchurch, by April 30, 1974, or the General Secretary, Box 250, Wellington, as stated below.

1. THE I.C.I. PRIZE

This prize of $100.00 and a medallion has been donated by I.C.I. (New Zealand) Ltd. The conditions of the award are as follows:

1. The prize shall be awarded to a member of the Institute who, in the opinion of the Council, has made some contribution to some branch of chemical science, the contribution to be judged by research work published or accepted for publication during the five years immediately preceding 30 April in the year of the award.
2. Applications by members, or nominations, which may be submitted by Branch Committees or by individual members, must be accompanied by copies of papers presented in support of the entry. The Council itself may nominate candidates for the award.
3. A nomination or application, once made, shall stand for five years, but material which fails to satisfy clause 1 shall automatically be deleted, and additional material may be presented at any time.
4. If in the opinion of the Council there is no candidate of sufficient merit, the Council may refrain from making the award.
5. The prize shall be presented at the annual conference of the Institute or at a meeting of the Branch to which the prize-winner belongs.
6. A member to whom the prize has been awarded shall not be eligible for re-nomination.

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2. THE CHEMICAL ESSAY PRIZE

The New Zealand Institute of Chemistry shall offer annually a prize for an essay or review on a chemical topic. The conditions of the award are as follows:

1. The prize shall be open to anyone who has not attained the age of 25 years before April 30 in the year of the contest, whether a member of the Institute or not.
   (Note: Entries from students will be welcomed).
2. The entry shall be not longer than 5,000 words.
3. The entry shall be in a form suitable for publication and the Institute shall have the right to publish the winning entry.
4. Applications, in completed form, must be received by the General Secretary, P.O. Box 250, Wellington, not later than 30 April in the year of the contest.
5. The entries shall be judged by a Committee of examiners set up by Council for the purpose. The President of the Institute and the Editor of the Journal shall be ex efficio members of this Committee.
6. The award shall be made by the Council after consideration of the report of the Committee of examiners, and the presentation of the prize shall be made, whenever possible, at the annual conference of the Institute.
7. No award shall be made if, in the opinion of the Committee of examiners, there is no entry of a sufficiently high standard of merit.
8. The value of the prize shall be such sum as the Council may from time to time determine, and the prize shall be spent on books or instruments to the satisfaction of the Council.

   (Note: The value of the prize is at present $50).

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3. EASTERFIELD AWARD

(1) The medal shall be awarded to chemists within New Zealand in recognition of the quality and originality of their research work.

(2) Candidates must be under the age of 35 years at the 30th April 1973.

(3) The award will be open to all chemists whether or not they are members of the Royal Institute of Chemistry or the New Zealand Institute of Chemistry.

(4) The major portion of the candidate's research work submitted must have been carried out in New Zealand.

(5) No person may be awarded the Easterfield Medal more than once.

(6) The successful candidate will be required to deliver a lecture on the subject of his research at the Annual Conference of the N.Z. Institute of Chemistry, or on some other suitable occasion.

(7) The medal shall be awarded biennially and presented to the successful candidate on the occasion of his lecture.

(8) The Selection Committee reserves the right to make no award in any year if the standard of work submitted is not of sufficient merit.

(9) Expenses necessarily incurred by the Medallist in connection with the delivery of his lecture will be defrayed.

(10) Applications by or on behalf of candidates for the award must be in the hands of the General Secretary of the N.Z. Institute of Chemistry not later than 15th April 1974 and must be fully supported by all relevant papers (either published or unpublished).

BRANCH OFFICERS, 1973-74

Auckland:

Chairman: Mr. J. G. Fletcher.
Secretary: Dr. D. Shooter.
Treasurer: Dr. I. Devereux.
Committee: Prof. C. Cambie, Dr. A. C. Herd, Dr. P. E. Nelson, Dr. P. G. Robinson, Mr. I. Clements, Mr. A. C. Kennett, Mr. G. Ruffell.

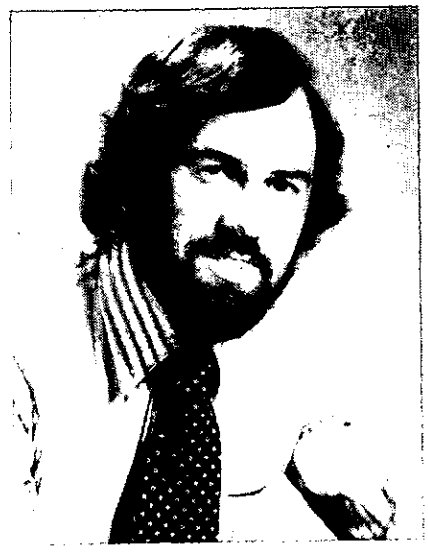
Gavin Fletcher graduated from the University of Auckland in 1964. He was employed by Nicholas Products Ltd. until 1966, when he went to the United Kingdom. There he worked with Aspro Nicholas Ltd. and later became a Master in Chemistry at Eton College.

On returning to New Zealand in 1968, he joined the staff of the Auckland Technical Institute as a Tutor in Chemistry. Under his supervision, the chemistry section of the Applied Science Department has become the largest in New Zealand Technical Institutes. He has also played a leading role in organising two national symposia of chemical interest as well as several short courses in chemistry. He has been the Metric Coordinator for that Institute, having the task of training industry and commerce in metric units.

Mr. Fletcher has served on the Auckland Branch Committee for three years, two of which he was Branch Editor. The present format of luncheon meetings were his brainchild. He also served on the Institute Committee for studying technician training in 1972. He is Vice-President of the Kiwanis Club of Auckland, which keeps him active in community service.

Waikato:

Chairman: Dr. A. G. Langdon.
Secretary: Dr. P. C. Molan.
Treasurer: Dr. J. H. Watkinson.
Committee: Dr. C. L. Davey, Dr. E. Payne, Dr. D. E. G. Sheat.
Council Delegate: Dr. W. P. Judd.
Branch Editor: Dr. M. M. Sutton.



Alan Langdon is a graduate from Victoria University of Wellington, where he studied electrolyte solutions for a Masters degree and colloid and surface chemistry for a doctorate. A National Science Foundation award from the University of North Carolina at Chapel Hill supported post doctoral studies on diffusion and ion exchange processes in clays and gels. In 1971 he took up an appointment as lecturer in physical chemistry in the School of Science at the University of Waikato. Current research interests include: colloid and surface chemistry particularly in relation to agricultural problems such as phosphate fixation and nutrient mobility in soils, diffusion studies, protein chemistry, detergency and sanitation in the dairy industry, and trace element chemistry.

