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of the

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VOLUME IV. MARCH, 1940 NO. 1

EDITORIAL

With this, the fourth volume of the Institute's Journal, the publication appears in a new and much restricted form. The previous issues speak for themselves of the enthusiasm and ability which lay behind their production. The debt which members owe to the pioneer editor and his publications committee in Wellington is a great one. Their vision of what the journal should be, as expressed in the first editorial, is the kind of vision the Institute must foster if it is to ensure that the profession of chemistry will play an appropriate part in New Zealand's development in its second century. With the financial limitations caused by our as yet small membership, it seems however, desirable that the immediate aim of the journal should be to help weld the Institute into a group of people aiming positively at the fulfilment of some well defined purposes. To that end it is first necessary that we should know one another. Since geography forbids that we should meet frequently, indeed that many of us should meet at all, can we not at least meet on paper, in mental contact, publicly? So we hope to have a correspondence column, but it will languish if we have no correspondents. Are you satisfied with the training available in New Zealand for those who wish to become industrial chemists? It not, how can it be bettered and whose is the responsibility to take action? What are the functions of this Institute and is it fulfilling them to your satisfaction? These and other questions come to mind as matters upon which our country members for instance, cut off from the activities of the city members, might well be heard to the benefit of all. If you are not in a position to say what you think, write it that all may read.

We hope also to promote knowledge of one another by printing not only news of what the branches are doing but also of what individual members are doing. We are impressed by the number of members of whom we know nothing, and depressed by the thought that they, poor fellows, know nothing

of us. If you are too modest to record your own achievements, at least let us hear something of those of your member friends.

This number records the 1940 Conference. It is well that it should be recorded, that we may gauge our progress. But a mere account will be of small value if it fails to remind us that the Institute has a purpose. Let us exchange ideas and be ready with plans for action when the next Conference comes round.

A MESSAGE FROM THE PRESIDENT.

With this issue the Journal takes on a new form. It is the hope of the Council that, although the new Journal is a less ambitious affair than the old, it will, nevertheless, fill a definitely felt need. It is hoped that it will now be possible for the publication to be issued regularly four times a year instead of at irregular intervals as hitherto. The intention of the Council is that the Journal will become, to a much greater extent than before, a means of keeping members in touch with the Institute and with one another. Many members are probably quite unaware of much valuable work done by the Council in the last few years in connection with such questions as remuneration of chemists and standards of professional ethics. It should now be practicable to give all members at least some indication of what is going on between the annual meetings.

As it is recognised that Wellington members have done more than their share of work in connection with the earlier issues of the Journal it has been decided to let the work of editing circulate round the branches, and Canterbury has kindly offered to take the responsibility for a time.

I should like to bespeak for the new Editor and his Committee a full measure of help and co-operation from all the members. The Editorial Committee has a difficult enough task at the best, but it will be made much more difficult if material is not freely supplied from the other centres. Branches can help by sending in promptly reports of all Branch activity as well as personal notes on members' doings or other news of interest to chemists. Individual members can often help by sending in notes whenever anything of interest comes to their attention. I heartily support the Editor's suggestion that members make full and free use of the correspondence columns.

The Journal is the responsibility of the whole Institute, not only of the Editorial Committee, and the success of this Journal is a matter of importance to every member.

Country members who are not able to attend branch meetings, and all members who do not often find their way to Annual Conferences have in particular much to gain from the Journal—not, I hope, that its excellence will ever stop anybody from attending a Conference, because there can be no adequate substitute for personal contact and the meetings are very well worth attending—and I ask such members to support the Journal to the fullest possible extent.

The importance attached by Council to the Journal is shown by the fact that it has resolved that up to a third of the annual income may be spent on the publication.

It is my earnest hope that all members will find the Journal well worth having, and will do their best to make it so.

R. GARDNER,
Dunedin, February, 1940.

COUNCIL, 1940.

PRESIDENT: R. GARDNER.

