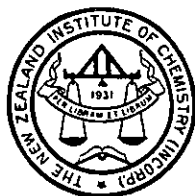


JOURNAL OF THE NEW ZEALAND INSTITUTE OF CHEMISTRY

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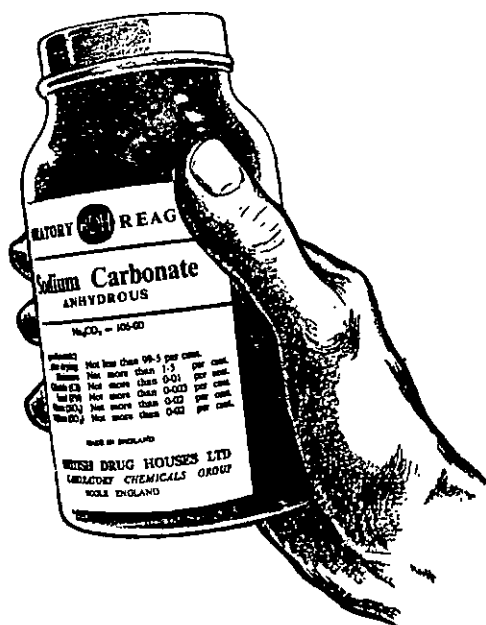
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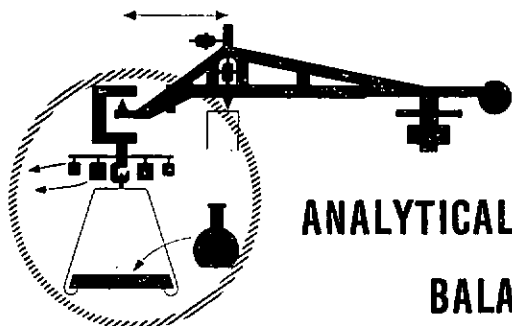
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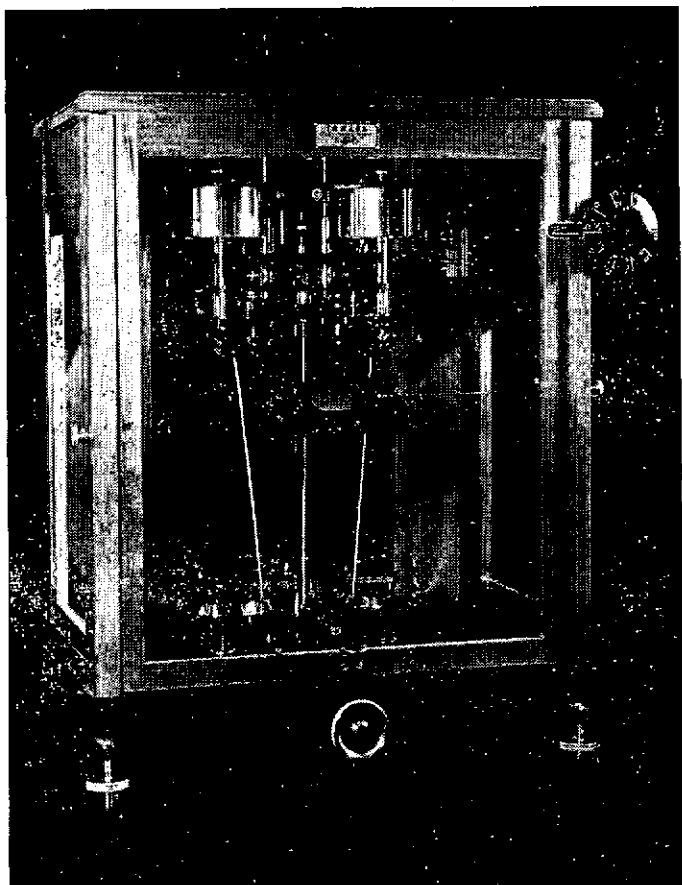
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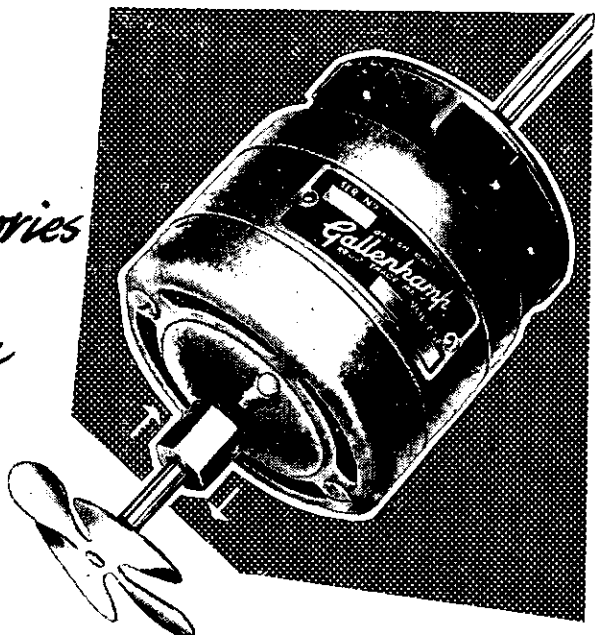
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EDITORIAL

(Contributed by W. E. Russell, Chairman, Auckland Branch.)

There is little doubt that the time is at hand for fundamental changes in the concept of technical education in this country. When the pattern of our technical education system was laid down the number of New Zealanders engaged in secondary industries was small. Today, there are more workers in factories than there are on farms and the primary industries themselves are feeling the need for more technologists and technicians.

Last year a British Government White Paper on Technical Education (Command Paper, 9703, H.M.S.O. London, February, 1956), referring to the "world-wide scientific revolution", stated extensive plans and expenditure for stepping up the output of technologists and technicians in Great Britain. Whilst this new challenge to science, industry and education is likely to strike later and less violently in New Zealand than in other highly industrialised countries, it cannot miss us altogether. The British White Paper estimates that for every technologist (defined as a person having the qualifications and experience required for membership of a professional institution) five or six technicians are needed to apply specialised knowledge under his direction. This ratio will no doubt vary, but no authority seems to put it at less than two to one. Of over 550 chemists employed in all branches of chemistry in New Zealand, approximately 220, or 40%, are employed in industry or industrial research associations. There are no accurate estimates of the number of technicians associated with these chemists. That their numbers in no way approach the minimum of 440 required is seen from the fact that during the last ten years only twenty-nine candidates have qualified for our Laboratory Assistant's Certificate. That New Zealand has been backward in the provision of suitable training for technicians, or indeed, in the very recognition of this important category of scientific worker, is an inescapable conclusion.

The establishment, late in 1954, of the New Zealand Certificates of Engineering is a step in engineering sciences towards meeting the deficiency. These Certificates, the training for which is carried out now in technical schools, are based on syllabuses and examinations under a Controlling Authority upon which are representatives of the New Zealand Institution of Engineers, the Engineers' and Assistants' Association, the Technical Education Association, the Universities and the Department of Education. In 1955, approximately 80 students were studying for one of the two certificates, whilst in 1956, this number increased to well over 200. What is being done for engineering sciences could be done in other fields, but, until men with the proper training are available, industry itself is not fully aware of what it needs.

