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EDITORIAL

"Chemistry and Industry" of February 3rd reports a lecture by J. D. Bernal on "The Application of X-ray Crystal Analysis to chemical problems." One of the contributors to the discussion "was moved to extol the superlative merits in industry of the physicist over the chemist."

From one standpoint this seems to us a very superficial view. If the sole end of the physical scientist in industry is to carry out analysis, it would have some validity, at any rate in the future, when physical methods will be improved and the necessary apparatus reduced in cost. But analysis is a means, not an end, and industry requires men trained to understand, so that they may improve and control the reactions it uses to effect its purposes. These reactions are studied in chemistry. The physical scientist required by industry needs then chemical training.

From another standpoint the opinion comes as a useful challenge to chemists. Many physical methods are now available which chemists are perhaps slow in adopting. The spectrograph, as R. M. Bruce reminded us at the Conference, is an invaluable tool in the metal industry. In this number we publish an article in which reference is made to large scale soil analysis in Germany based on physical methods. In theoretical chemistry today, it is very true, as a famous chemist (we think it was Bunsen) once said, "A chemist who is no physicist is no chemist." That is coming true in analytical and industrial chemistry as well. It means that the scope of the training of chemists continually extends. In discussions of that training in the various branches of this Institute we have heard demands for knowledge of engineering, knowledge of costing and accounting, knowledge of administration. Some of these we believe can be best learnt on the job. Better training in physics however, is clearly a task for the years of university study. We believe this is being achieved, and the close relation of physics and chemistry is being maintained and developed in our university colleges.

THE PRESIDENT.

Roy Gardner, D.Sc., F.I.C., F.N.Z.I.C.

Masterton was the birthplace of our President, where his father, the late Alfred H. Gardner, was a printer. After leaving the old Masterton District High School, he was apprenticed to the late Mr. H. T. Wood, pharmaceutical chemist. He qualified as a pharmacist and worked in that capacity in various parts of New Zealand for several years. It was natural that his keen mind should wish to enquire more deeply into chemistry proper. His University career began at Auckland, where he graduated B.Sc. in 1921. During 1922 he carried out research at Otago on the Essential Oil of Manuka (Leptospermum scoparium) and gained his M.Sc. with first class honours. From 1922 to 1933 he taught science at the King Edward Technical College, Dunedin, except in 1928 when he held the John Edmond Research Fellowship in Applied Chemistry at Otago University.

He obtained his F.I.C. at a special examination in 1927. In his spare time he had continued his work on the Essential Oils of native plants. This work was recognised by the University of New Zealand when he was admitted to the degree of D.Sc. in 1930.

It was rather a bold step when, in 1933, he commenced practice in Dunedin as a Consulting and Analytical Chemist. Certainly his broad training eminently suited him for this work, but readers well know the general lack of appreciation of the value of a trained chemist's services. Dr. Gardner, himself, discussed this matter excellently in his Presidential Address. It stands to his credit that he has proved to his clients the value of scientific advice and, as he once modestly remarked, "I am still carrying on."

Many members of the Institute will know that Dr. Gardner was actively engaged in its formation. He was a foundation member and an original Fellow. He has been a most enthusiastic member of the Otago Branch and without him no meeting would seem complete.

His connection with pharmacy has never been quite lost, as he has acted for about ten years as examiner to the Pharmacy Board, and in 1935 was President of the Pharmaceutical Section of the Australian and New Zealand Association for the Advancement of Science at the Melbourne meeting. He has been a member of the Board of Governors of the King Edward Technical College for five years, and is at present a vice-president of the Otago Branch of the Royal Society of New Zealand. He is keenly interested in economic matters, and was recently the author of "The Basis of Prosperity in New Zealand," a book which has been well received.

Since their marriage in 1924, Mrs. Gardner, who was formerly Miss Hazel Griffith, of Pahiatua, has taken a lively interest in her hubsand's many and varied activities.

CO-OPERATION AND CO-ORDINATION OF TECHNICAL SERVICES IN WAR-TIME.

(By J.A.B.)

Scientific men and chemists have definite responsibilities during the difficult times that we are facing. We are fighting an enemy, who, at the outbreak of war, closed half his universities whose achievements in pure and applied science, for which at one time he was famous, have been steadily degenerating. What the enemy stands for to-day does not constitute civilisation in any intelligible sense. The victory of this enemy would result in the closing of every cultural centre, including the universities, in the countries that came under domination. Science and civilisation would receive a severe blow from which recovery would be extremely difficult.

Whilst it is a sad state of affairs that technical development and achievement must, for some time to come, be more surely and more quickly aimed at helping the ends of force, the responsibilities of chemists are bound up with the maintenance, preservation and strengthening of the technical side of the organisation of the democratic mechanism which must endure as a social system for the defence of the well-being of civilised beings.

The technical services of chemistry and applied science, whether it be state or private enterprise, must be more coherent and elastic during these difficult times. A register of scientific and technical workers is not enough. Moreover, time is a factor of tremendous importance in connection with any technical developments for war-time needs.

At this time, when so much publicity is being directed to scientific ways and means of destroying life, it is still important not to let ourselves or the public forget that the greatest mission of true scientific men is still to save and not to destroy.

