

# CHEMISTRY IN NEW ZEALAND

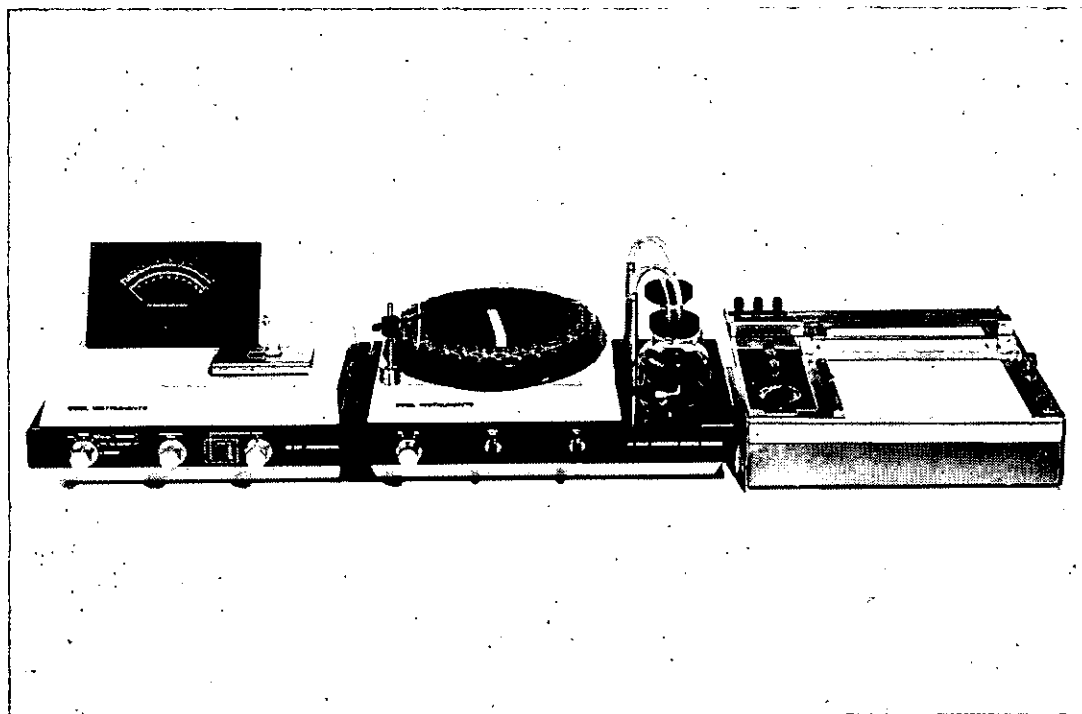
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Vol. 34, No. 6, December, 1970

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# CHEMISTRY IN NEW ZEALAND

## Journal of The New Zealand Institute of Chemistry

Vol. 34, No. 6, December, 1970

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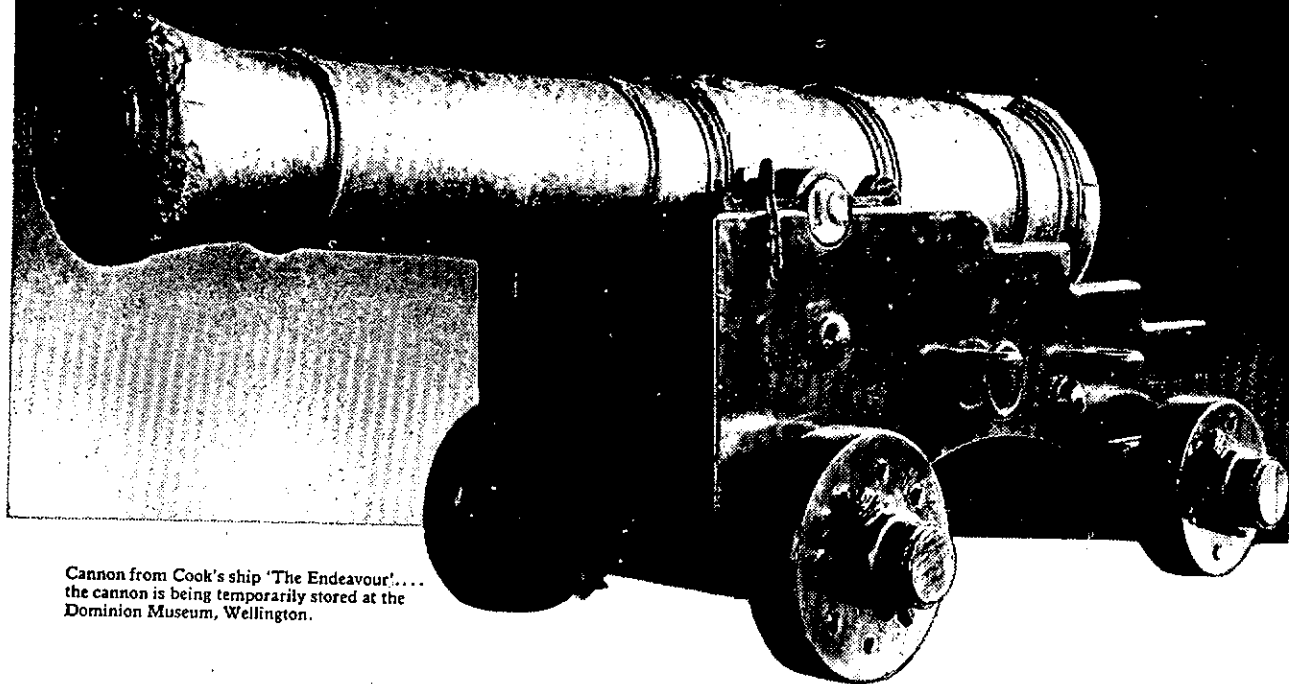


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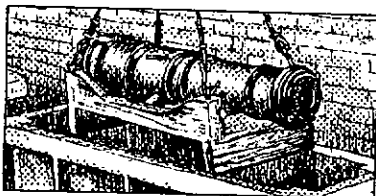
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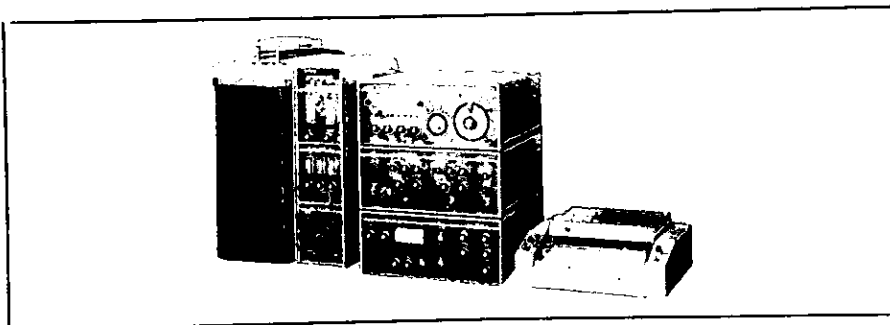




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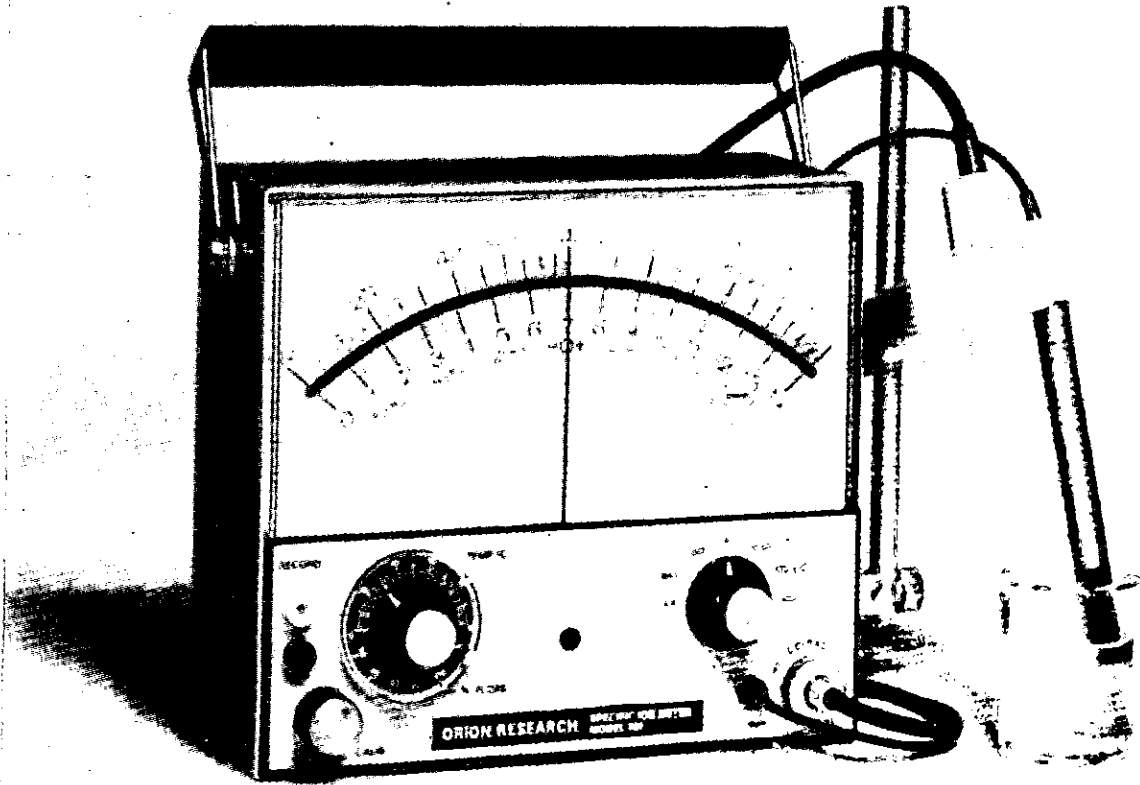
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## THE CHALLENGE FOR HIGHER EDUCATION IN THE SEVENTIES

Presidential Address to the New Zealand Institute of Chemistry,  
Palmerston North, 25 August 1970

By T. A. Rafter

### Introduction

In the *Dominion* of 4 August 1970, there appeared an article under the heading 'Praise for Polytechnics' which read—"Technical institutes were in no way inferior educational institutes, the Minister of Education, Mr Talboys, said yesterday—there was an established need in the community for institutes and they must be recognised as one of the three pillars of tertiary education in New Zealand together with universities and teachers' colleges. The relationship between the universities and the institutes was an area of lively interest. Traditionally, institutes covered an area of knowledge at a more practical angle, but there was some conflict of interest between the two bodies."

Referring to the possible national diploma award system for institutes he said, confidence in institutes would be gained by establishing confidence in the courses they offered.