DELEGATES: F. H. V. FIELDER, Auckland.
W. G. HUGHSON, Wellington.
M. M. BURNS, Canterbury.
F. G. SOPER, Otago.

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Hon. Secretary—R. D'Anvers
Committee—R. Stansfield, J. C. Andrews, L. H. Briggs, J. Ricketts.

Wellington:

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Canterbury:

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Committee—M. M. Burns, H. W. Crozier, J. Packer, L. W. Ruddle.

Otago:

Chairman—T. A. Thomson.
Hon. Secretary—M. V. King.
Committee—F. G. Soper, C. L. Carter, R. Gardner, R. V. Peryman.

CONFERENCE, 1940.

The joint annual conference of the Institute and the N.Z. Section of the Institute of Chemistry of Great Britain and Ireland was held in the Dominion Museum, Wellington, on January 26th and 27th, 1940, some fifty members being present.

After a welcome to the visitors by R. L. Andrew, speaking on behalf of both bodies, morning tea was taken, followed by the Annual Meeting of the Institute. The minutes of the General Meeting included a brief precis of G. A. Lawrence's presidential address in 1939, reviewing the foundation and work of the Rothamsted Experimental Station. The report and balance sheet were adopted.

The Secretary reported that the card index of members prepared for conditions of national emergency was in the hands of the Minister of Defence. Members should inform the Secretary if they take up positions which make them unavailable for work along the lines given in their card index.

A lively discussion was held on the Annual Subscription, most speakers favouring the increase passed at the last annual meeting on the grounds that reserves must be built up so that the Institute can further the interests of its members, and also in view of its being involved in litigation through its members. A motion supporting the increase was carried.

A motion recommending that the positions of President and Secretary be filled annually by postal ballot of all members was narrowly defeated. Arising from a question by J. A. Nash, a motion by G. A. Lawrence that the fees of members on active service be remitted was carried unanimously.

In reply to a question, G. A. Lawrence explained that the centennial booklet had been abandoned through factors arising from the war. Some contributors had asked to be relieved of their responsibility for articles, and possible advertising was lost. The publication of articles already submitted is under consideration.

PRESIDENTIAL ADDRESS.

(By R. GARDNER, D.Sc., F.I.C., F.N.Z.I.C.)

Dr. Gardner discussed in the first part of his address the relation of chemists to the manufacturing industries of the Dominion. Taking the view that we are at the beginning of an era of industrial expansion, he said that he had been thinking how we, both as individuals and as an Institute, can further this development. It can be done without lessening the application of science to primary industry. The development of manufactures means a greater utilisation of the products of our own farms, as well as local manufacture of more articles used both on farms and by farmers as individual consumers.

His experience has led him to the conclusion that the great majority of New Zealand manufacturers appreciate the fact that help from scientific workers is essential in their industries. This represents an enormous advance from the position in 1914. In New Zealand then, as elsewhere in the British Empire, a few pioneers were fighting a very uphill fight to make manufacturers see that the work of the scientist could have any relation whatever to industrial production. Those of the pioneer band who are still with us can take a little comfort from the assurance that their work was not in vain. The trouble today is not that the manufacturers do not realise that the scientist can help them, but that they often have only the haziest idea as to how that help may be used, and often expect the impossible. On the one hand they seem most surprised on being told that some of their problems, if they can be solved at all, would involve perhaps months of work, and cannot be done for a couple of guineas, yet on the other hand they fail to call us in on occasions when we could quite simply and cheaply give them information which would be of the greatest help to them. If they say, as they occasionally do, "Well, you show us where you can help us," we are liable to be at a loss because of our lack of detailed knowledge of their problems. A good deal is being done by the technical staffs of the S.I.R. department, not only in solving industrial problems but also in showing industries what kind of problems we can solve.