Apart from chemistry, Dr. Langdon lists skiing, fishing and wine making as interests. He is currently secretary of the South Auckland Conservation Association.

Manawatu:

Chairman: Dr. J. G. Robertson.
Secretary: Dr. L. N. Nixon.
Treasurer: Mr. C. Towler.
Committee: Miss G. P. Berry, Dr. A. M. Brodie, Dr. R. P. Garland, Mr. G. M. Ryburn, Dr. W. B. Sanderson, Dr. I. D. Watson.

Dr. J. G. Robertson graduated M.Sc. with first class honours in Biochemistry from Otago University in 1964. From there he went to the Plant Chemistry Division, D.S.I.R., where he studied microbial physiology and biochemistry under Professor R. D. Batt, graduating with a Ph.D. from Massey University in 1969. He was awarded a Damon Runyon Fellowship in Cancer Research which was held in 1970 under Professor D. F. Parsons, Roswell Park Memorial Institute, Buffalo U.S.A. on the study of biological membranes using electron microscopy and in 1971 under Professor L. I. Rothfield, University of Connecticut Medical School at Farmington on the properties of bacterial membrane proteins. After returning to the Applied Biochemistry Division, his current research is on the function of membrane systems in legume root nodules.

Wellington:

Chairman: Dr. L. J. Porter (re-appointed).
Hon. Secretary: Mr. W. Freitag.
Hon. Treasurer: Dr. C. W. Childs.
Council Delegate: Mr. C. L. H. Stonyer.
Branch Editor: Professor R. J. Ferrier.
Committee: Mrs. Z. Demchenko, Mr. A. A. Turner, Mr. E. Dempsey, Professor N. F. Curtis.

Canterbury:

Chairman: Dr. G. Wright.

Graeme Wright is Reader in Chemistry at the University of Canterbury. He graduated B.Sc.(Hons) in chemistry from Canterbury in 1960, joined the Chemistry Department staff in 1962, and completed his Ph.D. in 1965. A year spent as Leverhulme Fellow at Sussex in 1966 with Professor Colin Eaborn consolidated his interest in physical organic chemistry and he returned to Canterbury to continue research work in aromatic substitution reactions, particularly those with unusual mechanistic features. In the last two or three years his interests have increasingly centred on the use of mass spectrometry in organic chemistry, and his major research effort is now built around the department's MS902 mass spectrometer.

Otago:

Chairman: J. L. Grigg.
Hon. Secretary: Dr. M. G. Shepherd.
Hon. Treasurer: J. Urquhart.
Committee: Assoc. Prof. D. J. Brasch, Prof. A. D. Campbell, J. W. McChesney, W. Thompson, Dr. R. Laverty, Dr. B. M. Peake.
Delegate: Assoc. Prof. D. J. Brasch.
Branch Editor: Dr. B. M. Peake.

Mr. J. L. Grigg is in charge of the soil chemistry section at Invermay Agricultural Research Centre, Mosgiel. He is responsible for the Ministry of Agriculture Advisory Soil Testing Service in the South Island and for a programme of research aimed primarily at extending our knowledge of soil fertility assessment.

Mr. Grigg gained his M.Sc. in chemistry at Victoria University College in 1943 and has been employed by the Department of Agriculture (now the Ministry of Agriculture and Fisheries) since then except for 3 years spent with the New South Wales Agricultural Research Institute at Wagga Wagga. His work has been in the field of chemical assessment of soil fertility. His main interests have concerned molybdenum, phosphorus and nitrogen availability in New Zealand soils.

MEETINGS AND CONFERENCES

FIFTH INTERNATIONAL CONFERENCE ON ATOMIC SPECTROSCOPY

At the Fourth International Conference, which was held at Toronto from 29th October to 2nd November 1973, it was decided that the Fifth Conference in this series will be held at Monash University near Melbourne, Australia, on 25th-29th August 1975. The Conference will be sponsored by the Australian Academy of Science, and, like other Conferences in the series, will be particularly concerned with the applications of atomic spectroscopy to spectrochemical analysis. Further details may be obtained from:

Dr. J. B. Willis,
Secretary,
5th International Conference on Atomic Spectroscopy,
CSIRO Division of Chemical Physics,
P.O. Box 160,
Clayton, Victoria 3168,
Australia.

A Symposium on Gastrointestinal Absorption

Meeting of the Nutrition Society of New Zealand with the New Zealand Society of Gastroenterology under the auspices of the Palmerston North Postgraduate Medical Society.

Veterinary Science Department,
Massey University, Palmerston North,
February 29, 21, 22, 1974.

Perspective in Protein Chemistry

A symposium is to be held jointly by the Manawatu branch of the N.Z.I.C. and the New Zealand Biochemical Society on aspects of protein chemistry from research laboratories in the Palmerston North area.

Date: Friday 12 July 1974.

Venue: Science Building, Massey University, Palmerston North.

Extracts from Council Meeting, December 1973

The report of the 1973 Conference Committee was received. Registrations had totalled 356 making this the largest conference to date. Council members expressed their appreciation to the Conference Committee for their work in making such a success of the conference.

The preliminary statement of accounts revealed a substantial excess of income over expenditure and it was RESOLVED (Secretary, Canterbury) THAT the nett profit from the 1973 Conference be credited to the Overseas Visitors Fund.

CONFERENCE, 1974

The 1974 Conference will be held in Auckland, 26-29 August. Professor Cambie is Conference Chairman and Dr. P. S. Rutledge is Secretary. Planning is in progress and the first circular will be distributed early in 1974.

SCIENCE CONGRESS, 1967

The R.S.N.Z. Science Congress will be held in Dunedin in January, 1976. An invitation from the organising committee for the Institute to "host" a session was referred to the Otago Branch for its consideration.

AMERICAN CHEMICAL SOCIETY CONFERENCE, 1979

In the spring of 1979 the A.C.S. and the Chemical Society of Japan will co-sponsor a meeting to be held in Honolulu. Council agreed to accept the invitation to the N.Z.I.C. to become an "official participant".

"PERSPECTIVES IN PROTEIN CHEMISTRY"

The Manawatu Delegate advised that the Manawatu Branch was planning a one-day symposium with the above title to be held in July, 1974. Details will be advertised in the Journal.