The report then goes on to show the considerable expansion in technical education, e.g., "in 1959 there were 53,000 full-time students compared with 97,000 in 1969; part-time students rose from 186 to 1,700; block course students from 5,203 to 16,000 and the number enrolled with the Technical Correspondence School had climbed from 4,053 to 14,200."

I have quoted this statement by the Minister of Education, because in certain aspects, it summarised for me the title that I have chosen for this Presidential Address—"The Challenge for Higher Education in the Seventies".

It would have been much easier for me to have chosen a scientific subject such as one or other of the many branches of Nuclear

Sciences, as I did for my addresses to the Branches of the Institute. For this address, I have moved into the field of education, and I realise the opportunity I have given to those better qualified in such matters to cut me down.

I felt I should depart from a scientific topic to an educational one—if science and education can ever be really separated—because for a few years I was a representative of scientists as a co-opted member to the Council of the Central Institute of Technology, and then by the twist of fortune or misfortune—I know not as yet which—I became the Chairman of the Council with Government approval to spend \$5-million on Stage I developments, with plans for a 500-bed hostel now under preparation; and Stage II now on the drawing board, with \$4-million additional for the development of what I think will be a magnificent complex of buildings on a wonderful site at Heretaunga—a fitting tribute to the courage and planning of Directors of Technical Education such as Dr Lee, and the former Minister of Education, Mr A. E. Kinsella.

To educate myself, I felt work was needed on such a topic as "The Challenge for Higher Education in the Seventies". In thirty years of working in the laboratories of D.S.I.R. I have seen a great change in the working habits and opportunities for scientists. Thirty years ago only a scientist, or a cadet training by part-time study for a degree at the University, could be trusted to carry out the manipulations necessary to arrive at a scientific judgment.

I can remember the first carpenter to assist the scientists in the Dominion Laboratory, the first glassblower, and the first woman tech-

nician who was taken on with as much mis-giving as if we were committing a grave sin.

What do we find today? If my own Division of D.S.I.R. can be taken as typical, as I think it can, alongside the physicists, chemists and engineers we have technicians in science and engineering, in glassblowing, in mechanical, electrical and electronic engineering, as well as librarians and essential typing and clerical services.

When I attended my first Institute Conference at Palmerston North in 1945, the work stopped in the laboratory for most of those scientists present. Today technicians are faithfully carrying the burden in the laboratory so that I will be able to obtain necessary data to prepare a lecture next week that is to be delivered in Tokyo the following week.

We have seen in the laboratories a revolution that has resulted not only in the great expansion of present day knowledge, but has greatly increased the more efficient utilisation of the scientist's time.

Some of you here tonight can remember the courses prepared and the training offered for the Laboratory Technician Certificate, run by the Institute. Or you may have supervised the practical examination for entry into the Institute of Chemistry after passing the necessary university pre-requisites.

While we remember the past we are frequently unconscious of the present, and systems can be built-up around us that make the headlines before we are really aware of their existence. How many, even here tonight, know what a polytechnic really has to offer? The universities have been our Alma Mater, and in our secondary school days a Technical College was looked upon as a place where those of lesser academic ability than ourselves must train for trades above the labouring state.

### The Philosophy of Education

Decisions have to be made on the planning for tertiary education in New Zealand. The Minister has said that the relationship between the universities and the institutes

was an area of lively interest. He also said that there was the possibility of a national diploma award system for increasing confidence in institute courses.

In this statement is summed up the conflict which has gone on for years in education at the tertiary level in Great Britain and Australia. New Zealand stands at the threshold of change. As scientists we learn from the mistakes and theories of our fellow scientists and we re-check and re-build again. Should not the educationalist also plan and make decisions cognisant of the experiences of others?

These experiences are of facts and philosophy. Cardinal Newman<sup>(1)</sup> defined the university as "the high protecting power of all knowledge and science of fact and principle, of enquiry and discovery, of experiment and speculation—it maps out the territory of the intellect and sees that there is neither encroachment nor surrender on any side". He favoured liberal knowledge and said that "useful knowledge" was a "deal of trash". Newman focussed his definition upon one essential function that is "the conservation of knowledge and ideas and their transmission to an *elite* body of largely undergraduate students". He believed that research had no place within the university.

In 1930 Abraham Flexner published his treatise on the Modern University in which he highlighted the very significant changes which had taken place since the writings of Cardinal Newman 80 years before. Flexner's definition of universities was that they were "institutions consciously devoted to the pursuit of knowledge, the solution of problems, the critical appreciation of achievements and the training of men at a *really high level*".

But the universities of the 1930's were changing even as Flexner wrote his thesis, for Clark Kerr sensed the change and complained that the universities were becoming too many things—"secondary schools, vocational schools, teacher training schools, research centres, businesses, these and other things simultaneously". In his opinion, some

universities were engaged in "incredible absurdities" and a "host of inconsequential things". Worst of all, they became 'service stations' of the general public.

Clark Kerr postulated the idea of the multiversity, an all embracing system catering for the whole of the needs of the community without restriction by basic charter, responding to immediate needs wrought by social evolution, catering for new professional occupations as these emerge and maintaining at the same time high international standards of scholarship and research.

Michael Oakeshott<sup>(2)</sup> distinguishes in education between a "language" (manner of thinking) and a "literature" or "text" (what has been said from time to time in a "language"). He says, "what is being studied in a vocational education is a literature or text, not a language. What is being acquired is a knowledge of what has been authoritatively said and not a familiarity with the manner of thinking which has generated what has been said".

A university education is unlike a vocational education because it is an education in "language" rather than "literature". A university is concerned "not merely in keeping an intellectual inheritance intact, but to be continuous by recovering what has been lost, restoring what has been neglected, collecting together what has been dissipated—university teachers are different "because they are themselves learners engaged in learning something other than they undertook to teach".

Vocational education on the other hand is concerned with acquiring a skill—"acquiring a specific body of knowledge and being able to move about within it with ease and confidence and to use it . . ." The design of a vocational education is to be concerned with current practice and always with what is 'believed to be known'. How it came to be known, what errors and imperfections it has left behind are of little significance.

Dr Phillip Law, Vice-Chancellor of the Victorian Institute of Colleges, said that he agreed with Oakeshott's distinction as applied to the Australian scene if the words "University Education" were replaced by "liberal education" because he said that in Australian universities a majority of the courses are concerned with vocational education. Sufficient attention had not been given to this fact by those who have been most assiduous in attempting to define the differences between the various types of tertiary educational institutes.

### Development in Great Britain

In Great Britain a White Paper in 1956 on Technical Education<sup>(3)</sup> introduced a four-tier system of colleges—colleges of Advanced Technology; regional colleges; area colleges and local colleges. For six years the Colleges of Advanced Education labelled their degree-type graduates "Diploma of Technology" but finally because recognition by the public of such diplomas was unsuccessful, all Diploma of Technology awards made over that period were retrospectively converted into degrees. *The Diploma of Technology was a mistake.*

The Committee on Higher Education under Lord Robbins in 1963 firstly transferred the Colleges of Advanced Education (CATS) to the University sector, and secondly established the Council of National Academic Awards to provide degrees for students in non-university institutions.

In the White Paper of 1966, the Government committed itself to an even greater expansion of higher education than was forecast in the Robbins Report by developing a distinctive sector of higher education within the Further Education System to complement the Universities and the CATS.

It was realised that within higher education, in addition to those students who have the time and ability to take full-time and sandwich courses of degree standard, there were also two other sets of students no less important—

- (a) Those seeking a qualification that requires a course of higher education which is below degree standard, and
- (b) Thousands of students who being already employed can find time only for part-time day and/or evening courses which may lead to a degree or to a qualification below that standard.

The Government believed that leading colleges concerned with higher education should provide courses to meet the needs of students in all three categories, and because of their comprehensive range of subjects and the character of the work they would be distinguished from other kinds of higher education institutions. As mixed communities of full-time and part-time teachers and students, they would have a more direct link with industry, business and the professions.

The position in Great Britain in 1965 was as follows:

- (1) There were 40,000 full-time and sandwich students in advanced courses in technical, commercial and art colleges in England and Wales, divided approximately as follows—

40,000		
Degree courses	H.N.D.	Sandwich Students
12,000	8,000	20,000
Arts		Other courses
7,000		13,000

- (2) There were 100,000 students studying to obtain recognised qualifications by attending part-time day and evening courses at an advanced level (i.e., classified as advanced in the statistics of the Department of Education and Science).

All but one of the 25 Regional Colleges and more than 30 Area Colleges and Colleges of Commerce were offering *full-time degree courses*.

These figures represented a remarkable achievement on the part of local educational authorities and colleges.

The National Plan of the Government was to make available by 1969-70 places for over 70,000 full-time and sandwich students following advanced courses in Institutes of Further Education.

To achieve these needs greater concentration on full-time higher education was required, but as many departments and colleges were *too small* to sustain high academic standards and to provide a satisfactory corporate life, a considerable measure of concentration was essential.

### Polytechnics

The Government believed that the best results would be achieved by developing higher education on polytechnic lines and proposed to designate a limited number of major centres in which a wide range of both full-time and part-time courses could be developed to cater for students at all *levels of higher education*. It was proposed that as a generic term, these major centres should be called "polytechnics".

The Secretary of State aimed to settle the list of polytechnics for about 10 years, and not to add to it within this period. In the long term the polytechnics would be expected to concentrate wholly or largely on students of 18 years and over pursuing courses of higher education. The polytechnics were expected to grow to at least 2,000 full-time students, plus part-time students, from the areas they served.

It was *not* envisaged that polytechnics should have a monopoly of full-time higher education within the Further Education System. Their work would be supplemented by that in many other colleges, particularly in specialist fields, and higher education courses for part-time students would be needed in many colleges not engaged in full-time work.

Great Britain now has Universities, CATS and Polytechnics. When the White Paper I

have referred to was published in May 1966, it was severely criticised by the Association of Teachers in Technical Institutes<sup>(4)</sup> as being restrictionist in outlook and ambiguous in sections, but if the polytechnics were to differ from other colleges in degree and not in kind then the Association could support the policy.

### The Binary System of Higher Education

In my opening remarks I referred to the Minister's statement in which he referred to the three pillars of tertiary education in New Zealand. What is mostly discussed today is the binary, not the trinary system of tertiary education.

Mr Crosland, when Secretary of State for the Labour Government, enunciated in a speech at the Woolwich Polytechnic<sup>(5)</sup> a new principle to underline future government policy which implied a divorce between the universities and the rest of higher education.

This was the "binary" principle which said that there should be two systems of higher education at degree level; one in the autonomous sector (the universities) and one in the publicly-controlled sector (the technical colleges) and for B.Ed. courses (the colleges of education). He also said that the second sector should develop more rapidly than the first.