Three meetings, attended by chemists from industry and from the University, and by educationalists, were held in Auckland early this year to discuss the need for technician training. A sub-committee was set up,

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and despite some differences in opinion on standards, it was unanimous in its recommendation for the early establishment of a course of training leading to a National Certificate in Chemistry. Following this start, at a Council Meeting in March 7th of this year, it was resolved that the Director of Education be approached to establish a course at existing technical schools leading to a National Certificate in Chemistry.

It is our duty, as the National body representing professional chemists in New Zealand to have a leading voice in establishing suitable courses, and to be represented on the Controlling body. Unless we show more enthusiasm we are unlikely to be heard.

OFFICIAL NOTICE.

A GENERAL MEETING OF THE NEW ZEALAND INSTITUTE OF CHEMISTRY (INC.) WILL BE HELD IN ROOM 15, CANTERBURY UNIVERSITY COLLEGE, CHRISTCHURCH, ON THURSDAY, 29th AUGUST, 1957, AT 8 P.M.

AGENDA.

1. Confirmation of Minutes of the last General Meeting held at Auckland University College on Wednesday, 22nd August, 1956. Matters arising out of these minutes will be dealt with under the appropriate heading below.
2. Presidential Remarks.
3. Institute Prizes.
4. Sub-Committees of Council:
 - (a) Membership
 - (b) Journal
 - (c) Professional Status
 - (d) Salaries
 - (e) Examinations
 - (f) Standards Institute
 - (g) Employment
 - (h) Conferences
5. Finance. Balance Sheet and Statement of Receipts and Payments.
6. Training of Technicians and Technologists.
7. Rules and Regulations. Possible changes in the Rules concerning the election of Officers of the Institute, and the end of the Institute year.
8. Royal Charter.
9. General.

W. E. HARVEY,

Hon. General Secretary.

HIGHER EDUCATION IN THE SOVIET UNION

BY S. N. SLATER,

Professor of Chemistry, Victoria University College, Wellington

(Based on Addresses Delivered to the Manawatu and Wellington Branches of the New Zealand Institute of Chemistry, April, 1957.)

Towards the end of last year I was privileged to form a member of a small delegation from the University of New Zealand to Moscow State University. The other members were the Chancellor, Sir David Smith, and Professor MacElwee of the Engineering School of Canterbury University College. We went at the invitation of Moscow University and were their guests not only in Moscow itself but also on a quite extended tour of other centres. Before going any further I should like to pay a tribute to our hosts for their kindness and courtesy to us and their willingness to do everything possible to make our visit pleasant and profitable, and to the uniformly friendly reception we received from all Soviet citizens with whom we came in contact.

As finally agreed upon shortly after our arrival, our visit took the form of an initial and final stay in Moscow, the intermediate time being spent on a quite extended tour of the Soviet Union West of the Urals, including Leningrad, Kiev, the ancient city of Tiflis, now known as Tbilisi, and Sokhumi, the health resort on the Black Sea. In order that we might travel easily and talk readily we were provided with a chef-de-tour, Docent Mishin of the Law Faculty of Moscow University, and an Intourist interpreter. These two people were our constant companions every day for the whole of the tour. In Tbilisi and the Black Sea region we were joined by a second interpreter to help us with the Georgian language, and in Sokhumi by a guide from what I took to be the local equivalent of our Town Clerk's Office.

In the course of these travels we saw many other delegations and in Moscow itself it seemed that every one of the main hotels was full from basement to attic with members of foreign delegations. The lot of the Russian visitor to Moscow must have been most unenviable with accommodation at such a premium. It was clear in fact that the Soviet Union regarded the visits of these foreign delegations as of the greatest importance and this was apparent to us from the trouble taken over our own very small group and in the people we met. For example, we were accorded a two-hour meeting with the Minister for Higher Education and his chief advisers.

Needless to say we found the University staff uniformly friendly and courteous and I think delighted to make contact again with foreigners. It came as something of a shock, for example, to realise that we were the first English-speaking people whom

the wife of the Rector of Leningrad University had met. Leningrad is the second great educational centre of Russia, and is famous for its historic contacts with the West. The students appeared extremely keen on their work, and the senior ones particularly showed much pride in their achievements. We took the opportunity in all centres of screening a number of very good New Zealand travel and documentary films to them, by way of breaking the ice, and then did our best to meet them. They exhibited considerable interest in conditions of life here. It may not have been co-incidence that it was only in Moscow, however, that we were asked to give them our comments on Russia as we saw it.

No restriction was placed on our personal movements, and we were always free to use cameras. To the extent that it was possible to make changes in the arranged programme this was done to suit our wishes and convenience and in general no trouble was spared to see that we enjoyed and benefited from our visit.

Higher Education:

My personal impressions of the Russian higher educational system are somewhat circumscribed by the nature of our visit. The Universities—of which there are something over 30—form only a small proportion of the establishments which offer training at University level. By far the greater proportion—over 800—is made up of the very characteristic “Institutes” which offer courses of a more specialised, or as we might describe it, professional nature. The Universities are concerned essentially with a broader type of education than the Institutes, many of which would correspond roughly to our own special schools, though they are independent of the Universities. There is a further important distinction between Western and Soviet Universities, particularly in connexion with the training of scientists. Much of the advanced work, at Ph.D. level and beyond, which with us is concentrated in the Universities, is in Russia conducted in Research Institutes. As guests of Moscow University we gained, I think, a reliable general impression of University work through the visits arranged to the Faculties of that University and those of Leningrad, Kiev, and Georgia (Tbilisi). Outside the Universities I saw only the Moscow Institute of Fine Chemical Technology, and the Chemical Laboratories of the Ukrainian Academy of Sciences. Professor MacElwee was able to visit one or two of the Electrical Engineering Institutes.

Although my views are thus based, at first hand, on a limited number of visits to (mainly) Faculties of Chemistry, I think it fair to generalise since in the first place all the Universities teach to a uniform curriculum and syllabus, and the Faculties visited ranged from the largest and newest to a small “provincial” one.

Entry (at the age of about 17, after 10 years at school) is competitive, and for some coveted places, (e.g. those in the "Chair" of the Chemistry of Synthetic Drugs at the Moscow Institute of Fine Chemical Technology) extremely so. A figure of 1 in 12 being accepted was mentioned in this particular case. The course for the initial diploma is a 5-year one, and includes required studies in Marxism-Leninism and in Physical Culture. The University course for chemists is as follows:

First Year: Inorganic Chemistry, Mathematics, Physics, Language.

Second Year: Analytical Chemistry, Mathematics, Physics.

Third Year: Organic Chemistry, Introduction to Physical Chemistry.

Fourth Year: Physical Chemistry, Colloid Chemistry, Chemical Technology, One and a-half month's work in a chemical plant.