APPOINTMENT OF OFFICERS, ETC.

The following officers, representatives, committees, etc., were appointed or re-appointed:

Registrar: Mr. D. J. Hogan (until December, 1975).

Auditors: Shanahan & Winder.

Editor: Miss Joan Mattingley.

Journal Business Manager: Mr. R. C. Turner.

Employment Office: Mr. C. L. H. Stonyer.

Hon. Librarian: Mr. S. C. Brooker.

UNESCO Representative: Mr. J. H. D. Nash.

T.C.A. Executive Committee for Science: Dr. W. E. Harvey (Deputy Mr. C. F. Denmead).

List of Members Committee: Dr. J. W. Blunt (convener).

S.A.N.Z. Representatives: Mr. C. L. H. Stonyer, Dr. P. K. Forter.

Membership Committee: Professor G. A. Wright (appointment expires 30/10/75), Mr. J. S. Pollard (appointment expires 30/10/75), Professor J. W. Tomlinson (appointment expires 30/10/76).

Standing Committee: Dr. P. K. Foster (President), Mr. C. L. H. Stonyer (Wellington Delegate) and Dr. L. E. Harvey (Secretary).

BRANCH GRANTS:

RESOLVED (Secretary, Otago) THAT Branch Grants for the year be fixed at $100.00.

OVERSEAS VISITORS

Professor A. B. Foster, Chester Beauty Research Institute London, has been suggested as a possible visitor in 1975.

RECRUITMENT OF NEW MEMBERS

A paper from the Manawatu Branch was received. The following recommendation in the report concerned primarily with Branch activity were endorsed by Council.

(1) That in 1974 an extensive recruitment campaign be staged at all branches, primarily directed at potential graduate members.

(2) That, to this end, a recruitment officer be appointed by each branch, and if necessary co-opted onto the branch committee.

(3) That sufficient copies of the booklet "An Invitation" be printed and supplied to such recruitment officers.

(4) That the recruitment officer seek the co-operation of the local University in securing the names of members graduating in chemistry, and that he, or whosoever be delegates, personally contact each graduate, presenting him with the booklet, and after due time following this up with an application for membership.

It was further agreed the Council should extend an invitation to join the N.Z.I.C. to members of the R.I.C. and of the Oil and Colour Chemists Association who are not at present members. The question of joint or reciprocal membership with the Nutrition Society, N.Z.I.F.S.T., etc., will also be considered.

THREE-YEAR COURSE FOR SCIENCE TECHNICIANS

The Waikato Branch presented a paper suggesting the introduction of a three-year terminating course for science technicians. Dr. Harvey pointed out that the proposed course structure did not meet the requirements of the T.C.A. for three-year courses and it was agreed that Drs. Harvey and Davey should reconsider the proposals with a view to bringing them into line with T.C.A. requirements.

JOURNAL MATTERS, ETC.

Miss Mattingley reported that plenty of material was coming to hand for the Journal.

The List of Members and the Rules and Commentary will be distributed with the February issue of the Journal.

The publication of the Pollution Report produced by Canterbury has now appeared and is available to members at $1.50.

Ajax Chemicals had requested to purchase 500-600 copies of the safety booklet which they are proposing to distribute to customers. It was agreed that they should be offered the booklets at 40 cents each for a bulk order.

The Manawatu Delegate advised that the Branch had nearly completed a new slide/tape production on careers in chemistry which would be available shortly.

The Waikato Branch has offered to produce a decennial index to the Journal.

ROYAL SOCIETY OF NEW ZEALAND

Miss Mattingley reported verbally on the structure of the R.S.N.Z. with particular reference to the Member Bodies Committee's powers and functions. A report will be published in the Journal to provide a basis for later discussion. The President indicated that he was proposing to write to the President of the R.S.N.Z. with comments and suggestions on the structure of the R.S.N.Z.

CONFERENCE OF INSTITUTES OF CHEMISTRY, ROME

Dr. Foster and Professor Petersen attended the conference and presented reports. These will be edited for publication in the Journal.

Council agreed to two recommendations in Dr. Foster's report as follows:

(1) The Secretary should formally establish with his counterparts in other English-speaking Institutes an exchange of public relations information.

(2) Comments should be sought from the U.K. and from Canada on the question of technician membership.

HOSPITAL SCIENTIFIC SERVICE

Miss Mattingley presented a verbal report which will be circulated to Council members and will subsequently appear in the Journal. There are considerable problems in this area but it was deemed advisable to deter any major action until the Wilson case had been resolved.

MR. DAVID WILSON

Mr. David Wilson, a Member, had sought the assistance of the Institute in appealing aaginst his non-appointment as Tutor Technologist at Greenlane Hospital.

Dr. Harvey reported that the Standing Committee has discussed the matter, offered support to Mr. Wilson and engaged a lawyer to present his case which raises major matters of policy with the hospital scientific service. It was RESOLVED (2nd Vice-President, Auckland) THAT the actions of the Standing Committee be ratified and THAT the Institute would offer to meet Mr. Wilson's full legal expenses up to $250.

GRADES OF MEMBERSHIP

A number of documents touching on the matter of possible technician membership have appeared in the Journal and/or been circulated to Branches.

After considerable discussion it was agreed that Branches should concentrate on discussion of the second option presented in the Journal article, and that the matter would be discussed again following the President's tour of

PUBLIC RELATIONS

Professor Wright had prepared a report on the public relations activities undertaken in accordance with the discussion made by Council on 19/8/73.

It was agreed that all press releases should appear in the Journal so that all members would be aware of Council's publicly expressed views.

It was RESOLVED (Waikato/Auckland) THAT the sum of $200 should be made available to continue with the public relations exercise for the current year, and that the situation be reviewed again at the end of the year.

SUBSCRIPTIONS AND FINANCE

The Registrar presented a budget for the years ending in 1974 and 1975 together with comparable (actual) expenditure for the years ending 1969 to 1973. It was estimated that in the current year expenditure will exceed income by $300 and Council members agreed that an increase in subscription was both inevitable and urgent. Estimates of the likely expenditure for the year ending in 1975 showed that a basic subscription of $14 would yield sufficient income to just cover the expected expenditure if an executive assistant was appointed.