The Secretary of State made it quite clear that the binary system was preferred to the unitary system hierarchically arranged on the 'ladder' principle with the universities at the top and the other institutions down below. Such a system, he stated, "would be characterised by a continuous rat-race to reach the first or university division"—"and must inevitably depress and degrade both morale and standards in the non-university sector".

Sir Lionel Russell,<sup>(5)</sup> in his address to the Association of Technical Institutes in January 1966, said that the above statement might indeed be so, but—it would also be possible for a binary system to consist of a first division and a second division. This was not what was envisaged, but—two parallel divisions

both of very high standing and recognised by students, by parents and by schools as such.

To achieve such an objective, both divisions would need to attract good staff, have similar conditions of service and equal academic status for equal duties and responsibilities.

There was an ever increasing need and demand for vocational, professional and industrially-based courses in higher education, in which the underlying assumption is "that the student's primary motivation is the profession he intends to follow". He is committed to a profession from the outset and his course of study is closely integrated with his professional work, i.e., students who are more interested in applying knowledge to the solution of problems than in pursuing learning for its own sake.

In 1955, to administer awards of higher prestige, the National Council for Technological Awards was established. This had considerable influence upon major technical colleges. So much so, that the 1963 Robbins Report recommended that it be replaced by Royal Charter. The Council has powers to award degrees and other academic qualifications, comparable in standard with those granted by universities, to students who complete approved courses of study or research in educational establishments other than universities.

This Council is engaged in administering awards. It is for the individual colleges to devise the courses needed by industry, business and the professions, and to plan the curricula and the syllabuses.

The need was also recognised not only at full-time degree level, but also at full-time just below degree level, at part-time advanced level, and so on. The polytechnics were to meet the demands of the thousands of young people who will occupy the all important intermediate posts in industry, business and the professions—the high level technical and middle managers who must support the scientists, technologists and top-managers in a modern community. As Sir Lionel Russell

says, "the latter are wasted and lost without their support".

Some indication of the British Government's planning is shown by the fact that an increase of 58 percent in the expenditure on Further Education was recommended, i.e., from £149 million in 1964/65 to £235 million in 1969/70.

Dr Phillip Law,<sup>(2)</sup> in an address "Tertiary Education at Two Levels" to be given this month, states that the binary system advocates the sorting of students into two types—those with analytical minds (liberal motivation) and those with practical minds (vocational motivation).

If there were two such distinct types of students, and if some effective means could be devised to sort them out and "stream" them in two directions, then one could envisage those with love of scholarship for its own sake proceeding to the universities, and those with the "practical minds" intent upon a vocational training proceeding to Colleges of Advanced Education.

If steps were taken to organise our tertiary education in this fashion, the first result would be a severe reduction in university enrolments and a great increase in those at colleges. From Dr Law's observations, large numbers of students from the top intelligence bracket are motivated towards vocational ends. It is important to remember that even if one were to consider "streaming" students into "liberal" and "vocational" directions, one must *not* make the mistake of equating the liberal group with the highest intelligence bracket, and the vocational group with a somewhat lower intelligence level.

Sir Ronald Gould,<sup>(6)</sup> addressing the International Seminar of the World Confederation of Organisations of the Teaching Profession held in Hamilton this month on the subject "Equalities of Opportunity Through Education", said he "deplored hard-dying beliefs that children could be categorised into the intelligent, those good with their hands, and a third group which comprised the back-bone of the nation".

"Excellence was required in all fields. Today's society required not only people of academic ability, but people who were excellent cooks, technicians, motor mechanics and so on", he said.

Such a discussion could be carried on indefinitely, so we will leave this problem of the "conflict of the intellects" because it will raise its head again when we discuss the opportunities for education in the seventies as it relates to the Australian and New Zealand scenes.

### The Development Plan for Australia

Sir Ian Wark,<sup>(7)</sup> Chairman of the Australian Commonwealth Advisory Committee on Advanced Education (CACAE), in a seminar to the Association of University Teachers of New Zealand held in May 1968, summarised the Australian scene as regards Colleges of Advanced Education (CAE's).

In Australia, the CAE's operate at the tertiary level, and in their higher courses they operate at the same level as do the universities, i.e., they complement and sometimes overlap the activities of the universities.

In Australia the responsibility for education lies with the six states, and only in the Federal Capital Territory, the Northern Territory and New Guinea has the Commonwealth a direct responsibility. However, by agreement, the Commonwealth is empowered to make grants to States for particular purposes, and it has done so over the last ten years quite freely with respect to education.

University education in Australia in the late fifties was recognised by the community to be, as a whole, in a parlous condition due to the large number of school leavers who desired to continue their studies, and to the fact that the universities were determined, rightly so, to expand post-graduate activities.

Dr Wark stated that within the universities the emphasis has steadily shifted towards scholarship and research rather than towards training for vocation—a world-wide trend. He quotes the aims of a university as enunci-

ated by the Vice-Chancellor of Melbourne University, Professor David Denham, as published (in *Melbourne Graduate—Monthly Newsletter*, March 1968)—

“The aims of a university are different from those of other kinds of educational institutions whose aims are of a strictly vocational kind. A vocational training school, however high its standards, however high its intellectual demands—and these are often higher than those of the university undergraduate courses—has different kinds of aims. It aims to equip its students to do particular jobs, known beforehand, and the courses are designed to turn out the students as competent workers in the job required.

“This is not the role of a university. A university has one of its aims to help students to equip themselves to understand life in the community around them, and to face life in the best way with appreciation and sensibility . . .

“We are not here to turn out people equipped to step into particular jobs. We are here to provide higher education so that people can choose where they can go in life to achieve their greatest happiness and achievements . . .

“Nearly half of the university’s effort and ambitions go into research. Ultimately this is the work which produces the material on which you are expected to work during your under-graduate course. If there is an external work of a university, it is the continued production of original work and the acquisition of new knowledge”.

In Melbourne, The Royal Melbourne Institute of Technology gives a more liberal education in science than that received by the honours students in the University of Melbourne who need study only mathematics, physics and chemistry.

Australia has forty colleges of advanced education (CAE’s) with 40,000 or so students at tertiary level. These constitute a highly developed and rapidly expanding

section of the educational spectrum, e.g., in Victoria three-quarters of all the professional engineers are being trained in the major technical colleges. The standards of the top-level courses in these colleges are set at about the same level as prescribed for a pass degree in a university; and the professional institutes, notably the Chemists and the Engineers, have admitted the graduates from colleges to full membership.

During the early years of operation of the Australian Universities Commission, the CAE’s had a very thin time, e.g., from 1947 to 1962, while the percentage of students on technical courses having some tertiary content rose from 34 to 37 percent of the total of all tertiary students, the share of the overall budget to support them fell from 12 to 7 percent.

Sir Robert Menzies, in 1961, set up a committee under the Chairmanship of Sir Leslie Martin, to advise on the whole field of tertiary education in Australia, including both universities and colleges. This committee came out strongly in favour of the binary system of tertiary education as discussed earlier, and adopted freely on the Continent of Europe.

Among its recommendations was one that there should be set up in each state an Institute of Colleges, through which might be channelled appropriate claims from the individual colleges to the State Government for matching grants from the Commonwealth. But the Institutes would do more than this; they would develop and co-ordinate technical and other non-university tertiary education.

The Commonwealth Government accepted many of the recommendations of the Martin Committee, but instead of setting up a comprehensive commission to advise it with respect to all tertiary education, it decided, while leaving the Australian Universities Commission intact, to set up a second committee for the colleges—the Commonwealth Advisory Committee on Advanced Education—of which Sir Ian Wark is Chairman.

The Commonwealth set up guide lines for colleges that must be met to attract Commonwealth grants. Sir Robert Menzies' speech outlining his concept of education in these new types of colleges is given in Appendix I.

Menzies stressed that these new type institutions should "resist the temptation to copy the educational processes and curricula of universities"—the responsibilities of the colleges to the community are "of a different kind" from those of universities—"these colleges we see are designed primarily for teaching at the tertiary level and as catering for the diploma, not the post-diploma student".

Sir Ian Wark suspected that the last statement was in part due to the failure to realise that some colleges were already set at a level matching those of pass degrees. So in 1968, the Commonwealth Government agreed that the Victorian College of Pharmacy could award a degree of pharmacy without loss of grants to the college.

Because of the differing levels of courses for diplomas, the Commonwealth Advisory Committee on Advanced Education recommended the setting up of a Committee of Inquiry into standards and awards in the colleges. From this it was hoped a National Accrediting Council would be established.

Meanwhile, the Commonwealth agreed to support post-diploma courses which require one year's additional study for a higher diploma, making four years study in all. One of the main pitfalls to be avoided, it was pointed out, was to attempt to train to the very highest levels all those who are capable of reaching matriculation level.

In Australia it is not the intention of the Commonwealth, nor of the States, to encourage colleges to operate only at a level to be equated with university pass courses, nor to up-grade courses now fulfilling a useful function. For one technologist there are required somewhere between *two* and *ten* technicians, some of whom will need to be trained well beyond the level of secondary schooling, though not to the level of the highest awards of the colleges.

The Australian Colleges of Advanced Education are expected to concentrate on two main levels, the certificate level for technicians (normally two full-time years beyond secondary school training) and the diploma level for *technologists* (which in certain instances may be equated with the degree level). The latter would require at least three years of full-time study beyond school leaving, or equivalent part-time or sandwich-type study.

The CACAE also strongly urged against the setting up of single purpose colleges, e.g., a Conservatorium of Music, or a School of Pharmacy, and favoured the polytechnic-type of college. Sir Ian Wark urged New Zealand not to try to do everything everywhere, but to settle, in the first instance, for one or two first-rate polytechnic-type colleges.

In Australia about *one-quarter* of all the tertiary students in the Commonwealth are in the colleges, and *two-thirds* in the universities. The remainder are mostly teacher trainees. In the future this trend could be reversed. For the first time the colleges are being provided with sites and buildings to match the universities; the staffs are winning justice with regard to salaries and working conditions; and, most important of all, sectors of industry and commerce and Government departments are coming to prefer graduates from the colleges for many of their jobs.

Australians looking at the situation in Great Britain saw a dozen Colleges of Advanced Technology granted university status. Then to overcome the vacuum so created, the Government decided as a matter of policy, to back the polytechnics, but apparently half-heartedly. The polytechnics then sought university status. This tragedy could have been avoided, the Australians felt, had the staffs of the CATS and polytechnics been accorded the genuine esteem that was their due, by providing first-rate facilities and amenities for staff and students, as aimed at in Australia.