Fifth Year: History of Chemistry, Study of a special branch of chemistry (e.g. petroleum chemistry), A short thesis.

It may thus be seen that the course is broadly based, with limited specialisation in the final year. A much greater degree of specialisation is encountered in the work of the Institutes, particularly those concerned with the training of engineers.

Very great stress is laid on laboratory work, and in first-year chemistry 12 hours per week are spent in this way. The first-year practical course at Moscow was most impressive, and in the generous time available there was extensive instruction in practical physical as well as general chemistry. Examinations from start to finish appear to be entirely oral, and the failure rate very low. Marks are out of a total of five, and examiners seem very ready to award grades of four or five. We were fortunate in bringing away a selection of the printed teaching syllabuses, used throughout Russia, and some of these have now been translated in full. I was extremely interested in the syllabus in Molecular Structure, since this was a field in which there had been ideological differences of opinion paralleling those associated with the name of Lysenko in the biological sciences. It is clear that this position still holds and that there is a proscription on the teaching of certain theories of Western origin:

"The problem of molecular structure is one of the basic problems of Chemistry. Its study is closely connected with the answers to many questions in general philosophy. This course will therefore play an important part in forming the students dialectical materialistic outlook on the world, confirming with specific examples

the truth of the fundamentals of dialectical materialism. The course is intended to show students the progressive contribution of materialism to the theory of molecular structure and the inadequacy of subjectivist points of view—the so-called theory of resonance and mesomerism, etc.”

I did not have the benefit of acquaintance with this document at the time of my visit, and it provides in retrospect some clue to the cause of the somewhat obscure replies to my enquiries about the freedom of chemists to teach or use these modern theories.

Following the initial diploma, students may apply for enrolment as “aspirants” for the degree of “Candidate of Science”, which has been roughly equated with our Ph.D. A limited number of aspirants may be directed by the Professors of the Universities, while others carry out their work in the Institutes. Inasmuch as a Professor may hold a multiple appointment and be at the same time Director of a Research Institute, he may have a considerable number of research students working with him. In the past, the chief requirement for the degree has been the thesis, which had to be publicly defended. Recently, however, some changes have been introduced. Except in special fields such as mathematics and theoretical physics, aspirants must first secure two years of practical experience before commencing their work. A thesis is no longer obligatory, but if one is presented it will give the Candidate a special claim on teaching and research positions. Finally, there is the degree of Doctor of Science.

A great deal has been written recently about the quantity and quality of the Russian output of scientists and I suspect that you may be chiefly interested to have my impressions on this matter.

First let us take the easy question of physical facilities. The Moscow Chemistry Department is housed in fine new laboratories whose general appearance is everything that one would expect in a modern University. The teaching facilities in the large lecture theatres are the equal of anything I have seen anywhere, and clearly the greatest importance is attached to this side of the work of the University. The equipment generally is plentiful and adequate, but would not be superior to that of Western University Departments. Infra-red facilities were not yet available and there was little ground-glassware in evidence. Of the remaining Chemistry Departments, all were inadequately housed, sometimes quite miserably so, and their equipment was by no means impressive. The University of Georgia's Department was an interesting pointer to the future development of what I might describe as the provincial Universities. It was new, but quite undistinguished in either its laboratories or equipment.

Because of the limitations to our visits I cannot speak from personal knowledge of the many very important research laboratories of the Academy of Sciences. Some of these are new, and I imagine them as being comparable with those of Moscow University, with presumable more lavish special research facilities.

My colleague, Professor MacElwee, visited a number of electrical engineering teaching establishments. I believe that in size and in some respects facilities they may be well ahead of similar Western establishments. This is in keeping with the enormous Soviet output of technologists, who are clearly regarded as the builders of the new Russia. Nothing seems to have been spared in the planning of these training Institutes, which also house much of the research activities of the Union in the particular fields of study concerned.

Secondly, we may take the quality of the graduates, which requires an examination of the courses of study and of such additional matters as the number and quality of the staff. I have already outlined the University course in Chemistry, and I think it may be accepted that the Russian scientist or technologist graduates with a thorough training within the limits of the prescribed syllabus, which may or may not be designed to produce a specialist. One feature which the Universities lack is the great schools of research which one associates with the best of the Western Universities. This is a consequence of the system, and one would need to visit the more important research Institutes to get a balanced picture of the advanced training of scientists.

Of the staff, it may be said that the more important University Departments of Chemistry have their share of distinguished scientists, and salaries are such as to attract the best men. The really impressive feature of staffing, however, is the very favourable ratio of staff to students. In the Chemistry Departments I visited this was uniformly about three times better than in our own Department at Victoria University College. I doubt whether it can be bettered anywhere in the world.

Associated with the question of staffing is the all-important one of the supply of teachers for the schools. This is excellent, as far as one can judge from reports, and a high proportion of all the current University graduates is being ploughed back into school training. The cumulative long-term result of such a policy must be very apparent to us all.

We come now to the question of the numbers of graduates in science and technology. In Chemistry, these are not abnormally large. In Moscow the yearly output from the University might be of the order of 250 and in Leningrad 200. This would be substantially increased by the output from special Chemical Institutes. All available statistics show, however, that the production of engineers is enormous and the planned increase in the present five-year plan is of the order of 100%. Most comparisons have been with the American output, and the following table is on such a basis:

	Thousands of Graduates		Ratio
	U.S.S.R. (1954).	U.S.A. (1953)	U.S.S.R./U.S.A.
Total	173	305	0.56
Engineering	53	24	2.2
Agriculture	18	10	1.8
Health	24	23	1.0
Other fields	78	248	0.3

The total enrolment in higher educational establishments in 1956 was about 1,800,000, of which 700,000 were part-time or external.

Planning of Science.

The Soviet Union has been in a position to reap a rich harvest merely by making use of the general body of published scientific and technological information. Her needs for fundamental research, except in such specialised fields as nuclear science, have been less than for studies in the application of existing knowledge. For this purpose large numbers of adequately trained graduates in science and technology, and a supporting army of technicians have been required. Perhaps the most striking of the steps taken to ensure this supply of skilled manpower has been the resolute creation of the necessary educational system alongside and ahead of the industrial development schemes.

The other problem, of course, is to arrange that the students will come along to take advantage of the facilities provided. In tackling this question, the Russians have been realistic enough to recognise that the carrot is more effective than the stick. The

carrot is an attractive one. Salaries of the two groups concerned, the teachers in the higher educational establishments and the scientists and technologists, are high relative to those of other professional workers. As a further concession to the vital part of engineers in developing the country's resources, they are exempt from military service.

Over and above these inducements there is an effective use of legitimate propaganda, in that leading scientists and engineers visit the schools and persuade the children to embark on such careers.