It was RESOLVED (Waikato/Chair) THAT subscriptions for the 1974-75 year be fixed at the rate of $14 for Fellows and Members, $7 for overseas members and $2 for Graduate Members.

Council expressed the view that subscriptions should probably be re-raised an additional $2 for the year 1975-76.

EXECUTIVE SECRETARY

Council received the report prepared on the proposed position of executive secretary, prepared by Professor Wright, the Registrar and the eGneral Secretary.

It was RESOLVED (Auckland/Wellington) THAT a position of Executive Secretary be created, in terms of the tabled report. The position will be advertised in Christchurch and a subcommittee consisting of the President, 2nd Vice-President, the Canterbury Delegate and the Registrar was appointed to interview applicants and make a recommendation for the appointment to the Council or the Standing Committee.

EASTERFIELD AWARD

Dr. Harvey outlined discussions he had had with the R.I.C. regarding the administration of the Easterfield Award. A detailed proposal will be sent to the R.I.C. but no problems are anticipated.

It was RESOLVED (Editor/Canterbury) THAT a new fund called the Easterfield Fund be established and that the monies at present held in trust for the R.I.C. be credited to this fund.

Polymer Group

If one considers the occupational list of members interested in polymer chemistry it would appear that there might be some difficulty in forming a group in NZIC at present.

However, members of this specialised group, if formed, may well find meetings and discussion very profitable and beneficial to their own interests and those of their companies. The quality of a group is not decided by its numbers.

There is an increasing world interest in the degradation and re-use of polymers. Apart from direct re-use in a recycling process the mechanisms by which polymers form and break down, the handling of monomers and associated products and their safety must remain the responsibility of Chemists.

It is recommended that such a group be formed in a manner comparable with the aims and ideals of the Plastics and Polymer Group of the Society of Chemical Industry in the U.K.

As with other groups which have been affiliated to the NZIC it is to be hoped that membership would be made available to all chemists and not just those within the Institute.

If any polymer chemist is interested in the formation of a group please contact:-

Mr. A. C. Kennett,
c/- Chemistry Division,
DSIR
P.O. Box 2224,
AUCKLAND.

A. C. KENNETT

BRANCH NEWS

Auckland

Professor H. N. Parton addressed an attentive audience at the October evening meeting on "Physical Chemistry over 40 years". He discussed two investigations, one which occurred in the early 1930s and subtitled "The Contents of a Mare's Nest", and the other, the last investigation which he supervised, completed in 1972. Appropriately Professor P. de la Mare proposed a humorous, witty vote of thanks.

Dr. Peter Nelson, Chemistry Division, D.S.I.R. and Branch Secretary Dr. Peter Robinson arranged an excellent Gas Chromatography Symposium in October. This meeting — well supported by equipment suppliers and 68 people, firmly established the Gas Chromatography Group within the Institute. A report appears elsewhere.

Dr. I. C. Willox, Group Technical Manager, Dominion Breweries Ltd. — a very able Scottish chemist gave a delightful and obviously well received address to the November meeting when he spoke on "The perfect pint — A blend of Chemistry and the Brewers Art." Unfortunately attendance was very poor but was made up for by the interest shown by those present.

Mr. J. G. Fletcher, and staff of the Chemistry Section of the Applied Science Dept., A.T.I. together with Mr. A. C. Kennett and members of the Auckland Branch of the N.Z.I.E. organised an outstandingly successful symposium entitled "Recycling of Water and Waste Materials" at the A.T.I. in October. This Symposium was jointly sponsored by this Branch, the N.Z.I.E. and the N.Z. Prod. E. Over 100 chemists and engineers attended from Invercargill to the Bay of Islands. Three resolutions concerning the management of waste disposal and water were forwarded to Government and other interested parties.

Mr. I. Clements has produced a list of Auckland Branch members — a huge task — and one which has been welcomed by members. Additions and alterations should be addressed to the Branch Secretary.

Representation of the chemistry profession on the Technical Laboratory Registration Council has been the concern of the Branch Committee. Our Council has been urged to keep the need for our profession to be represented as a matter of course before the Minister of Science.

Mr. A. C. Kennett (Chemistry Div. D.S.I.R., Auckland) would like to hear from chemists and others interested in forming a "Polymer Chemistry Group" within the Institute.

The Branch has received notification from the N.Z.I.F.S.T. that they are keen to jointly sponsor another symposium next year.

Mr. B. J. Cowell has joined U.E.B. Industries.

Annual General Meeting, November, 1973

The A.G.M. was again held in the Senior Common Room of the University of Auckland. Despite the pleasant surroundings, the attendance was disappointingly small. Apart from the appointment of the 1974 committee, the major business centred on two issues facing the Institute, Technician membership and increased subscription rates.

The meeting resolved to suggest the second proposal for technician members as set out in the October issue of the Journal. The increase of subscription was treated rather cautiously, with the general opinion being that members would be better served with services that could be provided by increased subscription.

Conference 1974

The conference committee consists of Prof. R. C. Cambie (Chairman), Prof. C. O'Connor, Assoc. Prof. G. A. Wright, Messrs. P. J. Chaffe, J. C. Bowles, S. G. Brooker, I. Clements, Drs. P. E. Nelson, M. J. Nicholls, A. M. Roberton and P. S. Rutledge.

The full committee met twice before the end of 1973, and the foundations for the N.Z.I.C. conference in Auckland, August 1974 are well and truly laid.

FMRA

Dr. M. S. White visited Adelaide and Melbourne in January for discussions of FMRA research on Christmas Island phosphates with staff of British Phosphate Commissioners, the Australian Mineral Development Laboratories (Amdel) and CSIRO Division of Soils and the Australian fertiliser industry.

Dr. J. Rogers is to present a paper in the fertiliser technology session of a symposium "Sulphur in Australasian Agriculture" arranged by the Sulphur Institute, Washington D.C., U.S.A., the Australian fertiliser industry and CSIRO in Canberra on 19-21 February. He will visit Sydney and Melbourne also.

Manawatu

At the 23rd Annual General Meeting of the Branch, Dr. J. G. Robertson, Applied Biochemistry Division, D.S.I.R., was elected Chairman for 1973-4. The meeting was addressed by the outgoing Chairman Mr. G. M. Ryburn, on "The Chemist and Consumer Protection".

Dr. D. F. Nelson, who is the head of the Forensic Group at Chemistry Division, D.S.I.R., Auckland spoke to the October branch meeting on "Science and the Investigation of Crime."