In Australia, as in England, there are three types of tertiary educational institutions

concerned with vocational education—Universities, CAE's and Teachers' Colleges. But, as Phillip Law<sup>(2)</sup> points out, there is no point in attempting to define *philosophical* differences between these three as centres for *vocational* training. They provide various ribs of a broad "fan" of tertiary educational opportunities that must be diverse in nature if they are to satisfy both the spread and interests amongst individuals, and the demands of our complex society. Unless vocational training is to be removed completely from universities, any suggestion of a "binary" system of tertiary education is absurd.

On 2 June 1968, the Commonwealth Minister for Education and Science announced the setting up of a Committee of Inquiry into Awards in Colleges of Advanced Education under the Chairmanship of Dr F. M. Wiltshire. A report on Academic Awards in Advanced Education<sup>(8)</sup> was presented to the Minister for Education and Science on 12 June 1969.

The Committee felt that serious consideration of awards in the field of advanced education could only be undertaken satisfactorily on the basis of a definitive statement of the purpose of colleges of advanced education.

They concluded that these colleges exist to provide vocational education at the tertiary level—vocational education here meaning preparation for work in industry, commerce and the public service, with due regard to the country's current needs and foreseeable future requirements.

The Committee stated that community acceptance of the colleges will depend on the extent to which their courses serve the purpose for which they are designed, and the effectiveness with which successful students can cope with the work situation for which they have been prepared. In this connection, the Committee emphasises that it would be a serious matter if a course serving a useful community need were to be replaced by one requiring a higher level of intellectual effort or a longer period of time, simply because of

a desire to achieve greater status. *Further, it did not accept the argument that the desire to achieve greater status in the eyes of the community justifies the introduction of any particular nomenclature of awards, such as a degree, for this reason alone.*

The Wiltshire Report concluded that conformity in nomenclature of awards in colleges of advanced education was desirable, and that a major step to achieve conformity would be taken by setting up a competent national body concerned with academic awards in advanced education.

Criteria were established for broad categories of courses at various levels in CAE's, and on this basis a system of awards was recommended. Considerable discussion took place on the value of the terms "diploma" and "degrees", and it was concluded that in contrast to the term diploma, the term "degree" is commonly understood to refer to a tertiary qualification and is readily accepted as such by the community. It carries with it an assurance of acceptable standards. The "degree" has wide acceptance as a reputable qualification at tertiary level, and possession of a degree normally gives entry to the professional ranks in most disciplinary areas.

There was little support for the argument *that degrees should be offered only in universities*, and the Committee agreed that in appropriate circumstances the award of degrees in colleges is justified, provided always that adequate safeguards are maintained with respect to quality—the large majority of senior academic staff and administrators in universities with whom the matter was discussed at length, supported this view.

The Committee doubted the validity of the argument that the introduction of degrees as awards would cause the colleges to raise their standards to unduly high levels. Rather, this might occur because of the absence of the opportunity to use degrees, if the colleges were to raise academic standards in an endeavour to demonstrate, beyond all possible doubt, the academic quality of their courses

as compared with others using the degree nomenclature.

They recommended that:

the system of nomenclature of awards in colleges of advanced education be based on the term "diploma" and "degree" and that in the case of degrees a distinctive style of nomenclature be employed in general different from that offered in Australian universities.

The report places courses into various categories—

(1) Courses Leading to a First Qualification:

Category A—A course in Advanced Education—bachelor's degree. For the award of the bachelor's degrees for courses in Category A, which follow the completion of three years' full-time study or part-time equivalent.

Bachelor of Technology—

B.Tech(\*)

Bachelor of Applied Science—

B.App.Sc.(\*)

Bachelor of Business Studies—

B.Bus.S.(\*)

\* abbreviation for disciplinary area.

Category B—

B.-1 Advanced Diploma in \*

B.2 Diploma in \*

(2) Courses Leading to a Higher Qualification:

Category C—Courses in Category C will be short courses which will follow the completion of first courses, either immediately or after the passage of time.

C.1 Diploma in \*

C.2 Honours level to be discussed by the National Accrediting Council.

Category D—It is anticipated that courses in Category D will attract graduates both from the Colleges of Advanced Education and from the Universities.

For the award of master's degrees for courses in Category D which follow the completion of two years' full-time study, or part-time equivalent, subsequent to the completion

of a degree course of three years' duration in a College of Advanced Education or in a University.

Master of Technology—

M.Tech(\*)

Master of Applied Science—

M.App.Sc.(\*)

Master of Business Studies—

M.Bus.S.(\*)

\* disciplinary area.

Finally, an Australian Council for Accreditation of Awards in Advanced Education was recommended.

### The New Zealand Situation

Mr B. W. Potter, Principal of the Wellington Polytechnic, in an address to the N.Z. College of Education in August 1969, stated that "Technical Education enters the nineteen-seventies with justifiable pride in the achievement of the past decade. Public esteem is still a matter of major concern—vocational educators still lack academic respectability, a hangover from the Platonic Philosophy which held that all useful activity was a pursuit fitting for a slave".

In that same address he said "the Minister's statement in June 1969 that re-appraisal had been made on the establishment of the Central Institute of Technology, and approved with the assurance of reasonable safeguards to protect regional technical institute interests was an adequate anti-pyretic to the fever that beset us and calm should now prevail as we adjust ourselves to a situation that will shape significantly the form of technical education in New Zealand for many years".

In these words was closed one of the most controversial periods of development in Technical Institutes in New Zealand. It stopped, perhaps for many years, the multifarious development without viable units within technical institutes—a problem so prevalent in university development today, where student intake at times seems more important than academic excellence.

Recently in the *Evening Post*, a tribute was paid to the architect of technical develop-

ment in New Zealand over the last 21 years, Dr B. C. Lee, Director of Technical Education. Dr Lee retires in October. He has seen technical education grow from relatively small beginnings to a service which employs 1,000 teachers, and which has been accepted by the public as a new type of tertiary education.

Dr Lee said "At present the standard of our courses is good, but I am still not satisfied that enough young people, who could benefit from the courses, are using them".

He also said "that it was clear that if the National Development Conference (NDC) recommendations were followed, there would be more courses in technical institutes comparable in level to a university degree, but with greater stress on application to industry and commerce, and more cross-disciplinary courses. There will also be an extension of trade training in technical institutes".

The Tyndall Report (1965) set the stage for two acts that should have a profound effect on technical education at the non-professional level—the Technicians Training Act 1967, which gives legal recognition and protection to the technician cadet; the Vocational Training Council Act 1968 set up in July 1969 the Vocational Training Council (VTC) with a Chief Executive Officer, Mr R. C. Stuart, and strong supporting staff.

The N.D.C. predicted that the technical institutes will absorb \$20 million of the educational vote by 1979; the 1968 figures and the 1978 predicted figures for numbers of students and estimates are given below:

	1968		1978	
	Roll x 10 <sup>3</sup>	\$ x 10 <sup>6</sup>	Roll x 10 <sup>3</sup>	\$ x 10 <sup>6</sup>
Primary State	456.0	68.8	527.0	168.8
Secondary State	153.0	40.5	216.0	78.8
Universities	26.8	36.2	47.2	86.0
Teachers' Colleges	6.1	11.9	11.7	23.8
Technical Institutes	9.0*	5.6	16.0*	24.3
	650.9	163.0	817.9	381.7
	* equivalent full-time			
Independent Primary	53.8		52.0	
Independent Secondary	27.0		38.9	

Much of what is going to happen in educational matters over the next few years can be gauged by the guide-lines laid down in the Education, Training and Research Committee's Report to the National Development Conference.

I have mentioned already the V.T.C. Another is the Advisory Committee on Educational Planning (A.C.E.P.). Already much of what the N.D.C. Committee considered as important is being studied. For instance, in the recommendation of the V.T.C., a pilot scheme providing for long "blocks" of 18 weeks full-time study at technical institutes is to be introduced shortly for apprentices in their first year of apprenticeship.

The A.C.E.P. is also actively studying the N.D.C. recommendation that a high level award-giving body be established to provide for national recognition of 3-4 years' full-time courses undertaken outside the university system.

I have referred briefly to technical developments in Great Britain and Australia, but what are the present arrangements regarding the technical institute system of education within New Zealand?

There are technical institutes in Auckland (Auckland Technical Institute and a small satellite institute at Manakau), Hamilton (Waikato Technical Institute), Wellington (Wellington Polytechnic), Christchurch (Christchurch Technical Institute), Dunedin (Otago Polytechnic), each of which is known as a "regional" technical institute. In Wellington there are the Technical Correspondence Institute and the Central Institute of Technology (C.I.T.) which are "national" institutes. Each institute is involved in varying degrees with studies in three main categories: trades, technician and other, including professional courses. The C.I.T. at the present time is involved to the extent of about 30 percent of its load in Trades training, 50 percent in Technician studies and the remainder distributed over such studies as Pharmacy, Chiropody, Accountancy and Management and Tutor training.

Mr J. A. Bateman,<sup>(10)</sup> the Principal of the C.I.T., addressing the N.Z. Association of Economists recently, defined a technician as a "person employed in industry or commerce who is an expert in applying specific techniques associated with science or technology".

The N.Z. Technicians' Certificate Authority is responsible for the preparation of syllabuses and the supervision of examinations, the fields of study covering broadly—engineering, building, science and commerce. Many of our technicians today are holders of the N.Z. Certificate in Science or Engineering. The fifth year of study for a N.Z.C. has been regarded as of about Stage 1½-2 of a university degree course. From Year 3, students undertaking these courses must be in some suitable employment. Some credits are available to technicians who on graduation wish to further their studies in the university system.

Mr B. W. Potter<sup>(9)</sup> points out that only about one-third of the N.Z.C. holders take advantage of the dispensation offered them. For two-thirds the N.Z.C. is obviously a satisfactory terminal qualification.

In 1968 352 students completed N.Z.C. and 42 enrolled into the university. To show the standard of the N.Z.C., 82 percent of students who enrolled for university study prior to 1968 have already passed Bachelor degrees. However, in New Zealand the ratio of Professional Engineers to Engineering Technicians is approximately 1:2, but the output is approximately equal. This almost automatic elevation of more than 10 percent of the technician output to professional status creates only further imbalance.

When we look at the situation in the sciences for the future supply of technicians, the situation is far from good. Although we can see the universities supplying ample graduates, there will be a serious shortage of fully trained technicians, by a factor of about 2. The accumulated output of T.C.A. certificate holders will be only about 1,300 by 1979, whereas the need will be at least twice this number.

Most scientists in charge of scientific developments today are, on account of the shortage of technician staff, unable to provide adequate supporting staff for their highly trained scientists. This is causing dissatisfaction amongst scientists, is an uneconomic and wasteful use of trained manpower, and is not in the interests of the economic aims of the N.D.C.