Finally, there is the carefully fostered feeling amongst each generation of school children and more senior students that their efforts will lead to the continued and increased progress of their country. We as a race do not so readily advocate or absorb such sentiments and I should find it difficult, I think, to carry a Stage I class with me if I were to attempt to glorify the role of chemistry in advancing the well-being of the Commonwealth. It may be a difference in national temperament, or perhaps simply the lack of such an approach at an early stage in our education. However, the general view of Western visitors to Russia is that the students and professional workers do have a feeling that each is contributing to the welfare and economy of his country. In the case of the students I certainly found, particularly amongst the senior ones, a very obvious pride in their work, and Dr. Haslegrave, Principal of the Loughborough College of Technology spoke of the students he saw as having a burning enthusiasm and showing a much greater attentiveness in class than he had ever seen in a British Institution.

There are of course many other important aspects of the planning of science—for example the whole broad and vitally important question of the relations between the education and industry, both as regards deployment of staff and the housing of research and developmental projects—but the two I have discussed have particular relevance to our own problems in the West. Not the least of these are the staffing of the schools and the recruitment of scientists and technologists.

A SCHEME FOR UNIVERSITY DEVELOPMENT

BY A. L. ODELL, *Senior Lecturer in Chemistry* and E. M. FRASER, *Lecturer in History.*

Auckland University College, Auckland.

Two equally serious and important problems face the University and the Government in planning the future of University education within the limits of the New Zealand economy. In an age of technology it is essential to expand and develop scientific research while at the same time rapidly increasing numbers of students are pressing for accommodation. It is undesirable that New Zealand Colleges should develop much beyond double their present size, yet the great cost of establishing new universities equipped to offer a full range of research facilities and advanced courses, must be at the expense of the four major established colleges which are all poorly equipped and understaffed, especially lacking skilled technical staff. Exclusion of students is no solution because it cannot be operated fairly and would not be accepted by the public.

We believe, however, that a solution lies in the fact that the press of students is felt mainly at Stage I level, while the greatest cost, especially in Sciences and allied subjects, is the provision of advanced courses and research schools where large highly specialised staffs, expensive research and library facilities, as well as technical assistance and workshop services, are essential. The preponderance of Stage I students is apparent from the following figures for enrolments this year at Auckland University College in the Departments of Chemistry and History.

Chem. I 315; II 36; III 19; Hons. 12.

History I 225; II 51; III 41; Hons. 22.

In Chemistry, enrolments at Stage I are about five times as great as the total of advanced stages. A somewhat similar situation obtains in History, a typical Arts Department, where the ratio of Stage I to advanced students is about two to one.

These considerations, together with the increasing difficulty of attracting teachers of high calibre in arts and sciences to teach at 6A in Secondary Schools*, has led the writers to suggest the establishment of Junior University Colleges. The Colleges should be incorporated in the development schemes of the four main Colleges, preferably on the same campus. They should also be established in the Waikato and in the Manawatu. Later, as the population grows, further Junior Colleges might be sited in sub-urban areas and in other provincial areas.

All who have qualified for entrance should be accepted at these Colleges for a course which would normally occupy a full-time student for two years. They would take subjects at Stage 0

* In sciences the position is already critical. See paper by E. J. Searle, A.N.Z.A.A.S. Conference, 1957.

(equivalent to the present 6A) in the first year and Stage I in the second year.* They would need to qualify by passing Intermediate examinations before entering the University proper at the present Stage II level.

The following suggestions indicate one way in which the scheme might develop.

In these Junior University Colleges there should be a choice of two Intermediates for Science, (i) Physical Science, (ii) Field Sciences, and perhaps three Intermediates for Arts. The present Intermediates in Medicine, Engineering, etc., could be incorporated in this scheme while it should be possible to devise suitable courses for Law, Commerce, etc.

The first year should consist of four units at Stage 0 leading to an examination comparable in standard to the present Entrance Scholarship, i.e. somewhat lower than Stage I. (This stage might be taught in some of the larger secondary schools where facilities and staffing are adequate). Students would have an opportunity of adjusting themselves to University methods of study and the University teachers would have full control over entry to Stage I. Stage 0 might also care of some of the compulsory requirements of the present degrees, e.g. English and a foreign language for B.A. and English and Elementary German for Science.

The second year should consist of three Stage I units at a standard rather higher than the present Stage I so that the three units would fully occupy a good full-time student. No concession would be made to poor students who might be required to spend two years over this part of the course. At the end of the Junior University Course, successful students would be awarded a "University Diploma in Science" or in Arts, etc. This would entitle the holder to admission to the advanced stages of a degree course at the University proper.

It would be necessary for Junior University Colleges to be closely integrated with a parent University, and each department should be under the Professor of the subject in the parent University. Visits and interchange of staffs would do much to maintain close contact.

The main advantages of this scheme are:—

- (1) The concentration of research funds and of all advanced students in the four main centres will develop New Zealand University Research Schools which are struggling for recognition against much more lavishly equipped and staffed insti-

* Secondary pupils not desiring to enter the University would be catered for as at present in Secondary Schools.

tutions abroad. Able students, expensive equipment, and eminent scholars are all necessary and can be obtained only by concentrating resources.

- (2) The large increase in numbers of students would be catered for nearer their homes and at a lower cost than the present system. A Junior College should cost little more than a well equipped secondary school.
- (3) Not only would they be cheaper but they could be built much more rapidly than University Colleges.
- (4) The scheme would make a contribution to solving the problem of the shortage of highly qualified teachers who would be required only for School Certificate and University Entrance forms. There would be a stronger incentive than at present for Honours graduates, especially in Science, to enter teaching at the Junior College level.
- (5) The University Diploma in Arts (or Science) could be used as a qualification for teachers especially in junior forms. This would help to solve the approaching shortage of secondary teachers.
- (6) The Intermediate Course in Science could well be a first step in the training of technologists.
- (7) Junior Colleges would provide adequate University facilities for Teachers' Colleges established outside main centres.
- (8) The scheme allows a better transition from School to University and avoids the disadvantages of the present 6A. It removes the emphasis on cramming for scholarship yet offers an incentive for sound study. The present Entrance Scholarship could well be awarded on the results of the Stage I examinations and be tenable at the University proper.
- (9) Students not capable of benefitting from University education would be weeded out at an early stage, but all would receive equal chances with uniformly high standards of instruction and equipment.
- (10) Stage I courses would be much more efficiently organised than at present, with the elimination of those who fail to pass at Stage 0. Students would also have completed all elementary subjects before going to advanced stages.
- (11) In the advanced stages there would be greater freedom in arranging courses. With all elementary subjects out of the way timetable difficulties would be minimised. A student should be able to choose either a general course or a specialised (honours) course.

LETTER TO THE EDITOR:

TRAINING OF TECHNICIANS.