The November meeting of the Branch took the form of a visit to the Lion Brewery. Members were shown around the plant by the Production Manager, Mr. B. Lawrence and were also able to enjoy sampling some of the company's product.

Massey University

Dr. G. J. Stubbs of the Max Planck Institute, Heidelberg, visited the Department of Chemistry, Biochemistry and Biophysics. He gave a seminar entitled 'The structure of Tobacco Mosaic Virus'.

"Forces Between Atoms and Molecules" was the theme of a meeting for School and University First Year Teachers. The programme consisted of an address by Dr. I. D. Watson ("Billiard Balls and Treacle"), followed by a panel discussion on the "Teaching of Bonding in Molecules at the 7th Form and First Year University Levels".

Dr. M. E. H. Howden, School of Chemistry, Macquarie University, Australia spent two days in the Department of Chemistry, Biochemistry and Biophysics, discussing extramural chemistry with staff members. The department is offering Chemistry Intermediate as an extramural course for the first time in 1974.

Dairy Research Institute

Extensions to the building are continuing with construction of offices between the research block and the Dairy Products Development Centre and an addition to the Library.

Dr. J. Thompson has joined the Biochemistry section of the Fundamental Research Division. Dr. Thompson joined the Institute after 6 years at McGill University, U.S.A.

Mr. R. S. Jebson, Head of Milkfat and Butter Section, has spent several weeks in Australia visiting various factories and research associations. Messrs. R. Norris and D. S. Munro of the same section are to spend several weeks with the Chemical Engineering Division of C.S.I.R.O. in Melbourne doing work associated with a co-operate research project.

Dr. W. B. Sanderson, head of the Applied Research Division is to visit Central and South America with a marketing official of the Dairy Board.

Wellington

Institute of Nuclear Sciences—D.S.I.R.

Dr. T. A. Rafter led the New Zealand delegation attending the XXVII IUPAC Conference at Munich in August, and also attended a IUPAC scientific conference at Hamburg immediately following this conference. Additional members of the New Zealand delegation were Professor Tomlinson from Victoria University and Dr. Spedding from Auckland University.

Mr. W. J. McCabe has been invited to participate in an I.A.E.A. (International Atomic Energy Agency) meeting on marine radioactivity studies at Monaco in October, and is at present in Europe for this purpose. He will spend two months at Harwell before returning.

Dr. C. J. D. Adams visited A.N.U. in July and August to make use of the facilities in the research school of earth sciences for rubidium/strontium dating measurements on rocks taken from Nelson and Westland.

I.N.S. staff members attending the annual Institute of Chemistry conference were Drs. J. R. Hulston, H. C. Sutton and N. E. Whitehead.

Chemistry Division—D.S.I.R.

In September Dr. J. MacMillan from Bristol University delivered a lecture entitled "Gibberellin Biosynthesis", while in October Dr. R. Hurst, Director of the British Ship Building Industry Research Association, Newcastle, spoke on Research Funding in Britain.

Dr. N. K. McCallum left in September to spend a year studying aspects of tetrahydrocannabinol chemistry with Professor Mechoulam at the Hebrew University, Jerusalem.

Mr. J. G. Kelsey of the Chemical Engineering Section is investigating membrane processes as part of his research for a Ph.D. at the University of Birmingham.

Mr. R. H. Newman left for the United Kingdom in September. He was awarded a 1973 NRAC Post Graduate Research Fellowship to study for a Ph.D. degree on Fourier Transform N.M.R. at the University of East Anglia, Norwich, England.

Miss P. Vickerman who recently gained an M.Sc. from Victoria University has joined the Food Laboratory.

Dr. A. J. Ellis, Director of Chemistry Division, recently returned from a Nata meeting on international cooperation in the field of geothermal energy resources. Later this year he will go to Lesotho as a United Nations consultant for the setting up of a National Chemical Laboratory Service.

We were saddened by the sudden death of Mr. Richard P. Eardley, BSc., ANZIC, on December 16, 1973. Mr. Eardley came to New Zealand in 1971 after spending 24 years with the British Ceramic Research Association, Stoke-on-Trent. For the last 2½ years he was a member of the cement and concrete section, Chemistry Division. An analyst of outstanding ability, he had been mainly instrumental in organising a current project on the evaluation of chemical, x-ray diffraction and microscopic methods for the analysis of cement in which work he obtained the cooperation of over 40 overseas laboratories.

Mr. R. B. Fieldes, a recent BE (1st Hons) graduate of the Chemical Engineering School, Canterbury University, has joined the Chemical Engineering Section of Chemistry Division.

Dr. M. H. Timperley has joined the Water Laboratory after two years post-doctorate work with Dr. E. M. Cameron's Geochemistry Section in the Geological Survey of Canada. While in Canada, Dr. Timperley was involved in the development of analytical methods for metals in lake sediments. For his Ph.D., he studied aspects of biogeochemistry at Massey University under the supervision of Dr's R. R. Brooks and P. J. Peterson. His MSc and BSc were taken at Auckland University where Dr. J. Aggett supervised the M.Sc. research.

Chemistry Department — Victoria University of Wellington.

Professor J. F. Duncan, Head of Department, has been awarded the Sir Ernest Marsden Medal for service to science.

Professor J. W. Tomlinson recently returned from sabbatical leave spent at the Imperial College, Southampton University.

Otago

Chemistry Department

Professor R. E. Corbett has left to spend a sabbatical year in England and will be based at University College, London. In his absence Professor A. D. Campbell will be acting Chairman of Department.

Associate Professor R. A. Matheson has left for one year's sabbatical leave undertaking research in electrochemistry at the University of Newcastle upon Tyne.

Dr. M. C. Couldwell, a recent graduate in inorganic chemistry from Canterbury University has joined the staff as an assistant lecturer. Her research interests include inorganic kinetic studies and X-ray crystallography.

Dr. R. T. Weavers has returned to the department as Mellor Post-Doctoral Fellow in chemistry. He has spent the last two years undertaking research at University College, London.

Mr. B. C. Cambie has returned to Thames High School after spending a year as a teaching Fellow. During this time, his activities included the organisation and running of a most successful refresher course in chemistry for secondary school teachers in the Otago-Southland area (for details of this course see elsewhere in this journal).

Biochemistry Department

Dr. G. N. Emerson has left on sabbatical leave to undertake research in bacterial metabolism in Professor H. L. Kornberg's department at the University of Leicester.