Fewer people than we generally realise have a clear idea of the relationship between research and routine testing. At one end of the scale we have pure research, undertaken to fill

a gap in our knowledge. Apart from our desire that this country should do its share of this work, pure research deserves the support of industrialists for several reasons. Any piece of new knowledge may have industrial utility, and also pure research is the best possible training for a future industrial chemist. Then we have applied research, undertaken with a view to solving particular practical problems. These sometimes approximate to pure research, in that new facts are discovered which may be useful in solving other problems, and in that the length and difficulty of the problem cannot be foreseen. There are all stages between this and the type of problem which can be solved by a few analyses.

In contrast to research is the application of known methods to particular cases, such as routine analysis of raw materials and finished products. Relatively few manufacturers have yet realised the utility of continuous checking of the composition of materials. Apart from the fact that formulae and processes need adapting to deal with variable materials, cases are often met in which difficulty occurs because of lack of data on the normal functioning of the process. While not minimising research, we can stress the value of systematic routine testing. Moreover many brilliant pieces of research contain as an essential ingredient long series of analyses by standardised methods.

The point of perhaps the greatest importance of all is that adequate use of the services of a specialist chemist depends largely on the level of chemical knowledge possessed by factory managers and similar executives in the industries. The ideal would be to have a trained chemist with suitable equipment in every factory of any size. Such a chemist can best see how and when chemical investigation can be applied. The ideal however, is not practicable for several reasons. One is the nature of the work of a practical chemist, involving operations which can not be left unattended and which it is difficult to combine with other work in the factory. In addition, no one wants to have capital locked up in expensive apparatus which is seldom used. So a works chemist is only a great success if he can be kept fully occupied. For small works some sort of co-operative arrangements are necessary, either a laboratory to serve a single industry or a group of industries over an extensive area, or one to serve all industries in a limited area. Such undertakings could be financed by the industries, or the risk shouldered by a chemist acting as a consultant. In any

case there is the difficulty of effective liaison between laboratory and factory. One would like to see in all factories at least one senior member of the staff with the equivalent of an honours degree in chemistry, whether or not he does laboratory work. Many trained chemists are finding such positions, but it is likely that we will have to rely, in the near future, mainly on industrialists with a knowledge of science rather than scientists with a knowledge of industry. Such a man will have a thorough practical knowledge of the industry itself in all its branches, and inter alia, some grasp of book-keeping and economics and some idea of engineering. He cannot reasonably be expected to be a highly trained chemist as well, but he should have some understanding of the scope and content of chemical science. There seems to be a shortage of such men, and the lack of them may be a serious handicap to the development of manufacturing industry in the near future. Educationists should consider this position. A laudable desire to produce a large number of trained chemists may cause us to overlook the fact that half a loaf is usually better than no bread. The chemical training for University entrance, while admirable as a basis for more advanced training, is not always suitable for those boys who will never have any more systematic training in the subject. Cases have occurred in which a school training in the rudiments of chemistry has enabled an industrialist to recognise a chemical problem and to call in a consultant in time to save trouble and loss.

Dr. Gardner then dealt with the organisation of our Institute. He mentioned first a problem common to all Dominion-wide societies, arising from our peculiar distribution of population, that is the lack of one centre clearly predominant in population and situation. The usual result is that the Wellington members come in for more than their share of the work, and the rest offer at least their full share of criticism. The proxy system at Council meetings has been helpful and the Journal should prove valuable.

We are all watching with interest the effort being made in Great Britain to bring the multiplicity of chemical organisations into closer relation. We should be wise here to take a broad view and regard our body as being approximately the local analogue of both the Chemical Society and the Society of Chemical Industry as well as the Institute of Chemistry of Great Britain and Ireland. We must always maintain the closest touch with other bodies in New Zealand and especially

the Royal Society of New Zealand. In Wellington the first purely chemical body was a section of the then Wellington branch of the New Zealand Institute, but it was impossible to deal with professional questions within that organisation, and our own separate body was formed. But just because the Royal Society has a broad basis, as many of our members as possible should take an active part in it. Contact with other branches of knowledge is the best prophylactic against a narrow outlook.