Sir.—As a result of, a series of meetings held in Auckland earlier this year, seven recommendations were made in connection with the establishment of suitable courses for the education of technicians. These recommendations were forwarded to the Council of the N.Z.I.C. and to the Department of Education. Whilst the meetings were well attended by chemists from industry, by representatives from the Auckland University College, and by representatives from the Department of Education and of the Seddon Memorial Technical College senior staff, I feel that the results of these meetings should be brought to the notice of professional chemists in other centres. As it is quite possible that a national meeting will be called on the subject, the need or otherwise for similar courses elsewhere can be viewed in the light of these recommendations. They are as follows:—

- (1) That a National Certificate for technicians in Chemistry be established.
- (2) That the course of study be arranged in three parts each normally of one year's part-time study, this to be regarded as a first stage only at which a candidate would have a completed qualification if he so wishes, but provision should be made for:
 - (a) An endorsed certificate following a special course of study in a particular industry; and
 - (b) Study leading to A.N.Z.I.C.

(Note.—With respect to (b) arrangements could possibly be made for able students to attend University lectures in Theoretical Chemistry (but not necessarily laboratories) to prepare for A.N.Z.I.C. by examination.)

- (3) That the first stage course occupy about 12 hours per week for a normal school year made up approximately in equal proportions of the employer's time and the student's time.
- (4) That the entrance standard be University Entrance but that provision be made in very special circumstances, at the discretion of the Controlling Authority of the examinations, for entry at the School Certificate stage.

(Note.—There was considerable difference of opinion on the standard at entry. The recommendation was carried on a majority vote, the minority favouring the original form, viz.: "That the preferred entrance standard be University Entrance, but that provision be made for admission at School Certificate stage.")

- (5) That subjects and standards be:—

1st Qualifying Examination: Chemistry A, Physics A, Mathematics A, English A, the English to be "communication" English.

2nd Qualifying Examination: Chemistry B, Physics B, Mathematics B, English B, the standard in Physics and Mathematics to be about Entrance Scholarship standard.

3rd Year: Final examination in Chemistry. The theoretical part should be slightly better than B.Sc Stage I, but the whole subject should have a practical and industrial bias and include Analytical, Inorganic, Organic and Theoretical Chemistry.

- (6) That at the completion of the course the candidate be awarded a National Certificate in Technical Chemistry.
- (7) That the regulation and issue of the Certificate be in the hands of a National Controlling Authority comprising representatives of the N.Z.I.C., the N.Z. Manufacturers' Association, the University of New Zealand, the Technical Education Association of New Zealand, and the Department of Education."

W. E. Russell.

NEWS AND NOTES.

AUCKLAND BRANCH.

Dr. D. R. Llewellyn, newly appointed to the second Chair of Chemistry at Auckland University College, paid a literally flying visit to Auckland recently from England to confer with his colleagues on details of possible designs for the new School of Chemistry. Although at the time of going to press the location of the final University site remains undecided, no doubt plans for the Chemistry Department, to be one of the first buildings erected, are well advanced. Dr. Llewellyn is not expected to return to Auckland until late this year.

CANTERBURY BRANCH.

Mr. A. J. D. Robb has transferred to the Dunedin Branch of Fletcher Industries Ltd.

Mr. Ross Elder has resigned from the staff of the Timaru Girls' High School to take up the position of Science Master at Linwood High School, Christchurch.

Mr. R. B. Nevin, formerly of the Dental School, University of Otago, has been appointed Principal Dental Officer, Health Department, Christchurch.

Mr. J. Vaughan, Senior Lecturer in Organic Chemistry at Canterbury University College, has returned to Christchurch after spending a year at the University of Michigan and some months in the United Kingdom.

Dr. C. J. Wilkins, Senior Lecturer in Inorganic Chemistry, Canterbury University College, leaves shortly for six months' refresher leave in the United Kingdom and Germany. He plans to visit a number of University laboratories and to do some electron diffraction work at Oxford.

OTAGO BRANCH.

The May meeting of the Otago Branch took the form of a forum discussion on the subject, "Would you have your son a Chemist". Four speakers, Dr. Murray, representing the University; Mr. McChesney for school teaching; Mr. Keys for D.S.I.R., and Mr. Thompson for industry put their points of view and the subject was then thrown open to the meeting. An interesting discussion ensued without conclusive results.

COUNCIL MINUTES

MINUTES OF A MEETING OF COUNCIL-IN-PERSON
OF THE NEW ZEALAND INSTITUTE OF CHEMISTRY
(INC.) HELD IN THE CONFERENCE ROOM, D.S.I.R.,
WELLINGTON, ON FRIDAY, 10th MAY, 1957.

PRESENT:

W. A. Joiner (President, in the chair); Prof. C. R. Barnicoat (Vice-President); W. E. Russell (Auckland); Dr. E. B. Davies (Waikato); Dr. W. A. McGillivray (Manawatu); J. R. Beck (Wellington, proxy); Dr. R. M. Allison (Canterbury); A. J. Ellis (Otago); Dr. W. E. Harvey (Hon. General Secretary), and L. J. Rollo (Registrar.) An apology was received from A. P. Oliver, Wellington delegate.

CONFERENCE, 1957:

Dr. Allison reported briefly on the work of the Conference Committee.

Guest Lecturer: Dr. Allison outlined the steps Conference Committee had taken to investigate the possibility of arranging for Prof. T. A. Geissman of U.C.L.A. to pay a visit to New Zealand at the time of Conference. Prof. Geissman is coming to Australia on a Fulbright scholarship and it appears that the Fulbright Fund would probably pay his travelling expenses to and within New Zealand. The University Colleges and D.S.I.R. have been approached to assist in financing the visit to New Zealand.
Resolved.—THAT the Conference Committee be authorised to spend up to £50 to assist financing the proposed visit to New Zealand of Prof. T. A. Geissman.

CONFERENCE SURPLUS, 1956:

A letter from the N.Z. Section, R.I.C., expressing the view that surplus funds from a Conference should be credited to the forthcoming Committee and not utilised for any other purpose whatsoever was received.

After discussion it was agreed that Council should adhere to its original decision to place the surplus from the 1956 Conference in the Overseas Visitors' Fund.

L.A.C. GLASSBLOWING:

A letter from A. J. Metson drew attention to the difficulty that arose in Wellington in providing soda glass for the practical examination in glass blowing, and raised the question as to whether soda glass should be used in any case. The Examinations Committee considered that soda glass should continue to be used and the Committee would arrange to make supplies available.

JOURNAL:

The Editor reminded members that copy is slow in coming forward.

REGISTRAR:

Suggested "Conditions of Appointment of Registrar" were discussed and, with some slight amendment, it was resolved that these be approved.

ROYAL CHARTER:

Dr. McGillivray reported that the Committee was making progress and hoped to be in a position to present a report shortly.

TRAINING OF TECHNICIANS:

A letter from the Director of Education indicates that the Education Department would probably be prepared to call a meeting of representatives of bodies interested in the training of chemical technicians. The

Secretary was instructed to reply to the Director of Education listing bodies or organisations which might be represented at such a meeting.

The Examinations Committee has expressed concern that its views may have been overlooked, but it was generally agreed that the Committee would be fully consulted before any definite steps were taken by Council.

TIMBER PRESERVATION AUTHORITY:

A letter was received from K. M. Griffin pointing out that no chemist was attending the meeting of the Technical Sub-Committee of the Timber Preservation Authority held in Auckland recently.