The aims of university education will not, and maybe should not, meet the challenge within the laboratories. Not until there is a radical change of heart within the *public* to the realisation of the potential lying within the development of tertiary non-university education, can the future expansion of this country be assured.

Great local pressure has been exerted to ensure an expansion of the system. In Palmerston North the first "area institute", as recommended by the N.D.C. Committee, will open next year. So the base of the pyramid of technical education will widen, and with the decision taken to build a new institute at C.I.T. divorced of trade training and devoted to technician and professional full-time courses, a complete and complex structure will emerge.

Such an Institute in the Australian context would be known as a 'College of Advanced Education', and in the British setting as a 'Polytechnic' (i.e., catering for senior level technician studies and full-time professional courses). "Should this Institute develop, as have these overseas counterparts, New Zealand would need to adjust itself to many novel facets", said Mr Bateman, in his previously quoted address. In both the United Kingdom and Australia, these non-university institutions offer courses leading to both the award of diplomas and degrees and have established the necessary National Academic Awarding Authorities. It is greatly to the credit of the universities that they have participated fully in the detailed planning required to establish such bodies as the C.N.A.A.

Industry in Britain has the choice of graduates trained in two different environments for equivalent positions in the work force. Both types are eagerly sought, for in the one case industry obtains a graduate of immediate real value, while the university graduate may take a year or two to be of practical value to his employer. It is likely that the distinctions occurring because of background will disappear in a few years when, through subject obsolescence, some formalised re-training may be essential. This re-training is a prime function of an institute of technology, as we train and will be re-trained, for the complex systems, and decisions which today make up our society.

Society needs these two systems with overlapping objectives and interests, because the community they serve is a complex organism. Our universities are concerned with vocational as well as liberal education, evidenced by such traditional studies as law, medicine, commerce, dentistry, education, architecture and so on. But, do we want our universities to become the multi-varsities of the American type, or would it not be better to ensure public recognition of the institutes and the universities as two types of institutions, forming separate elements of a unitary system of education? The base of the university pyramid should be the degree—the apex, post-doctoral research. The technical institute pyramid establishes its wide base in the vast area of trades training and tapers through technician training, ultimately overlapping at its apex with the university degree structure. The future, as we move through the seventies, will decide such issues.

Finally, let me conclude with a viewpoint from industry as to the training of chemists in New Zealand. Industry develops, produces and distributes, and each of these functions requires the application of sound scientific principles and techniques in which the chemist can play a major role. Industrial chemistry differs from pure research, essentially in that the latter is aimed to provide, and publish, knowledge for its own sake. The

chemistry in industry is aimed towards a more specific purpose, investigation projects tend to be short-to-medium-term, but publishable nevertheless.

It is said that although many chemists have found successful and rewarding careers in industry, the present university graduate is ill-prepared for such a role and soon becomes frustrated.

Industry, some say, is the place for those who can't maintain the academic race. The graduate has been trained to think so narrowly and constrainedly, that he has lost constructive thought, an axiom of this age; the environment of industry is so strange from the world of his research with all those exalted aims, that he has lost the art of communicating, after years of a 'language' the workers can't reiterate.

And finally—

Along comes an upstart, no training had he,  
But a certificate they call the N.Z.C.E.  
This fellow they say, is worth a degree,  
A technical one, mind you, not the B.E.  
Then both of them find, while not the same  
at the start,  
As life's race progresses they can each play  
a part.  
The one is for industry, the other's for art,  
So culture and knowledge bring peace to  
the staff.  
New Zealand's a land of strikes and fears,  
As the E.E.C. threatens to cut off our ears.  
But if "U" and "non-U" would only combine,  
There's no doubt of prosperity in the full-  
ness of time.

### Appendix I

Sir Robert Menzies speech as printed in *Hansard*:

"I turn now to consider the new concept which is the heart of this report. It is that Australia, during the next decade, should develop advanced education in virtually new types of colleges. These colleges would provide for those students who, though qualified, do not wish to undertake a full uni-

versity course, or whose chosen course is not considered appropriate for a university, or whose level at passing matriculation indicated a small chance of graduation from a university in minimum time or minimum time plus one year. The recommendation for the development of these colleges and the recommendation that new universities should not be established—honourable members will see this in the report—taken together with other observations of the Committee, indicate a belief on its part that universities should grant entrance only to those matriculants whose standard of pass was good enough to indicate a reasonable likelihood of graduation in minimum time or minimum time plus one year.

“The Committee suggests that the new colleges, to give advanced education, should be developed from, and around, the existing tertiary segments of existing technical colleges. But it is clear that what is envisaged is not merely a bigger and better college for teaching technical subjects, for the suggestion is that technology should be only one of the education fields in which these colleges should provide advanced instruction. In them there should be, says the Committee, appropriate courses in the liberal arts for “young men and women taking up administrative positions in commerce, industry, and government”. There should be a common core of studies at tertiary level aimed at providing for all students attending the college “breadth in education”, and the development of “critical imagination and creative abilities”. Students engaged in such common studies would major in technological courses or in other courses provided by the colleges to fit them for particular careers after they had gained their diploma. . . .

“Commonwealth financial support for these colleges will be confined to capital and recurrent expenses for the development of tertiary education only, and we define tertiary education as consisting of courses before entry upon which a student must pass matriculation or an equivalent examination. And it will be confined to assistance for strengthen-

ing, and expanding, and introducing, diploma courses. We have noted the Committee’s suggestion that at some time in the future the new Institutes of Colleges that it envisages may build on present proposals in order to provide post-diploma courses leading to degrees. But the support now pledged by the Commonwealth will not go beyond supporting the basic concept of the Committee as to new type colleges with a variety of advanced courses leading on completion to a diploma. We wish to emphasise this point, Mr Speaker, for we entirely agree with the Committee’s statements that these new type institutions should “resist the temptation to copy the educational processes and curricula of universities” and that the responsibilities of these colleges to the community are “of a different kind” from those of universities. Our support is founded on acceptance of this principle, and we do not make our support available for the development out of these colleges of new universities. We do not look so far ahead as that. We see these colleges as designed primarily for teaching at the tertiary level and as catering for the diploma not the post-diploma student”.

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## PRESIDENT 1970-71



Dr W. A. McGillivray, the Institute's new President, is the Director of the New Zealand Dairy Research Institute, the largest of the research institutes. Following secondary education at Mount Albert Grammar, he studied chemistry at Auckland University, and served for a period in the RNZAF after graduation. In 1946 he joined the staff of the then Massey Agricultural College, where he lectured in biochemistry. He was Head of the Biochemistry Department of the College at the time of his transfer to the Dairy Research Institute as Chief Bacteriologist in 1959, subsequently being appointed Assistant Director, and taking over as Director from Dr F. H. McDowall in 1965.

In 1947 Dr McGillivray was awarded a University Fellowship, and in 1953 spent a year working at the University of Reading, England, as a Nuffield Fellow. Since that time he has been honoured with the award of the New Zealand Institute of Chemistry Industrial Essay Prize, the Morcom-Green

and Edwards Prize, the I.C.I. Prize, and the Association of Scientists Science Medal. Dr McGillivray has been active in numerous scientific societies including the New Zealand Dairy Science Association, the New Zealand Nutrition Society and the Institute of Chemistry. He was elected an Associate of the latter in 1944 and Fellow in 1952. He is a past Chairman of the Manawatu Branch, has served on various Committees of the Institute, and was Editor of the Journal from 1955-1960. In 1966 he accepted a position as foundation Editor of the Journal of the New Zealand Society of Dairy Science and Technology, a position which he still holds. This latter Journal has proved most successful, both in New Zealand and overseas. Apart from his scientific interests, Dr McGillivray has wide-ranging interests in related spheres. He has served as a member of the Palmerston North High Schools Board of Governors, and has been a member of the Massey University Council since 1962.

As Director of the Dairy Research Institute, Dr McGillivray has been responsible for a considerable expansion in both the numerical strength of the staff (150) and in the range of topics covered. This has partly arisen from an attempt to meet the challenge posed by the possibility of Britain's entry into the EEC; and has been a signal success with the development of new products to meet the specific requirements of new and developing markets. Dr McGillivray and his team deserve a significant proportion of the credit for the rapid expansion of dairy product sales in countries which have not traditionally been purchasers of dairy products.

## INSTITUTE OFFICERS 1970-71

FIRST VICE-PRESIDENT: K. E. SEAL

SECOND VICE-PRESIDENT: PROFESSOR R. E. CORBETT

## BRANCH CHAIRMEN

## AUCKLAND



Mr **John C. Hawthorn** was educated at Whangarei High School and the University of Auckland, where he graduated M.Sc. in 1960. In 1969 he was awarded the post-graduate Diploma in Business and Industrial Administration.

Mr Hawthorn joined Formica (N.Z.) Ltd. in 1960 as Industrial Chemist. He became Technical Manager in 1962, Works Manager in 1964 and General Manager for New Zealand in 1970. He is a member of the New Zealand Institute of Management, and Secretary of the Industrial Committee of the Papakura and Districts Chamber of Commerce. John Hawthorn is married with three children and plays hockey for the Papakura club.

## WAIKATO



Mr **R. J. Lancaster** graduated M.Sc. (Hons. Chem.) from Victoria University College in 1936. He joined the Chemistry Section of the Department of Agriculture in 1936, and after two years working on soils at the Fairlie Terrace laboratory was seconded to Lincoln College to work on pasture herbage. This was suspended during three years Air Force Service, and in 1945 Mr Lancaster was transferred with the remainder of the Chemistry Section to the newly formed Ruakura Research Station.

Here his work centred on ruminant nutrition—particularly the measurement of herbage intake by the grazing animal. During the last 15 years he has worked mainly on silage fermentation and the evaluation of conserved feeds.

## MANAWATU



**Dr P. S. Robertson** has, since 1967, been Assistant Director of the New Zealand Dairy Research Institute. He was educated at Wellington College and at Canterbury University College, graduating M.Sc. (in 1952) from the Chemistry Department following completion of a thesis on Derivatives of the Hydrogen Cyanide Tetramer: Structure and Chemistry. He then joined the Bacteriology Department of the Institute. After investigating a number of problems related to the manufacture and ripening of cheese he set up and operated a small Institute substation in the United Kingdom for a period of 3 years and, at the same time, completed a Ph.D. at the University of Reading on comparative studies on Cheddar cheese from four countries. After his return to New Zealand in 1961 he undertook a number of studies related to improvements in the manufacture of cheese and was appointed Chief Bacteriologist in 1965. He is widely known for his part in the work leading to the Vatmaster, Cheddarmaster, Pressmaster and Large Hoop system of mechanised cheesemaking. For this and other work Dr Robertson was awarded, in 1969, the New Zealand Association of Scientists first Special Research Medal.