The three grades of members of our Institute, Fellows, Associates and Local members, give us an arrangement elastic enough for all needs if worked in the right spirit, but which may bring difficulties unless traditions are rightly moulded while the body is young. Everyone will agree that the associateship should be confined to properly trained chemists. The standard in general is that of an Honours degree. The standard of the Fellowship should be zealously guarded to represent a standard higher in chemistry than that of the Associateship, but no suggestion must grow that a Fellow is a being of a superior type. Associates are of two kinds, young people on the road to the Fellowship, and others who while thoroughly trained as chemists, are not pursuing the type of specialised career that leads to that goal. Many of the latter will be executives in industry. We need more of both types, in fact we are in urgent need of more men of the Industrial Associate type. Local members are also needed, people of good general status with enough interest in chemistry to be active branch members, including a full share in branch management. It should be clear that the distinction between the grades rests on grounds of systematic training in specifically chemical matters and on no other grounds.

Finally Dr. Gardner appealed to all who are eligible for membership in any grade to support the Institute now, even if they feel they are not getting much out of it. In this Centennial year, at a time when the world stands so sadly in need of broadly based co-operative effort, the time is opportune to ask members and potential members to support the Institute in every possible way. If in the difficult times ahead, we can as a nation, keep our heads, rise above the forces of habit and the catch words of propaganda, and apply to our thinking about national and world affairs some of that objectivity on which we, as chemists, pride ourselves, we shall have something well worth the doing. We must try to do our part both as members of the Institute and as individuals, as chemists and as citizens of a free and democratic Dominion.

DISCUSSION.

G. A. Lawrence supported the President's remark that manufacturers need help to indicate when and how chemists can be of use to them.

H. G. Munro said that of some 4000 who take chemistry at secondary schools, about 800 continue to the University, yet the school course is designed for that 20 per cent. Moreover many Stage I University students have done no chemistry, so that the subject has to be started at a more elementary level than is necessary in other subjects. Even then students with no school chemistry do as well as many with three or four years of it. He contended that school chemistry requires modification so that students going into industry have a grounding in simple general chemical principles.

Mr. F. J. Brogan instanced the schemes of the Dairy and Wheat Research Institutes for giving simple chemical training to those already in industry.

An Australian visitor, Mr. Booth, said that in their desire in Australia to give a general background of chemistry suitable for industry they had neglected the vital factor of the application of the broad training to industry. He mentioned the development of a new class of "chemist—engineer—business technologists" who are taking executive positions and are giving difficulty with respect to their membership of the Australian Chemical Institute.

THE METAL INDUSTRY.

(R. M. Bruce)

After a brief historical introduction, Mr. Bruce said that great advances have been made in metallurgical knowledge during the present century, arising mainly from two factors. The first is the development of technique in which the microscope has been used to view polished surfaces of metals, etched or not, by which means the inner structure of pure metals and alloys has been revealed. This study is known as Metallography. The other factor is the application of the principles of physical chemistry in studying metals and alloys and those peculiar combinations of oxides known as slags which are always associated with molten metals. Other factors are the development of pyrometry or accurate high temperature measurement, improvement in furnace design and the introduction of electric heating, and the use of rapid analytical methods for control. Among the latter was mentioned the use of the quartz spectrograph, once purely a research tool, now used to control the making of cast iron, steel and some non-ferrous alloys, and with which the usual constituents can be determined within ten minutes. By this means the metal can be held in the furnace for a short time while the composition of the alloy can be corrected. With these developments the control of the metallurgical side of the metal industry has shifted from the skilled artisan to the chemist.