Council felt that no useful purpose would be served by again writing to the Minister reiterating the view that the N.Z.I.C. should have a representative on the Timber Preservation Authority. It was pointed out that at least one member of the Authority is a member of this Institute so that there is one chemist on the Authority even though the N.Z.I.C. is not represented officially.

RETENTION OF OUTSTANDING SCIENTISTS:

This matter had been referred to Branches and it was generally agreed that, although no one questioned the need to retain, if possible, outstanding scientists or to increase the salaries of scientists generally, the proposed scheme was not a practicable one.

BALANCE SHEET:

The Registrar reported on discussions he had had with the Auditors concerning the Balance Sheet. A number of small matters remain to be cleared up before the audit can be completed.

Resolved.—THAT the President and the Hon. General Secretary be authorised to decide, after consultation with the auditors, whether compounded subscriptions should be paid into the General Funds or kept in a special account.

CHEMISTRY IN CANADA:

The Chemical Institute of Canada is no longer prepared to supply *Chemistry in Canada* free of charge. It was agreed that as the N.Z.I.C. does not normally purchase journals we would not be prepared to buy this Journal.

PROCEEDINGS OF THE CHEMICAL SOCIETY:

S. G. Brooker has suggested that the N.Z.I.C. might ask the Chemical Society of London to supply copies of the *Proceedings* as an exchange for the N.Z.I.C. *Journal* which the Society receives. It was generally agreed that as the *Proceedings* are so widely available there seemed little point in asking for a further copy for the Institute.

RULES:

N. T. Clare has made a series of suggestions concerning the election of delegates, the election of the Vice-President and the alteration of the Institute year. Mr. Clare's remarks have the approval of Dr. Fastier whose suggested changes in procedure were referred to Branches for consideration.

W. E. HARVEY,

Hon. General Secretary.

THE NEW ZEALAND INSTITUTE OF CHEMISTRY (Inc.)
BALANCE SHEET AS AT 31st OCTOBER, 1956.

LIABILITIES.			ASSETS.		
1955	£	s d	1955	£	s d
219	Sundry Creditors	322 13 4	CASH BALANCES—		
17	Provision for Taxation	47 14 2	Bank of New Zealand	654 14 1	
			Petty Cash	22 14 1	
99	Subscriptions Paid in Advance	370 7 6	Post Office Savings Bank	165 17 3	843 5 5
150	Provision for Printing	58 19 6			603 18 3
30	Provision for Essay Prize		National Savings Account		
30	Provision for Overseas	150 0 0	Subscriptions in Arrears	434 0 0	
	Visitors Travelling	30 0 0	Less Provision for		
		70 3 1	Overdue Subscriptions	50 0 0	
	Accumulated Funds—				384 0 0
	Balance, 1/11/1955	1,241 8 3	Sundry Debtors		191 4 0
	Less Transfer to Trust Fund	75 0 0	Typewriters, 1/11/1955	25 0 0	
		1,166 8 3	Less Depreciation for Year	4 0 0	
	Add Excess of Income				21 0 0
	over Expenditure		Addressograph Plates—		
1241	Balance, 31/10/1956	195 9 4	Balance, 1/11/1955	15 0 0	
879	Trust Fund	1,361 17 7	Less Depreciation	4 0 0	
	Compounded Subscriptions	984 8 9			11 0 0
		33 0 0	Trust Fund Investments—		
			Post Office Savings Bank	484 8 9	
			Hutt County		
			Council Debentures	500 0 0	
			Advance 1957 Conference		984 8 9
					20 0 0
2665		£3,058 16 5			£3,058 16 5

AUDITORS' CERTIFICATE.

We have audited the Books of the New Zealand Institute of Chemistry (Inc.) for the year ended 31st October, 1956, and have compared them with the Vouchers produced to us, and with the above Balance Sheet, and accompanying Statements. We have verified the various Cash Balances, and certify that, in our opinion, the above Balance Sheet shows the true position of the Institute.

Wellington, N.Z.,
28th June, 1957.

DYMOCK, MacSHANE and SCLANDERS,

G. B. MACMORRAN, F.P.A.N.Z.,

Auditors.

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st OCTOBER, 1955.

EXPENDITURE.		INCOME.	
1955	£ s d	1955	£ s d
To Administration Expenses—		By Subscriptions	1,119 4 4
187 Salary Registrar	241 13 4	Proportion Compounded Subscriptions	2 12 0
130 Travelling Expenses	117 2 4	Donations	1,121 16 4
120 Printing and Stationery	48 2 3	Interest—	1 1 0
31 Honorarium Secretary	86 15 0	Post Office Savings Bank	4 8 5
60 Branch Expense Allowances	60 0 0	National Savings	18 10 8
49 Postage and Sundries	22 8 7	Examination Committee Fees	22 19 1
12 Audit Fees, 1955 and 1956	25 4 0	1956 Conference Surplus	25 10 6
8 Depreciation	8 0 0	Less R.I.C. Share	10 19 4
597 Total	559 5 6		43 17 7
Journal Expenses—			
402 Printing Costs	621 16 0		
23 Postage	24 1 8		
12 Editor's Honorarium	15 15 0		
437 Total Expenses	661 12 8		
180 Less Advertising 256 12 4			
Reprints	2 0 0		
51 Subscriptions 28 8 6	287 0 10		
206 Total Cost to Institute	374 11 10		
26 Provision for Taxation	31 3 8		
25 1956 Conference Surplus			
Transferred to Overseas			
Visitors' Travel Fund	43 17 7		
Examination			
Committee Expenses	10 16 7		
142 Excess of Income	195 9 4		
996 Transferred	£1,215 4 6		
		996	£1,215 4 6

TRUST FUND FOR THE YEAR ENDED 31st OCTOBER, 1956.

To Balance Carried Down	£ s d 984 8 9	By Balance, 1/11/1955 Transfer from General Funds Interest on Deposit Interest on Debentures	£ s d 879 17 4 75 0 0 9 11 5 20 0 0
<u>£984 8 9</u>	By Balance, 31/10/1956	<u>£984 8 9</u>	<u>£984 8 9</u>

N.Z.I.C. - R.I.C. COMBINED CONFERENCE



PROFESSOR T. A. GEISSMAN

Dr. Geissman, who will be the guest speaker at this year's Conference, is Professor of Organic Chemistry at the University of California, Los Angeles. He is due to arrive in Auckland on 16th August and will visit a number of North Island University and Research establishments before attending the Conference. He will leave Christchurch by air for Melbourne where he is to work on the structure of physiological alkaloids in Australian flora.

SUMMARY OF PROGRAMME

Time and Place:

Tuesday, 27th August to Friday, 30th August, at Canterbury University College, Christchurch, and at Lincoln.

PROGRAMME:

In outline the programme is as follows:—

TUESDAY:

Morning: Registration and Opening Ceremony followed by Presidential Address.