## WELLINGTON

**Mr C. L. H. Stonyer** received his secondary education at Timaru Boys' High School, and commenced his chemical career as a lab. boy at Davis Gelatine Ltd., in Christchurch. After obtaining a B.Sc. from Canterbury University College in 1940, he worked in the Australian Commonwealth explosive factories, and spent the war years in Melbourne, Ballarat and Adelaide.

Returning to New Zealand in 1945 he took up a position in the Vacuum (now Mobil) Oil Company laboratory, and moved to their Sales Department in 1958 for two years. He then spent a brief period as plant manager of a paint and chemical manufacturing company, a subsidiary company of his present employer Tasman Vaccine Laboratory Ltd., where he has the position of industrial chemist.

He became an Associate of the Institute in 1946 and in addition to his chemical qualifications, he became an Associate of the Institute of Management and received the Diploma of Industrial Administration.

At one time, as a foundation member of the Wellington Home Builders' Co-operative Society, he was interested in amateur house-building, and he is active in home landscaping and gardening. He has also taken part in backstage activity associated with amateur dramatics in the Wellington area.



## CHRISTCHURCH



**Dr B. R. Mann** was educated at St. Bede's College, Christchurch, and at Canterbury University College. He graduated M.Sc. with second class honours in Chemistry in 1959, and carried on to gain his Ph.D. in 1962 working on reaction mechanisms of organic compounds under very high pressures.

In 1961 he joined the leather industry with E. L. Bowron & Co. Ltd. as a research chemist and began research of development work in both leather and woolskins. He now holds the positions of Factory Manager and Technical Director of E. L. Bowron & Co. He was elected an Associate of the Institute in 1962 and a Fellow in 1968.

## OTAGO

**Dr J. G. Blackman**, M.Sc., Ph.D.(N.Z.), was born in Dunedin and educated at Otago Boys' High School and the University of Otago. He graduated M.Sc. (Hons. in chemistry) in 1953 and, after a year in industry, joined the Department of Medicine as Assistant Lecturer in Pharmacology. For his doctorate he studied the pharmacology of substances which lower blood pressure. In 1959 he was awarded an I.C.I. Research Fellowship at Edinburgh University where, in the Department of Pharmacology under Professor W. L. M. Perry, he commenced work on the pharmacology of the neuromuscular junction and collaborated with Dr B. L. Ginsborg on electrophysiological studies of transmission in the autonomic nervous system. In 1962 he was appointed Senior Lecturer in the newly formed Department of Pharmacology at Otago University, where he set up an electrophysiological laboratory to continue research on transmission processes in the nervous system. A side interest has been the pharmacology of the New Zealand treenettle, *Urtica ferox*. This year he was appointed Associate Professor.

Dr Blackman is married with three children. He enjoys painting and has published, in collaboration with the architect E. J. McCoy, a book of photographs of Dunedin's earlier buildings.



## BRANCH COMMITTEES 1970-71

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ards, Dr I. L. Weatherall, Dr A. G. Wil-  
liams.  
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*Hon. Treasurer:* Dr G. W. Emerson.  
*Committee:* J. Salinger, Dr G. F. Laws, and  
one to be elected.  
*Delegate:* Prof. G. B. Peterson.  
*Branch Editor:* Prof. D. J. Brasch.  
*Hon. Auditor:* T. A. Thomson.

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## NOTICE OF PRIZES

### THE CHEMICAL ESSAY PRIZE REGULATIONS

1. The New Zealand Institute of Chemistry shall offer annually a prize for an essay or review on a chemical topic.
2. The prize shall be open to anyone who has not attained the age of 25 years before 30 April in the year of the contest, whether a member of the Institute or not.  
(Note: Entries from students will be welcomed).
3. The entry shall be not longer than 5,000 words.
4. The entry shall be in a form suitable for publication, and the Institute shall have the right to publish the winning entry.
5. 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.
6. 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-officio members of this Committee.
7. 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.
8. 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.
9. 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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### CHEESEMAN - POND PRIZE

The Council of the Auckland Institute and Museum invites entries for the Cheeseman-Pond Memorial Prize for award in 1971.

The prize, founded through a bequest from Mr J. A. Pond in commemoration of his friend Thomas F. Cheeseman, F.L.S., F.R.S.N.Z., will take the form of scientific books or scientific instruments suitably inscribed to the value of \$40, and shall be open for competition among members of a Branch of the Royal Society of New Zealand or of an institution affiliated thereto or graduates or undergraduates of the Universities.

The prize will be awarded for the most meritorious paper or papers prepared and

actually published by the candidate during the period 1 January 1966 to 31 December 1970 in any of the subjects—Physics, Chemistry, Geology, Palaeontology, Botany or Zoology. No candidate shall be eligible for the prize if prior to 1 January 1966 he or she has published the result of any scientific research.

Candidates shall on or before 31 March 1971 give notice to the Director of candidature and at the same time submit two copies of the publication or publications offered for the purposes of the competition.

E. G. TURBOTT, *Director*.

## BRANCH NOTES

### Auckland

#### *Annual Report of Branch*

Ten branch meetings were held during the year, five of them in association with other societies. Average attendance was 50 (42 in 1969) and there has been a steady increase in recent years. Branch membership increased by 29 to 278, making Auckland the largest branch for the first time. An analysis of the membership according to employment shows the following order: Industry 46%, University 22%, Schools 8%, Government 8%, Hospitals 5%, other 16%.

#### *Recent Meetings*

The Branch was addressed by Dr. M. Spiro, Visiting Mellor Professor, University of Otago, on *Some Modern Aspects of Electrochemistry*. Dr. Spiro covered a broad range of recent developments in Electrochemistry ranging from fuel cells and organic synthesis to the production of surface alloys of unusual properties.

The Annual General meeting was held on 29th October in conjunction with cocktails and a buffet dinner at the Berkeley Lounge, Mission Bay.

#### *Personal*

Dr. K. M. Baker has completed a research fellowship at Cambridge University and is on leave in Auckland before taking up employment with Syntex Corp. at Stanford, California.

Mr. A. C. Kennett and Dr. G. A. Wright were New Zealand delegates to the Australasian Corrosion Conference in Newcastle in November.

Dr. J. E. Packer, Mr. R. F. Anderson and Mr. J. P. Barton attended a Conference on Radiation Chemistry at Lucas Heights, Australia in October.

### Manawatu

#### *N.Z. Dairy Research Institute*

Dr T. D. Thomas returns to the N.Z.D.R.I. in December after spending twelve months at Queen Elizabeth College, London University, followed by nine months with Professor E. F. Gale at the University of Cambridge. During the last three months he has travelled extensively, visiting laboratories of interest in Europe and North America.

#### *Massey University*

Dr I. D. Watson has moved to Palmerston North to take a senior lectureship in the Department of Chemistry and Biochemistry. Prior to this, he held a post at Otago University.

Dr J. McDougall of the Department of Biotechnology has recently left to travel to Newcastle to spend a year studying factors involved in pollution.

Dr. K. R. Aiyar has recently left the Department of Food Technology to return to India. He is going to Orvall in Southern India to take part in a co-operative community scheme.

### Wellington

#### *Mellor Lecture*

Following the Wellington Branch General Meeting on October 7th, the annual Mellor Lecture was presented by Otago University's Mellor Visiting Professor, Dr. Michael Spiro. Dr. Spiro's lecture dealt with fuel cell development, organic electrosynthesis, and electrolytic surface alloy production.

#### *Institute of Nuclear Sciences*

At the request of the International Atomic Energy Agency, Dr. T. A. Rafter visited Bangkok and other Asian countries in July

and September to lecture on activation analysis and other activities of the Institute. He also lectured at a Geochemistry Conference in Japan during the latter trip.

Dr. B. J. O'Brien returned in August from New York where he has been working on a United Nations survey of radiation doses resulting from nuclear fallout. He visited Geneva in September to report on this work.

The National Electronics Conference at Auckland, on 23-26 August, was attended by Dr. J. R. Hulston, Mr. J. D. McCormick and Mr. K. W. Low. A paper on the use of electronic calculators in mass spectrometer data collection was presented by Dr. Hulston and Mr. Low.

Dr. J. R. Hulston lectured on Data Acquisition and Processing by Computer at the Seminar on Automation in chemical analysis, organised by the Manawatu Branch in July.

#### *Biochemistry Department, V.U.W.*

Dr. F. B. Shorland, Honorary Lecturer in Biochemistry at Victoria University, has recently been awarded a medal by the N.Z. Association of Scientists for outstanding service to science. This award, which was inaugurated in 1969, is intended as recognition of a meritorious contribution to the cause and/or development of science. This year it was decided to award two medals, and one of these was presented to Dr. Shorland. He is a former Director of the D.S.I.R. Food Chemistry Division, and in the past few years he has been actively participating in some 20 scientific committees. His scientific contributions include some 190 papers, mainly in the field of fats research.

Dr. A. G. Clark has recently been appointed to the position of Senior Lecturer in Biochemistry at Victoria University. Dr. Clark obtained his Ph.D. in biochemistry at Victoria and has just returned from London where he was studying mechanisms involved in drug action and detoxication at St. Mary's Hospital Medical School and at the Institute of Psychiatry, where he was lecturing in biochemistry.

#### *Chemistry Department, V.U.W.*

Recent promotions approved by the Victoria University Council included that of Dr. R. W. Hay from Senior Lecturer to Reader. Dr. Hay, who was appointed to the Chemistry Department's staff in 1961, has research interests in the field of mechanisms of metal-ion-catalysed organic reactions.

#### **Canterbury**

Dr. A. Metcalfe and Dr. W. T. Robinson have been promoted to Senior Lecturers in the Chemistry Department, and Dr. R. B. Kee to Reader, and Dr. N. J. Peet to Senior Lecturer in the Department of Chemical Engineering.

Professor Mark Whiting, Professor of Organic Chemistry, University of Bristol, recently spent five weeks in the Chemistry Department as an Erskine Visiting Fellow.

Dr. R. Cole, Chemistry Department, Royal Holloway College, University of London, has arrived to spend a year in the Chemistry Department as Visiting Lecturer.

Professor C. A. Winkler, Professor of Chemistry, McGill University, Montreal, arrived this month to spend seven months' sabbatical leave working with Professor L. F. Philips on some studies on active nitrogen.

Dr Michael Spiro, Reader in Chemistry, Imperial College, London, a graduate of the Chemistry Department, University of Canterbury, who has been Mellor Visiting Professor at Otago University, revisited the department recently and addressed a meeting of the branch on recent developments in electrochemistry.