The advance of the metal industry was made to meet the demands of engineering industries, on the virility of which the development of any country depends. Although one feels reluctant to say so, it must be admitted that the manufacture of ordnance and armament of battleship and aircraft has urged the engineering industry, dealing with these things, to advance. During the Great War research was needed through the dire necessity to keep at least level with the adversary. In the present struggle industry is being taught to avoid waste and to conserve raw materials and scrap. No country has a sufficiency of every raw material of the metal industry. Both sides are conserving available supplies of metals essential in war, aluminium, copper, iron, tin, lead, zinc, manganese, nickel, and chromium. Aluminium is the only metal absolutely controlled by the Government in Britain, since it is needed first and foremost for aircraft. Germany's greatest needs are iron and copper and to a lesser extent nickel and tin. She can get two-thirds of her requirements of lead, and all her aluminium, the necessary bauxite coming from Hungary and Jugo-Slavia.

Iron must give her some concern, since without going overseas, she can only hope for half her requirements, assuming full development of new deposits plus supplies from all Central Europe. Similarly she is limited to 40 per cent of copper needed, 65 per cent of lead and 60 per cent of zinc without overseas importation. Chromium, nickel, tungsten and vanadium, all needed for high grade steels are almost unavailable to her. Hence she conserved her metals under her four-year plan, and in the production of substitutes, chemists played their part. The magnesium industry was fully developed, displacing heavier non-ferrous alloys and also, partly, aluminium.

New Zealand has no large proved deposits of ores other than iron, and the metal industry is dependent on imports of raw materials. While it has not suffered any great set-backs so far, there have been hold-ups, and more serious ones are bound to come. We should like to find in the country copper ores, bauxite, stream or lode tin, galena, magnesite, chromite, manganese ores such as pyrolusite or manganite, nickel ores and zinc blende. One or two would be a great asset.

The possibility of developing the iron deposits of Onekaka and Parapara, and the iron sands on the Patea and New Plymouth coasts, have been widely discussed in the past year. The proposal is to establish blast furnaces for the manufacture of pig iron, partly for local consumption and partly for the production of basic Bessemer steel. Suitable dolomites for furnace linings are available in New Zealand. The process can be carried out either in a basic open hearth furnace or a Bessemer converter. For the former we require a proportion of steel scrap which may not always be available, and a small amount of fluorspar as a flux, which is so far not available. The Bessemer converter remains the only choice. Improved technique has overcome the old inferiority of basic Bessemer steel, and this process is the cheapest. A first class product can only be produced by paying close attention to the process at all stages. A fault in the early stages is not eliminated by correct procedure later. All plant should be grouped together in one place.

Most cast iron in New Zealand is melted in cupolas, although the air furnace is coming into use. Some of the cupolas have been altered in accordance with recent improvements to produce hotter metals. The electric furnace is used in one centre. In steel manufacture there are three small acid lined converters operating in the Dominion, producing from pig iron and scrap steel, a good class of converter steel which

makes good castings. Four electric furnaces are also working on scrap steel, producing straight carbon steel and a few of the lower alloy steels. Three of the furnaces are laboratory controlled.

There are, in addition, a number of small brass and aluminium foundries, at present without laboratories, but when special bronzes and light alloys come to be made here, these industries will have to pool their resources and establish a common laboratory in each centre.

DISCUSSION.

W. Donovan said that the chances of finding workable deposits of materials for a metal industry were steadily diminishing, the Otago sounds district being the only likely area not yet surveyed; and known deposits are mainly small and widely distributed. Hence we must interest ourselves in new methods of extraction from materials occurring here but at present unworkable, such as aluminium from clay, a problem being studied by countries lacking bauxite. The chances of developing a plastics industry should not be overlooked, especially if petroleum is found. Further, chemists should study patents relating to ores and refractory materials, since methods suitable for adoption here might already be on the files of some patent office.

T. A. Glendinning said that men with enterprise and capital were needed as well as workable deposits, and asked for information about copper, cinnabar, and pyrolusite. Mr Bruce replied that mercury is still being produced in New Zealand.