Afternoon: Symposium on "Repercussions in Chemistry of Advances in Other Sciences" (Physics, Geology and Biology).

Evening: Social gathering.

WEDNESDAY:

Morning: Papers dealing with some possible chemical industries and with glues and paints.

Afternoon: Papers on miscellaneous topics.

R.I.C. General Meeting.

Evening: "Easterfield Lecture" (Dr. R. E. Corbett).

THURSDAY:

All day excursion to Lincoln.

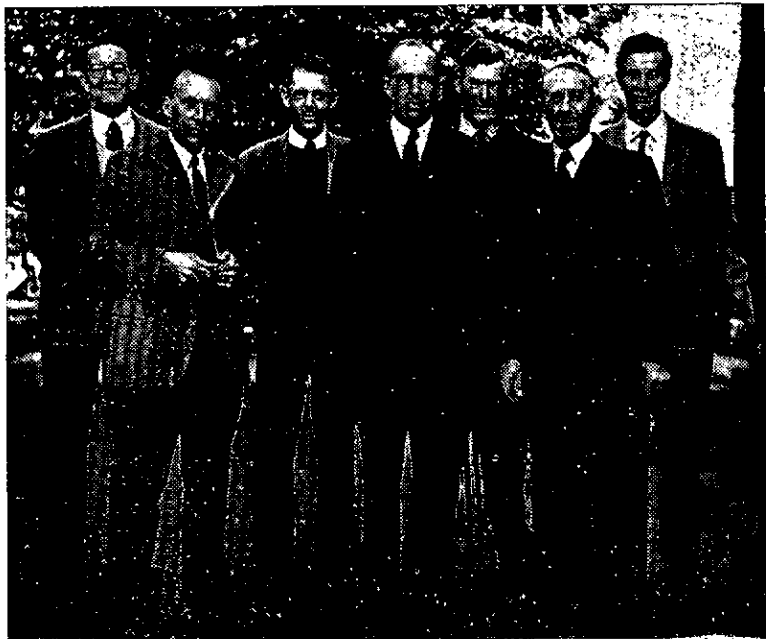
Morning: Papers mainly on agricultural topics.

Afternoon: Tour of inspection, including Canterbury Agricultural College and Crop Research Division, D.S.I.R.

Evening: N.Z.I.C. Annual General Meeting.

FRIDAY:

Morning and Afternoon: Papers dealing mainly with physical and engineering chemistry, and ending with a Guest Lecture by a chemist of considerable distinction, Dr. T. A. Geissman.



CONFERENCE COMMITTEE, CHRISTCHURCH, 1957.

From Left:—N. P. Alcorn, W. S. Metcalf, A. Fischer, E. W. Hullett, D. J. Hogan, F. H. G. Johnstone, R. M. Allison.

(Absent:—M. S. Carrie, R. H. Shepherd, L. Wilkinson).

At the Opening Ceremony it is expected that a general welcome will be extended by the Mayor of Christchurch while the Conference will be officially opened by Mr. W. A. Joiner (President, N.Z.I.C.).

This year the Presidential Address will be given by the Chairman of the N.Z. Section, R.I.C. (Dr. Elsa B. Kidson) who will probably speak on "The Place of N.Z. Women in Chemistry."

Although 19 papers covering a wide range of fields have been offered it is hoped that the programme will avoid the necessity for concurrent sessions.

Trade Display:

A Trade Display will be held as usual and, so far, 10 firms have indicated their intention to prepare exhibits.

Conference Booklet:

This should be distributed to members who have registered shortly after 10th August. It will contain a full, detailed programme and abstracts of all the papers to be presented as well as a list of members attending the Conference with their addresses.

EQUIPMENT PAGE

*(Contributed by Dr. J. R. L. Walker—The Dairy Research Institute
(N.Z.), Palmerston North.)*

In many bacteriological laboratories there is frequently a need to sterilise small quantities of media or glassware without the long delay involved with the usual type of autoclave. The normal domestic pressure cooker makes an ideal small-scale autoclave capable of reaching 15 p.s.i. very rapidly and in the case of glassware it can be quickly cooled in cold water.

The various brands of Silicone anti-foam emulsion now available in New Zealand are invaluable for foam prevention in steam distillations and the like. It is superior to capryl alcohol as an anti-foam agent in the Markham micro-kjeldahl apparatus.

A simple tool for starting syphons is now being advertised in "Nature". The tube is gripped between rollers which are then pulled smartly along it thus creating a partial vacuum.

A new type of electric insulated heating tape is now on the market. Any length can be cut off and connection made by insulated clips provided. The nominal voltage drop is 10-volt per foot for each size. Control is most satisfactorily effected by means of a variable transformer.

Self-sealing serum or vaccine bottle caps, available in a wide range of sizes, have been found very useful in these laboratories. The plug has suction serrations and a thin diaphragm top for injection of samples by a syringe and fine needle. A rubber turnover flap ensures a perfect seal.

INTERESTING YOUTH IN CHEMISTRY.

The pressing need for scientists, technologists and technicians in this country can only be met if a greatly increased number of school children can be made aware of the prospects which careers in science can offer. It is the responsibility of organisations such as our Institute and more especially of us as individual scientists



FUTURE CHEMISTS ?

A group of schoolboys from the Freyberg High School, Palmerston North, stop to discuss a step in the packaging of penicillin with Dr. H. R. Whitehead, Chairman of the Manawatu Branch of the Institute (left) and Mr. C. B. Radcliffe (centre) during the course of a visit to Glaxo Laboratories arranged by the Manawatu Branch for senior post-primary school pupils.

to see that full advantage is taken of every opportunity to provide the necessary information, advice and encouragement. With this aim in view, the Manawatu Branch arranged last year for senior pupils from the post-primary schools in the Palmerston North area to be shown over the Plant Chemistry Laboratory, D.S.I.R. Various analytical procedures were demonstrated and explained to over 100 boys and girls, many of whom had not yet decided on

their future occupation. The experiment proved so successful that it was decided to arrange similar visits each year. This year a much larger group of school children visited the factory of Glaxo Laboratories (N.Z.) Ltd., where they saw the various steps in the formulation, laboratory control and packaging of a range of pharmaceutical products.

The Manawatu Branch feels that the effort put into these demonstrations—and a considerable amount of work is involved in making sure that something of real value is derived from the visits and that the children understand what is being shown to them and are not merely “blinded with science”—is amply repaid by the interest and enthusiasm of the children. The immediate effect of the interest aroused by last year's visit was a greatly increased number of candidates for posts as technicians in local laboratories, some of the applicants dating their interest in chemical employment from the demonstrations at the Plant Chemistry Laboratory. It is hoped that visits of this type will also have a long-term continuing effect in providing recruits for all types of chemical work.

BOOK REVIEWS.

SCIENTIFIC FRENCH, by William N. Locke. Published by John Wiley & Sons, Inc., New York, 1957. 112 pages. Price 2.25 dollars.