The September meeting of the branch took the form of a lecture-demonstration on automation in molecular structure determination. Professor B. R. Penfold and Dr. W. T. Robinson demonstrated the use of the automatic single crystal diffractometer and the IBM 360-44 computer in the determination of crystal structure.

Mr. R. V. Roy has been appointed District Senior Inspector of Secondary Schools, Department of Education, Christchurch.

Professor H. F. Halliwell, Professor of Chemical Education, University of East Anglia, spoke to a large gathering of chemistry teachers recently on the teaching of entropy and on developments in the A-level Nuffield scheme in the U.K. His visit to New Zealand was organised by the Institute with financial and other assistance from the Department of Education.

Dr. W. S. Simpson, Head of the Fibre Modification Section of the Wool Research Organisation of New Zealand, Lincoln, is at present in the U.K. spending a year with the International Wool Secretariat Technical Centre, Ilkley, Yorkshire.

The Annual General Meeting of the branch was addressed by Mr. A. W. Mackney, Deputy Managing Director of N.Z. Forest Products Ltd., on "Opportunity in New Zealand."

### Otago

A symposium on Chemical Education was held in Dunedin on 31 October. The Guest Speaker was Professor H. F. Halliwell, Foun-

dation Professor of Chemical Education in the School of Chemical Sciences, University of East Anglia. The symposium, organised by the local branch of the Institute and supported by the Department of Education, attracted many chemistry teachers and university staff. Syllabus changes in secondary schools in the United Kingdom, and the integration of physical and mathematical ideas into the treatment of chemical phenomena, were among the topics covered.

Professor J. R. Robinson, chairman of the Department of Physiology, returned to Dunedin on 20 October after a brief visit to research laboratories in Europe and North America.

Recent promotions in the University of Otago include two Institute members, Dr J. G. Blackman (Pharmacology Department), and Dr R. A. Matheson (Chemistry Department), both of whom are now Associate Professors.

Dr J. C. Dacre, Senior Research Officer, Toxicology Research Unit, Medical School, University of Otago, has been appointed to a position in the Laboratory of Environmental Medicine, Tulane University School of Medicine, New Orleans.

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## THE REGISTRY — 23/8/70

### The following were elected as Fellows:

- FRIEBERG, Alan George, M.Sc.(N.Z.), A.R.I.C., Dairy Laboratory, Dept. of Agriculture, Auckland (Principal Chemist).  
 GOODEY, John Hill, M.Sc., Sonata Laboratories, Auckland (Chief Chemist).  
 MCGIMPSEY, James Raymond, M.Sc., A.M.I. Chem.E., Davis Gelatine N.Z. Ltd., Christchurch (Production Manager).  
 MEREDITH, Peter, M.Sc., Ph.D.(Birm.), Wheat Research Institute, Christchurch (Asst. Director).  
 MILLER, Ronald Bruce, B.A., M.Sc.(Otago), Agr.L.(Sweden), Soil Bureau, D.S.I.R., Lower Hutt (Scientist).  
 SIMPSON, William Stanley, M.Sc.(N.Z.), Ph.D. (Leeds), Wool Research Organisation, Lincoln (Section Leader).

### The following were elected as Associates:

- CHURCHMAN, Gordon John, B.Sc.(Hons.), Ph.D.(Otago), N.Z. Pottery and Ceramics Research Assn., Lower Hutt (Scientist).  
 COCHRANE, Ronald Henry Alexander, M.Sc. (Auck.), Southern Cross Minerals Exploration Ltd., Paeroa (Exploration Manager).  
 DEAN, Ian Christopher, M.Sc.(Auck), Chemistry Dept., Auckland University (Ph.D. Student).  
 FRENCH, Christopher John, B.Sc., Lactose Co. of N.Z. Ltd., Kaponga (Industrial Chemist).  
 GOH, Kuan Meng, M.Agr.Sc., Ph.D.(Illinois), Soil Bureau, D.S.I.R., Lower Hutt (Scientist).  
 HUMPHREYS, Ronald Evan, B.Sc., L.R.I.C., I.C.I. Ltd., Lower Hutt (Research and Development Chemist).

HURRELL, Clyde Owen, B.Agr.Sc.(Dairy Tech.), M.S.(Minnesota), Central Institute of Technology, Petone (Tutor in Pharmaceutical Chemistry).

LEARNAN, Ronald Thomas William, B.Sc., Biological Laboratories Ltd., Auckland (General Manager).

MACKAY, Kenneth Malcolm, B.Sc.(Hons., Aberdeen), Ph.D.(Cantab.), University of Waikato, Hamilton (Reader in Chemistry).

MORRIS, Peter John, M.Sc., Ph.D.(Well.), University of Waikato, Hamilton (Lecturer in Chemistry).

MORRIS, Mrs Patricia Manhire, B.Sc., Avonside Girls' High School, Christchurch (Teacher).

SHAW, Rodney Allenby, B.Sc.(Hons., Sheffield), A.R.I.C., Tasman Vaccine Laboratories, Upper Hutt (Technical Officer).

**The following was re-admitted as an Associate:**

RUSSELL, Mrs Louise Elizabeth, M.Sc., A.R.I.C., 115 Parkvale Road, Wellington (Teacher).

**The following were admitted as Graduate Members:**

BANNERJEE, Panjak, M.Sc. (Kharangpur), Empire Rubber Mills Ltd., Christchurch (Assistant Chemist).

BEAR, Cedric Allan, M.Sc.(Auck.), Chemistry Dept., Auckland University (Ph.D. Student).

BROWN, Kevin Laurie, M.Sc.(Auck.), Chemistry Dept., Auckland University (Ph.D. Student).

DUNCAN, John Roderick, B.Sc., Chemistry Dept., Auckland University (Research Student).

HOGG, Russell William, B.Sc., The Fletcher Plastics Co. Ltd., Auckland (Chief Chemist).

INGHAM, Peter Edward, B.Sc.(Hons., Cantuar.), Wool Research Organisation, Lincoln (Assistant Scientist).

KEITH, David Galloway, B.Sc.(Hons., St. Andrews), Shell Oil N.Z. Ltd., Christchurch (Sales Rep.).

LEWIN, John Francis, B.Sc.(Hons., Cantuar.), Chemistry Division, D.S.I.R., Gracefield (Scientist).

MATTHEWS, Kenneth Murray, B.Sc., Chemistry Dept., Auckland University (Research Student).

MOIR, Colin Harley, B.Sc.(Hons., Cantuar.), Kempthorne Prosser & Co. Ltd., Hornby (Asst. Works Manager).

MURROW, Miss Jennifer Ann, B.E.Chem.(Hons., Cantuar.), Wool Research Organisation, Lincoln (Scientist).

NEWMAN, Roger Huntly, B.Sc.(Hons., Cantuar.), Chemistry Division, D.S.I.R., Gracefield (Scientist).

NORRIS, Rodney John, B.Sc., Chemistry Division, D.S.I.R., Gracefield (Scientist).

OWEN, Maurice Cedric, B.Sc.(Hons., Cantuar.), Biochemistry Unit, Christchurch Hospital (Protein Chemist).

SHARMAN, Wayne Robert, B.Sc. (Hons. Cantuar.), D. J. Haigh & Co., Timaru (Chief Chemist).

SHORT, Stephen Alexander B.Sc., Chemistry Dept., Auckland University (Research Student).

SMITH, Malcolm Gordon, B.Sc., N.Z. Geochemical & Mining Laboratory, Auckland (Chemist).

THOMAS, Warren Keith, B.E. (Chem. Hons.), Abels Ltd., Newmarket, Auckland (Chemical Engineer).

WILLIAMS, David Edward, M.Sc.(Auck.), Dept. of Medicine, Auckland University (Ph.D. Student).

**Resignations:**

Mrs. M. D. Frew, B. D. Gundersen, P. R. Jacobsen, C. J. Masetrs, D. W. Trinder, M. L. G. Walker.

**The deaths of the following members were noted with regret:**

Mrs K. Brown, H. L. Carter, F. Caughley, S. R. J. Cotton, N. L. Edson, D. Fitzsimons, E. D. Pain, A. H. Popplebaum.

**The following were struck off for non-payment of subscription:**

B. F. Anderson, G. B. Engel.

## IUPAC INFORMATION

Information has been received from IUPAC on forthcoming international chemistry symposia as follows:

1. **Symposium on Antibiotics**, St. Marguerite, Quebec, Canada, 1-3 March 1971.
2. **IInd International Conference on Calorimetry and Thermodynamics**, Orono, Maine, U.S.A., 12-14 July 1971.
3. **XXIIIrd International Congress of Pure and Applied Chemistry**, Boston, Massachusetts, U.S.A., 25-30 July 1971.
4. **IUPAC International Congress on Analytical Chemistry**, Kyoto, Japan, 3-7 April 1972.
5. **IVth International Fermentation Symposium**, Kyoto, Japan, 19-25 March 1972.

C. J. WILKINS, Secretary.

## IUPAC PUBLICATIONS

Copies of the following IUPAC publications have been received:

Information publications describing tentative nomenclature rules.

Nomenclature for Vitamins B<sub>6</sub> and Related Compounds.

Carbohydrate Nomenclature — 1.

Nomenclature of Inorganic Boron Compounds.

Report of International Workshop (Ceylon). Evaluation in Chemistry.

C. J. Wilkins, Secretary,  
National Committee of Chemistry.

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## BOOK REVIEW

*Production of the Boranes and Related Research*, by Roland L. Hughes, Ivan C. Smith and Edward W. Lawless. Edited by Richard T. Holzmann. Published by Academic Press, New York and London 1967. 533 pages. Price NZ\$22.00.

This book gives a comprehensive account of the chemistry of boron hydrides and some related compounds as known in 1966. Many numbered references are listed (1673) covering work published before late 1963 when the manuscript was completed but there is also a supplementary list of references, several pages in length, which covers the literature to 1966.

The early part of the book contains a short historical background to the production of boranes and related compounds and outlines the basic processes developed for their preparation. Subsequent chapters deal with the preparation and properties of specific boranes, a review of the kinetic and mechanistic studies made on these molecules and the preparation and properties of the related alkyl boranes and carboranes. Also discussed are the laboratory and pilot-plant separation and purification of boranes, analytical methods applied in their investigation, the acid-base chemistry of selected members of the series and the chemistry of compounds containing boron-nitrogen bonds.

An interesting feature of the book is the inclusion at the end of each chapter of a summary of the material discussed. Approximately one quarter of the book has been set aside for appendices which contain diagrams of molecular structures, tables of physical and thermodynamic properties and a table of references relating to infra-red spectra. There is also a section on the toxicology of the boranes. The volume provides an excellent coverage of an important and relatively self-contained area of chemistry but it suffers, in 1970, from having been published in 1967.