In reply to a question by M. Fieldes on the suitability of Onekaka ore for slag production, the lecturer said that the ore does not contain enough phosphorus for slag, and rock phosphate would have to be added.

Mr. H. F. Harvey gave a paper on the pharmaceutical and cosmetic industry. He discussed the central place of the analytical laboratory in the industry and described briefly the outstanding points in the preparation of a wide variety of products. Reputable firms today print the formulae of their products on the label, since it is not the formula but the method of incorporation of the materials which is secret. Mr. Harvey blamed the colleges for the lack of trained men for the manufacturing industries, stating that they turn out pure chemists and not practical chemists, and the manufacturers have to educate their chemists for some years to produce men capable of manufacturing goods in the shortest and cheapest way.

SYMPOSIUM ON FACIAL ECZEMA.

Contributions to a symposium on facial eczema were given by Dr. F. J. Filmer, Dr. I. J. Cunningham and Mr. R. E. R. Grimmett.

Dr. Filmer gave a survey of the problem and a resumé of work done in South Africa on apparently similar problems, with an outline of the lines of attack to be prosecuted in New Zealand. Facial eczema belongs to a group of diseases caused by the pathogenic effect of light of particular wave lengths on animals in a photosensitive condition. This condition may be due to the nature of the food eaten, as in "rape scald," to an inherited tendency as in some strains of Southdown sheep, or to an accumulation of photosensitive substances in the animal because of impaired metabolism and excretion. The Animal Research Division is concentrating on three main avenues of approach. First they are endeavouring, unsuccessfully so far, to induce development of the disease by simulating the climatic and growth conditions under which it is assumed to occur. Secondly they are trying to detect by chemical and physiological methods, disfunction of the liver developed under natural and controlled conditions at a stage preceding the acute stage of facial eczema. Thirdly they are seeking by analysis of the herbage from "safe" and "unsafe" pastures, to find the active causative agent.

Dr. Cunningham reviewed the problem from the biochemical viewpoint, paying particular attention to the influence of impaired liver efficiency on the accumulation of bile pigments in the blood. He reported on attempts made to induce liver damage followed by retention of bile pigments, by feeding animals with extracts of rumen, suspected pastures and various organic substances. The results were negative in all cases with the exception of aniline which is not known to occur in plants. Rimington and Steyn suggest phylloerythrin derived from the decomposition of ingested chlorophyll as the sensitising agent in animals affected in South Africa. Other photosensitive substances derived from a breakdown of the blood-pigments are under consideration at Wallaceville.

Mr. R. E. R. Grimmett, who has been in charge of the chemical investigations, detailed the work done on the analysis of samples from sound and suspected fields, showing the changes in composition and in the proportions of various

fractions which occur throughout the year. These changes were correlated where possible with meteorological and botanical data.

The subject of the symposium was one which was of great interest to members, and it is to be regretted that the time available for the presentation of the papers did not permit discussion. The material covered in the last two papers was extensive, and it is certain that many members would have welcomed an opportunity of giving their views on special phases of the problem as well as on the investigation as a whole.

HABER MEMORIAL LECTURE.

Members who do not normally see the Journal of the Chemical Society might be interested to have their attention drawn to the Haber Memorial Lecture by Professor J. E. Coates which is published in the November journal of last year. It is a fine tribute to a very great chemist which all chemists will appreciate. Some aspects of Haber's work are of special interest today. His contributions to his country's war effort in 1914 were not confined to the synthetic ammonia process, of which Professor Coates says that "rarely, if ever, had a process been brought in an academic laboratory to such an advanced stage of technical development before being handed on to industry." It appears that the (German) "army had tacitly assumed that industry would supply its needs in war as in peace time, and thus the mobilisation plans included no steps to ensure this. In the matter of basic materials, Germany was in fact ill prepared even for a short war." In this situation Haber was put in charge of the department of raw materials at the War Ministry. While he gave special attention to the fixed nitrogen problem, he was also engaged on toluene substitutes, gas warfare, the respirator, and finally in 1916, became chief of the Chemical Warfare Service. After the war he tried to help his country by developing a process for the recovery of gold from the sea, the final result of which was the discovery that the amount present is less than one thousandth of that originally assumed.