Dr. J. F. Williams from the University of New South Wales visited the department as the assessor for the second year medical examination. He also delivered a stimulating lecture on the biochemistry of Myocardial Infarction.

Recently, several members of staff in this department were awarded research grants by the Medical Research Council.

A refresher course for secondary school biology teachers was held in the department on 26th/27th November 1973. This was well attended by forty teachers from the Otago-Southland area. Emphasis in the course was placed on providing simple but effective biochemical experiments to illustrate current biology courses. Some lectures were also given on topics in the syllabus which teachers had found confusing.

Pharmacology Department

Dr. R. L. H. Heimans has arrived from Melbourne University to take up a position as lecturer in the department. His research interests include the study of the pharmacology of the central nervous system, and in particular the actions of narcotic analgesics and drug dependence.

Professor F. F. Fastier, Assoc. Prof. J. G. Blackman, Dr. R. Laverty have recently received grants from the Medical Research Council of New Zealand for studies on (respectively): the pharmacology of amidines, the physiology and pharmacology of cholinergic synapses, and the function of catecholamines in the central nervous system.

BOOK REVIEW

"Environment and Industry — A pollution report by New Zealand scientists", 99 pp, N.Z. Institute of Chemistry, 1973, $1.95.

Much of what one reads under the title of "environment" consists of dire warnings by journalists of the horrors we are facing or are about to face. This slim volume, based on a series of lectures to the Canterbury Branch of the New Zealand Institute of Chemistry, is different. It contains eleven chapters by eleven different authors, all experts in ther own fields, in which a serious attempt has been made to define the nature of pollution problems relevant to New Zealand, describe the magnitude of those problems and to discuss the ways in which the various forms of pollution may be alleviated or eliminated.

The first two chapters discuss the general problem of pollution, industry, people and standards of living. Both authors make it clear that the basic problem is people, that most of the problems facing the world could be solved with known technology and that to do so will involve us all in a little more effort or cost to pay for the "good things" of life.

The next six chapters cover the petroleum, paper, dairy, meat, wool and leather industries. The amount of detail in these capters is sufficient to satisfy the curiosity of the technically-minded reader and yet the presentation is clear enough for the lay reader to follow. It is encouraging to know that in every one of these industries, the problems of pollution by private industry are being actively investigated and that control measures are either in action or under development.

The contribution on pesticides is more general than the earlier ones. This is followed by a chapter on air pollution which, while interesting, is rather out of line with the tenor of the other chapters.

The work is rounded off by a chapter which comments on the law and the work of two official committees relating to air pollution and some work which is being carried out in Christchurch on urban air pollution. These last two chapters seemed to this reviewer to be a little out of character with the rest of the book but this in no way detracts from the value of the whole work.

This book will be of interest to all who are concerned with the New Zealand environment and with what is being done to preserve it. It should be compulsory reading for all journalists and conservationists.

The (anonymous) editor is to be complimented on producing such a coherent publication from so many authors and the printers are to be praised for the general quality of the production. I found only one misprint.

A.G.W.

Copies are available through the Registrar, P.O. Box 1926, Christchurch. The price to NZIC members is $1.50.

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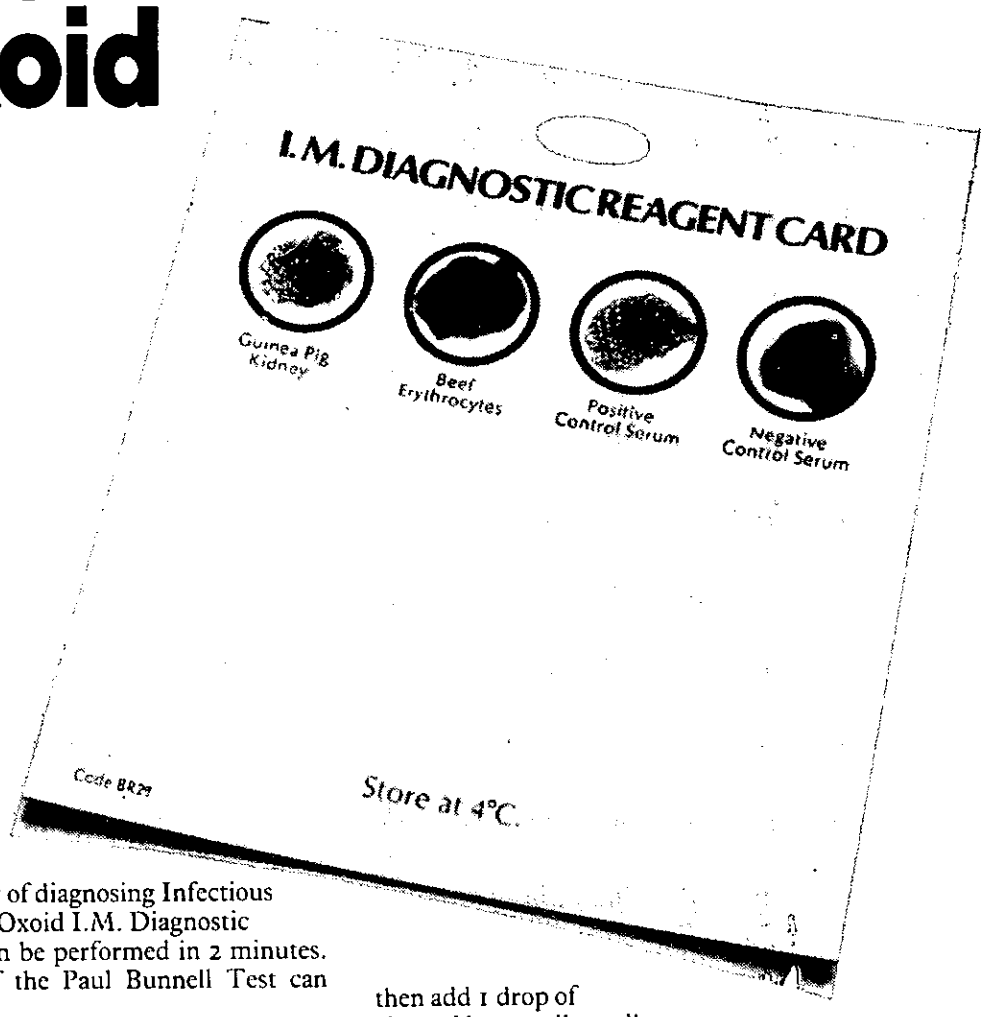