J. M. WATERS.

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NZIC 1971 CONFERENCE

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AUGUST 23-26

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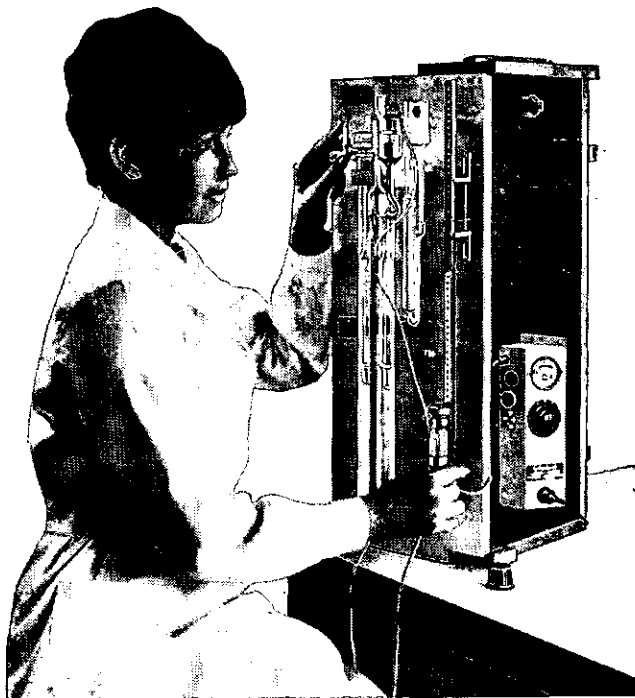
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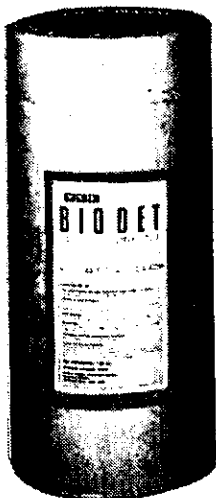
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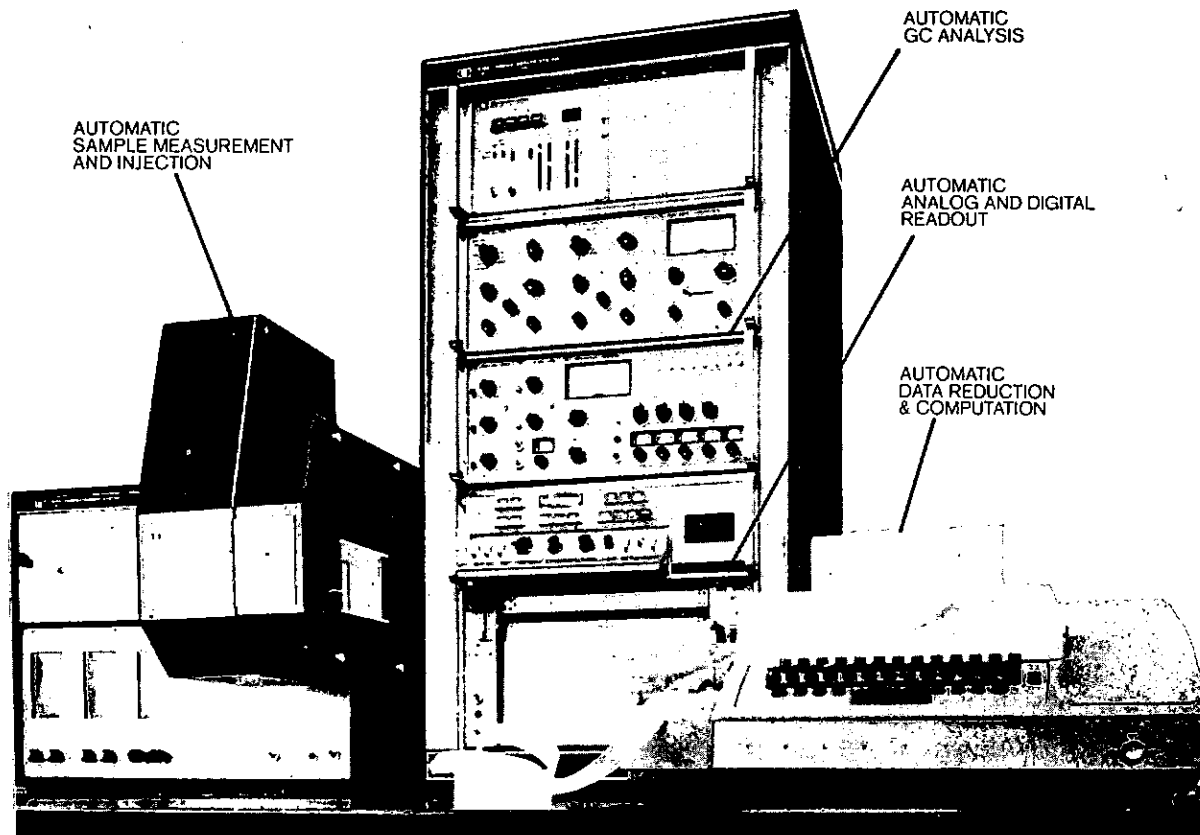
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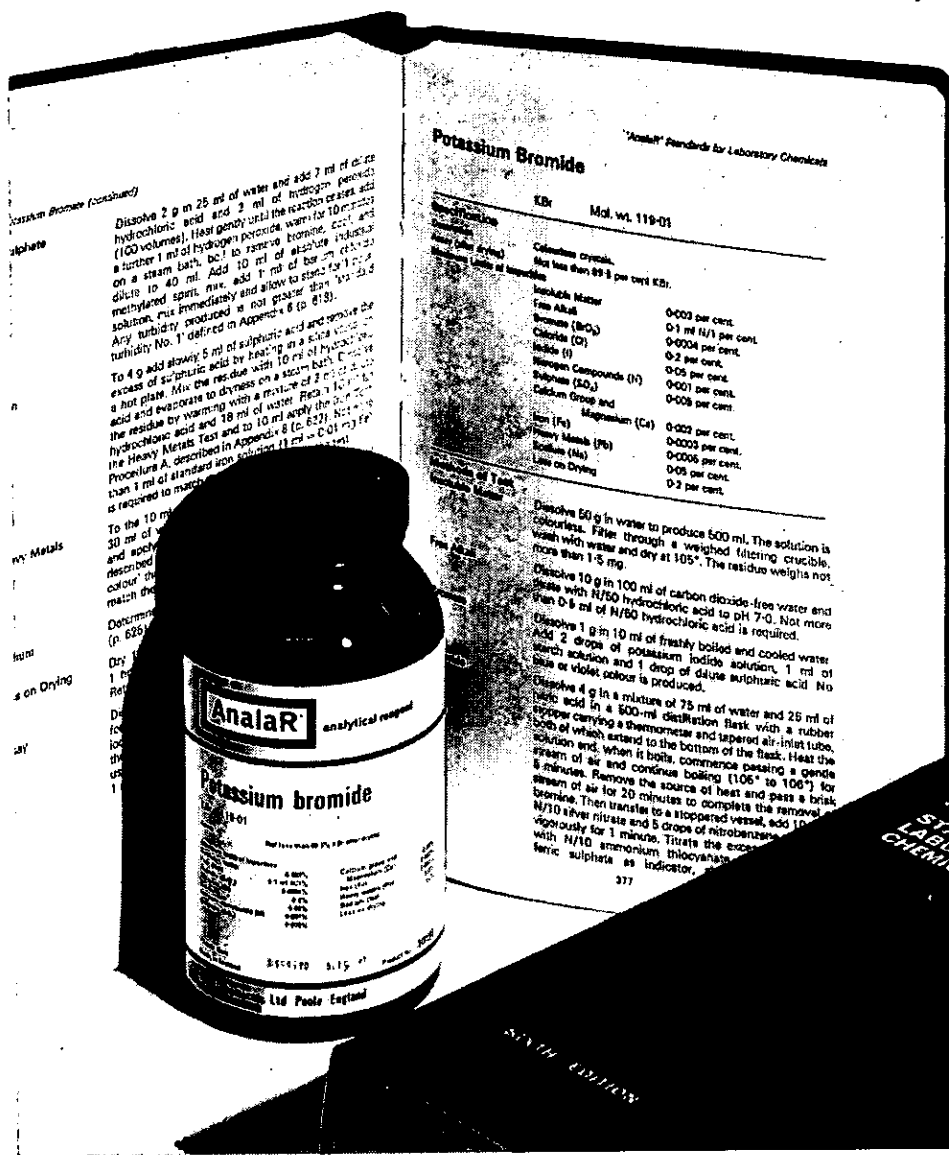
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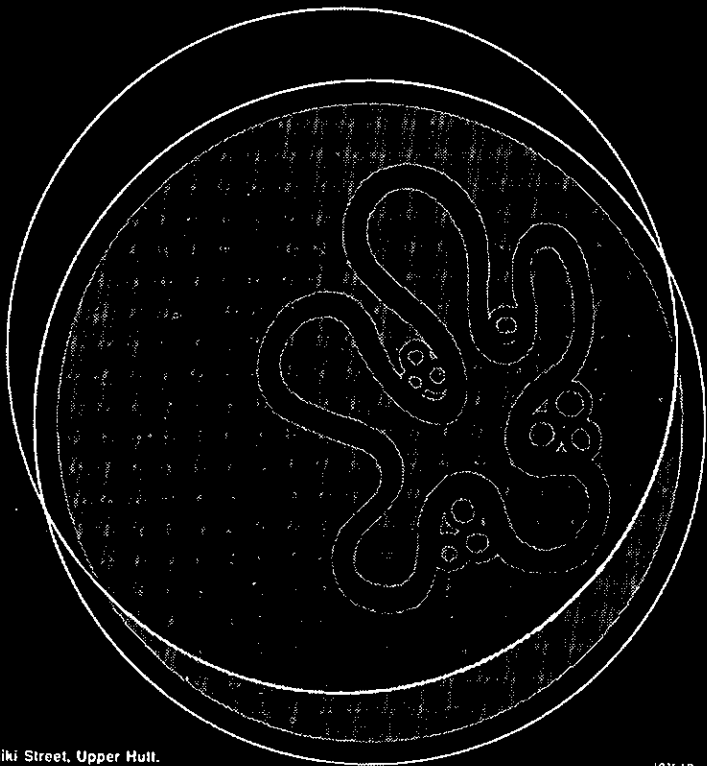
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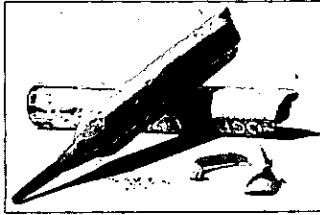


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continuously record weight changes, feed the values to data processing equipment or sort out according to plus-minus tolerance limits.

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