The man with this record of patriotic service felt compelled to resign his position as head of the Kaiser Wilhelm Institute for Physical Chemistry as a consequence of the anti-Jewish policy of the National Socialist Government. It may be that Germany today is not, in the matter of basic materials "ill prepared even for a short war." But a more important question may turn out to be, has she another Haber?

NEW ZEALAND INSTITUTE OF CHEMISTRY.

(Otago Branch)

At a special meeting of the Otago Branch on Thursday, February 15th, Dr. F. R. Meldrum spoke on his experiences abroad. Dr. Meldrum gained his M.Sc. degree at the University of Otago in 1934, and was then lecturer at the University of Otago for two years before proceeding to Bristol as the holder of a Michael Hiatt Baker Scholarship. At Bristol he carried out research under Professor Garner on the decomposition of nitrogen iodide with a view to elucidating the mechanism of the initiation of detonation, for which work he was awarded the degree of Ph.D. in 1939. Dr. Meldrum was then appointed to the staff of Imperial Chemical Industries of Australia and New Zealand, and, after spending last year with that company in England, he is now on his way to take up a position at the company's plant in Melbourne.

At a meeting of the Otago Branch on February 15th, the chairman congratulated Mr. George Gilbert on the completion that day of 25 years' service as Senior Laboratory Assistant at the Chemistry Department, University of Otago. Mr. Gilbert, popularly known as "Harry," will be remembered by former students as a guide, philosopher, and friend. He served for 3½ years with the N.Z. Forces, but otherwise has missed only a fortnight on sick-leave. He was a foundation member of the Otago Chemical Society, which later merged into the N.Z.I.C. Interviewed, Mr. Gilbert said: "I feel that I can count every student who has gone through the Department in the last quarter of a century as a personal friend. The fine spirit shown by these students has made my work happy and interesting."

The Editor,

Sir,

The presidential address delivered by Dr. R. Gardner in Wellington recently gives one facts which have all been obvious for many years past, that there appears to be an almost unsurmountable barrier between academic chemists and industrial men as a whole. The lack of co-operation has been to the detriment of the Institute, and it is imperative in these days of uncertainty that more good fellowship should exist. Today is a time of revolution, chemical revolution, the change over from rule of thumb methods to scientific control. This involves a more liberal and more extended interpretation of the word "Chemist."

In Dr. Gardner's remarks on the N.Z. Institute of Chemistry, he mentions three grades of membership: The Fellows, The Associates, and The Local Members. Why differentiate? Surely it is known to all Chemists that there have been many men in the world of science who have done remarkable work, yet had no academic qualifications. Would then, the N.Z. Institute put these men through the grader and pass them as grade three? And the laboratory technician, a most necessary man in industry, (no academic M.Sc.), he also would be amongst the lower grade. This appears to be another example of the academic man ruling from the lecture room. Men who are definitely in favour of class distinction (academically) and can only see their lecture class.

The man who can absorb and retain (parrot like) the lectures given is the man at the top. He is to become the Fellow or the Associate. I maintain this to be definitely against helping to build and maintain an institute worthy of that name.

Anyone who is helping Science in any way should be welcomed as an Associate. He should be made to understand that he is a part of a great organisation and that he himself is helping to build a structure on which all future scientific work in this country will depend.

Whereas, capital and labour may strive for supremacy, it is the chemist technical scientist, and all those men helping in the field of chemistry who will control the destinies of both.

Let us then appeal to all these men to join the N.Z. Institute of chemistry and welcome them on equal footing without equivocation, as Associates.

Yours faithfully,

G.L.