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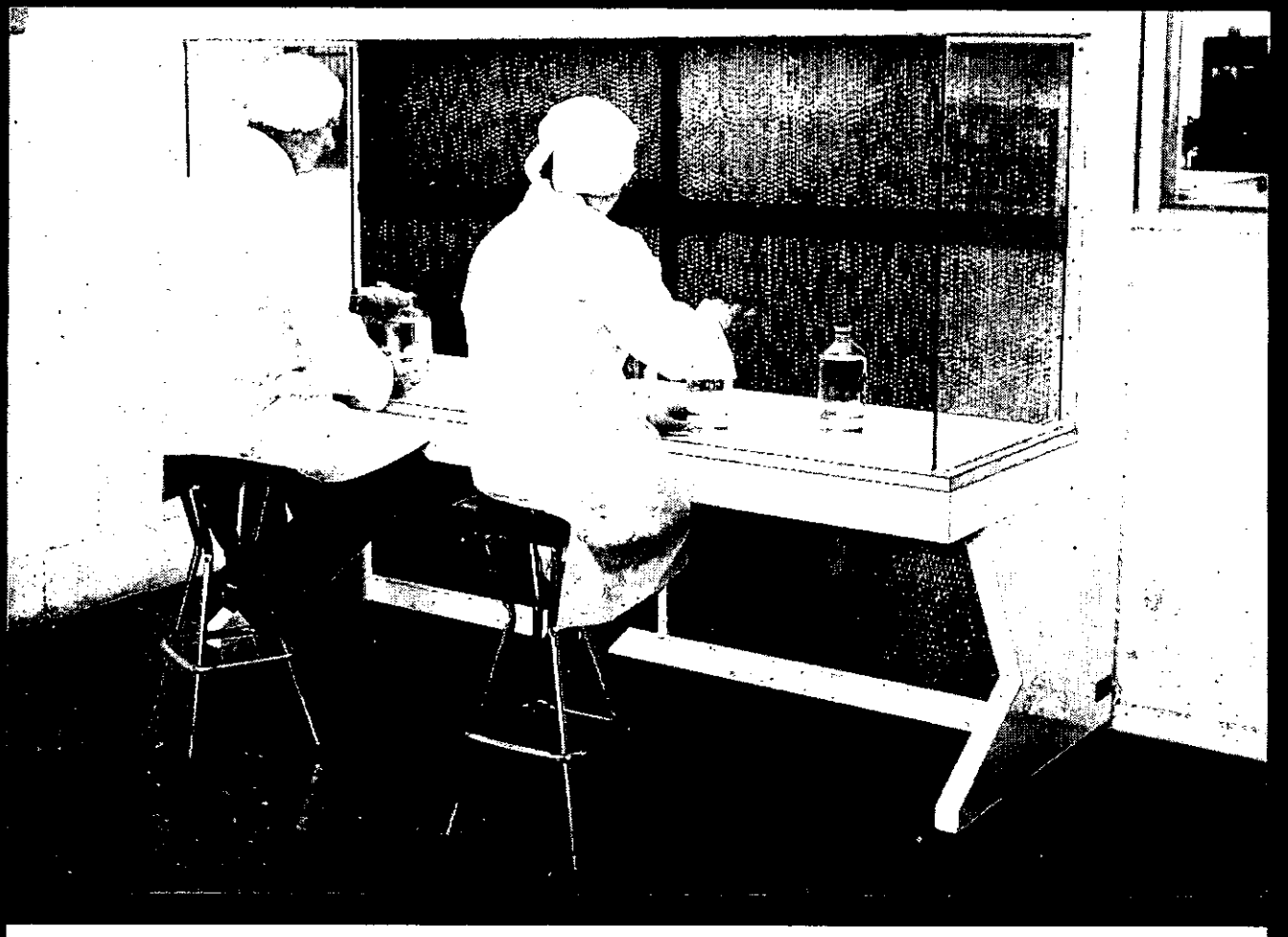

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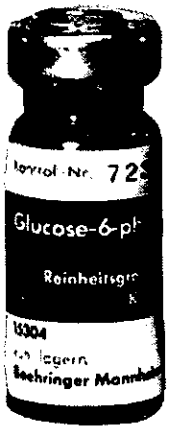
Medical

analytical bio chemistry



For the solution of a variety of considerably complex questions, many analytical methods are employed by the biochemist. An almost classical method of analytical biochemistry came into existence from biochemistry itself, viz. the enzymatic analysis.

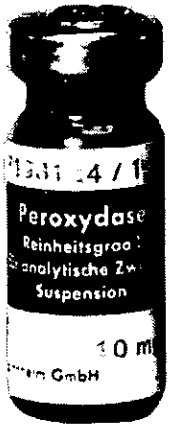
Enzymatic analysis means determination of metabolite concentration with the aid of enzymes, measurement of activities and study of the characteristics of enzymes in vivo and in vitro, and analysis of the control and regulatory functions within the cell and in organ metabolism.

molecular biology

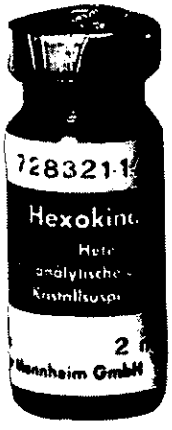
The research fields of protein and nucleic acid biosynthesis are nowadays lumped together – unfortunately – under the term "molecular biology." In our program we offer enzymes, substrates, templates, primer, inhibitors and auxiliary reagents, all of which are indispensable for the study of molecular action mechanisms.

enzymology

Enzymologic research revolutionizes biology not only because of the mushrooming number of newly-discovered enzymes. To the extent to which the biologist advances into cellular regions, he will become an enzymologist; to the extent to which the enzymologist interprets biological functions of cell components enzymatically, he will become a biologist. Thus, enzymology has become one of the main pillars of all biological disciplines.



clinical chemistry



This program is noted for its search for ever more specific and predictable test methods for medical research and routine diagnosis while adhering to the rising requirements for precision and accuracy of laboratory data. On the other hand, such a program must also take into consideration the requirements for simplification and rationalization. The ideal requirement is reached when simplification of actual labour allows, at the same time, for an increase in precision.