SCIENTIFIC GERMAN, by George E. Condoyannis. Published by John Wiley & Sons, Inc., New York, 1957. 164 pages. Price 2.50 dollars.

These two monographs will form a valuable addition to the library of any chemist. They have both been written to fill a need not ordinarily met by elementary language texts. The scientist's interest in a foreign language is normally restricted merely to acquiring, with the minimum time and effort, a reading knowledge sufficient to enable him to cope with technical articles in his own field. His approach is analytical whereas in most language text books it is synthetical. These two books have been written with this analytical approach clearly in mind and with the aid of dictionaries provide valuable tools for the translation of scientific literature.

SOLVENTS (7th Edition), by Thomas H. Durrans. Published by Chapman & Hall Ltd., London, 1957. 244 pages. Price 30/-.

This text, now in its seventh edition, is one of a series of monographs on applied chemistry founded by the late E. Howard Tripp. The present edition has the same general structure as its forerunners, but particular attention has been devoted to more recent aspects of the subject such as solvents and plasticisers for new plastics. Part I deals with theoretical and general aspects of the subject and contains chapters on solvent action, solvent power, plasticising solvents, solvent balance, viscosity, vapour pressure and evaporation rates, inflammability and toxicity. Part II deals in detail with the properties of individual solvents. Extensive appendices cover trade names of solvents, solubility tables and plasticiser proportions.

The book will be of considerable value to many industrial chemists.



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AUSTRALIAN ATOMIC ENERGY COMMISSION.

Applications are invited for appointment to the following positions in the Chemistry Section of the Commission's Research Establishment, which is situated at Lucas Heights, Sydney, N.S.W.

RESEARCH OFFICER — A£1918/1938 (3 Positions)

DUTIES—Position R50—(Chemist) is required for research into the development of high temperature ceramic fuels suitable for a gas cooled reactor system.

Position R5E—(Chemist) is required for research into reactor fuel systems involving liquid sodium.

Position R52—(Spectrographic Chemist or Physicist) is required to build up a spectrographic service within the analytical chemistry services group.

Facilities—The chemistry laboratories will have excellent modern facilities, including a wide range of electrochemical, radiochemical, emission and mass spectrographic, infra red and X-ray spectrographic equipment. A high flux reactor will be available for radiation chemistry studies.

QUAL.—Applicants should possess a University degree with first or second class honours and should have research experience in physical or inorganic chemistry in the case of Positions R50 and R5E, or experience in physical chemistry preferably with spectrographic equipment in the case of Position R52. Applications will be considered from students graduating during 1957.

GENERAL.—Commencing salary will be determined in accordance with the applicant's qualifications and experience. With the expanding research programme there are good prospects for promotion to positions of Senior Research Officer (A£2048/2923) and Principal Research Officer (A£2543/2983). The salary ranges shown include the present cost of living adjustment of £50 p.a. Applications giving full name, date and place of birth, nationality, marital status, present position and salary, qualifications, experience, particulars of any publications, the names and addresses of at least two referees who may be contacted re technical experience, when available for duty and quoting the position number should be forwarded to the Chief Scientist, A.A.E.C. Research Establishment, Private Mail Bag, Sutherland, N.S.W., Australia, not later than 30/8/57.

CHEMISTS
AND
CHEMICAL ENGINEERS

I.C.I. (N.Z.) LTD., invites applications for a position on the Staff of the Company's Gracefield Factory.

Duties: Include Laboratory Control work and Plant Production supervision.

Age: Applicants should preferably be less than 30 years of age.

Qualifications: Degree in Science or Chemical Engineering essential. Practical experience would be an advantage, but is not a pre-requisite.

Salary: Commencing salary will be fully commensurate with qualifications of the successful applicant and the duties involved.

Conditions of service are excellent and there are many advantages in being a Member of the I.C.I. (N.Z.) Ltd., Staff, including security, opportunities for Professional and Financial advancement and a Company subsidised Pension Fund.

Applications: Apply by letter giving full particulars of age, qualifications and experience to:

TECHNICAL MANAGER,
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WELLINGTON.

TASMANIAN DEPARTMENT OF AGRICULTURE

Animal Health Service,
LAUNCESTON.

A vacancy exists for:

BIOCHEMIST (Male)

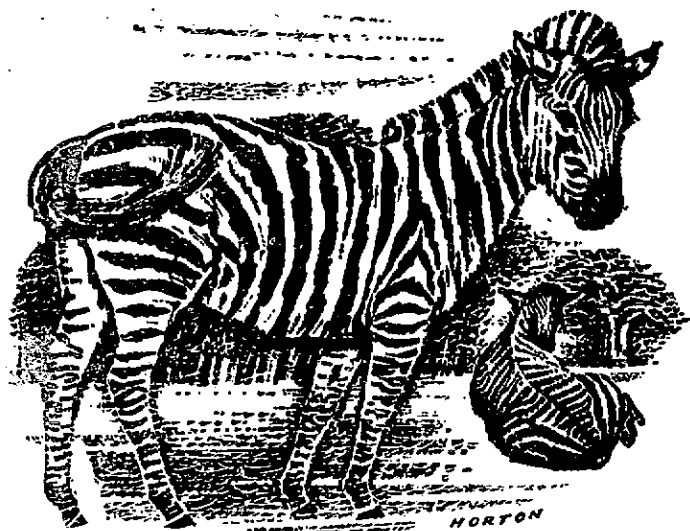
Salary range, £1,504-£1,657 per annum inclusive.

Duties—Will include routine diagnostic work and survey work particularly associated with trace element deficiencies, in the first instance. The successful appointee will be expected to organise the establishment of a laboratory and to train and direct the work of junior technical staff not yet appointed. Opportunities will be available for research work.

Qualifications—A University Degree in Science, preferably with honours, and with a sound background in the biological sciences. Preference will be given to applicants with biochemical experience.

Anyone interested in obtaining further information on this position should write to:

Mr. R. J. GREEN,
Deputy Chief Veterinary Officer,
Department of Agriculture,
Animal Health Service,
LAUNCESTON, TASMANIA.



Protective Colouring

Colour plays an ever-increasing part in the fabrics of today. New and better colours are constantly being added to an already extensive range. In dress, furnishing and curtain materials, people everywhere are alive to the importance of colour. And they want colours that will last, colours that afford protection against light, washing and wear.

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to produce the materials to meet this need. The result is 'Procion' dyestuffs—unique in that they fix themselves to cellulosic fibres by becoming, in effect, a part of the molecule—the basic structure of the fibre itself. Thus, on fabrics such as cotton and rayon, 'Procion' dyestuffs enable textile dyers and printers to produce gay colours with excellent resistance to the stresses of use.

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IMPERIAL CHEMICAL INDUSTRIES (N.Z.) LTD.

N.Z.I.C. — R.I.C.
Combined Conference

Tuesday, 27th August,
to
Friday, 30th August,
1957.



CANTERBURY UNIVERSITY COLLEGE,
CHRISTCHURCH, AND AT LINCOLN.