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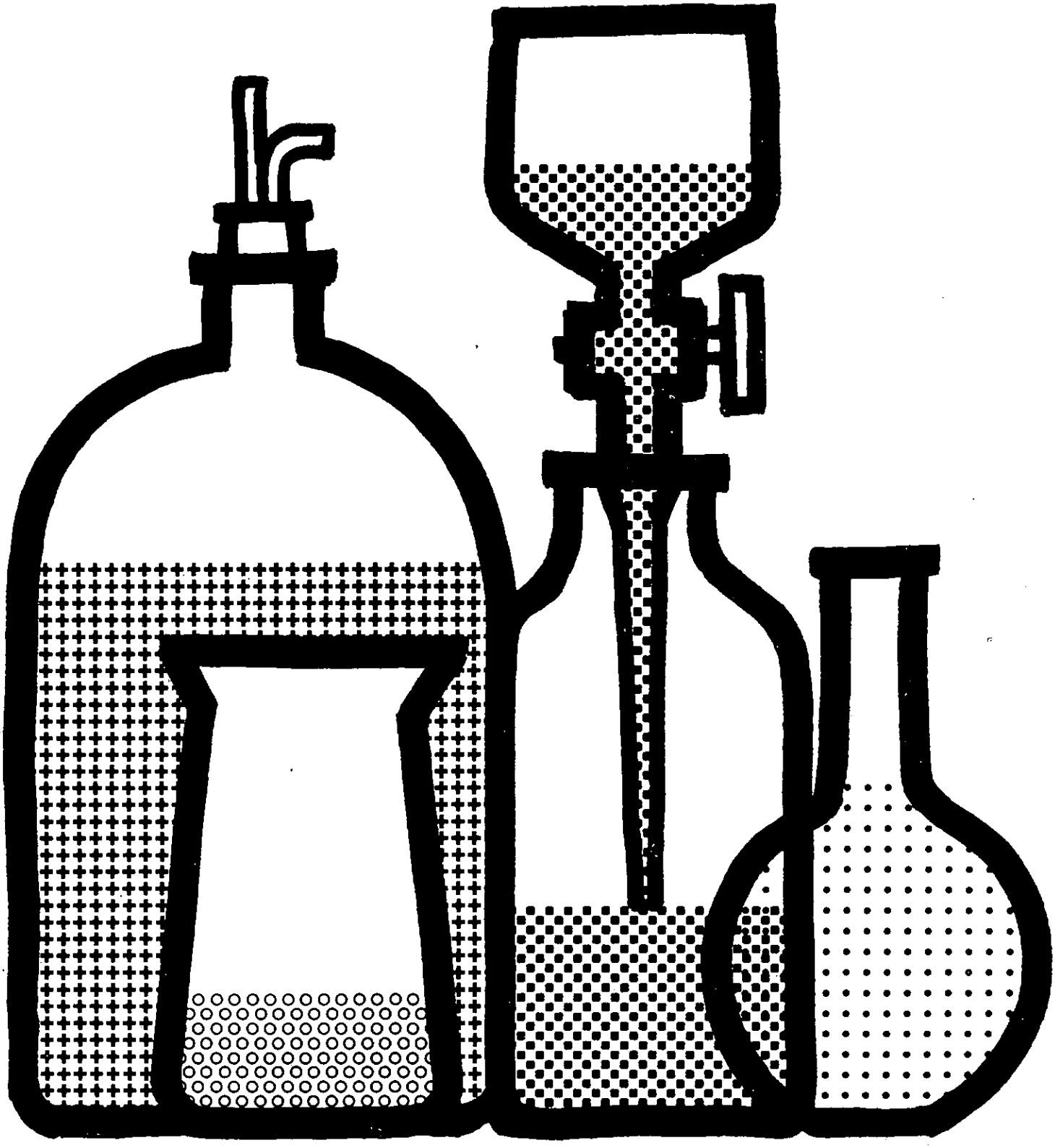

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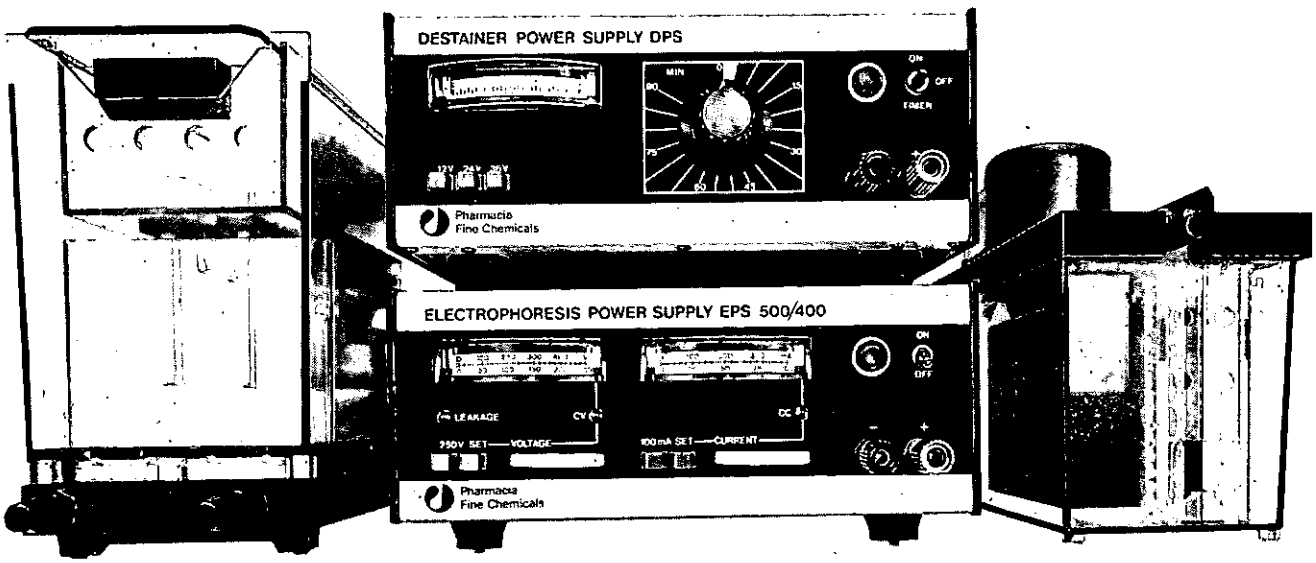

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