In the mercantile and manufacturing fields, many large firms regard advertising as a better way of earning profit than scientific research, and the smaller firms cannot bear the cost of what they regard as scientific research, and in addition to this there are other firms who are more interested in results which they can keep to themselves, than in information which has to be pooled among their competitors, even though this procedure might be of benefit to the Nation. Pooling of knowledge, co-operation between scientific technical workers, and chemists, apart from the essential goal of achievement, i.e. the further progress of science in its truest and fullest form, is absolutely necessary to bring a closer understanding of the relations existing between science and government.

It is interesting to note that business administration courses are being more widely advertised to chemists in Australia, for instance. Perhaps the time is not far distant when public administration will be included as a subject for a degree in science in the University curriculum.

The present civilisation differs from those preceding it in its remarkable material achievements, all of which have depended fundamentally on the scientific man whose voice is not often heard in connection with the running of the political affairs of the State.

Faced with the horror of scientific warfare, the scientist denies responsibility for the misdirection of his efforts, and naturally blames the politicians and big financiers for the mis-use of knowledge originally won for its own sake and for the good of mankind.

In spite of the indescribable mess that has resulted in this mechanical age, there is no other alternative for the chemist but to co-operate still further, and to strive for greater responsibilities, having in mind that his duty in war is to give all his energies and his brains, for the time being, to the preservation of our own little country, and the British Empire.

A still greater responsibility will undoubtedly follow in the peace period when the chemist and other scientific men will assist in delivering society from the chaos which its too great material success has brought about, especially when so evilly misapplied by politicians and dictators whose powers of concentrated evil became too deep-rooted before the average citizen of the world became aware of it.

In the present struggle for survival, lessons of co-operation must be learnt quickly. Chemists must contact and help each other much more, and all efforts towards carrying on valuable scientific research which is directed towards the production of the primary needs of food, clothing, shelter and the other necessary war-time materials and products, should be co-ordinated and improved without any sharp line of demarcation between governmental servant, private employee, or employer.

We must not, however, shut our eyes entirely to any method of organisation of technical services that can be learned from the enemy, especially when the supply of food-stuffs will play a still more vital part in the war issue as time goes on. A recent example of co-operative effort, in spite of the degenerate scientific tendencies of our adversary, was recently noted from an authoritative American technical journal as follows:—

"A national program has been developed in Germany for the systematic testing of soil by new photo-electric methods with a view to the more effective use of fertiliser for expanding soil productivity to maximum levels. The program provides for each of the 70 agricultural experimental stations situated throughout Germany conducting initially 25,000 soil tests annually, the number to be increased to 100,000 annually per station, as the program becomes well established. It is expected that it will be possible to rationalise the application of commercial fertiliser in accordance with the ascertained fertility of the soil, and in this manner further increase the productivity of German farm land.

"The conducting of soil-analysis tests upon such a large scale is said to be possible through the recent development of simple, inexpensive, but highly accurate testing methods by photo-electric means based upon the use of photo-electric cells and principles of spectral analysis. Tests can be carried out rapidly by trained workers and there is no need for tedious methods of chemical analysis."

Let us examine another instance of co-operation and organisation:—

It was pointed out last year, that organisation of research had proceeded further and at greater pace in France than in Great Britain. The French have co-ordinated research work in chemistry in the three branches of academic, governmental, and industrial research apparently in such a way that a research worker in one field can transfer from one branch to another. In particular, those engaged in the Government or in industry are given facilities for exchanging their normal duties for research work in the academic sphere.

New Zealand has a million and a half population, and the war effort of such a small population is necessarily restricted. Nevertheless, in the winning of the war, the utmost possible use of the technical services available must be made, and the sooner this is recognised by our political, business and military leaders the better it will be for New Zealand and the Empire.

NEW ZEALAND ASSOCIATION FOR HEALTH EDUCATION.

Members who heard or have read Mr. R. L. Andrew's address on "The Level of Scientific Knowledge in the Community," and who have read the article "New Food and Drugs Legislation" on page 116 of Vol 3—No. 4 of this Journal, will be interested to hear of "The New Zealand Association for Health Education." This organisation was recently formed in Dunedin, and it is hoped that branches will be formed in other centres in due course. Its objects are to promote the health education of the public, to promote original investigation, and to investigate quackery. The executive includes four Associates of the Institute.

It has been suggested that members visiting centres other than their own might wish to get into touch with branch secretaries, so that they may attend local meetings if possible. The secretaries are available at the following addresses:

Auckland: R. T. DANVERS,
C/o. Messrs Thompson & Hills Ltd., Nelson St., C.1.

Wellington: J. A. D. NASH,
Dominion Laboratory, Sydney Street.

Christchurch: L. H. BIRD,
Wheat Research Institute, Hereford Street.

Dunedin: M. V. B. KING,
Chemistry Department, Otago University.

MEMBERS WITH THE FORCES.

Acting-Captain M. S. Carrie, M.Sc., A.I.C., A.N.Z.I.C.
(By W.G.W.)

I first met Carrie in a chemistry tutorial class at Otago University. He was the tutor and as a holder of a Research Scholarship he intimidated us freshers with his learning. However, we soon discovered that beside being an exceedingly clever student he was a "damn fine chap" and when, in later years, we quaffed ale and discussed chemical problems together both impressions were confirmed. After graduating I was fortunate enough to get a job with Carrie at the Rennet Company in Eltham. Despite the fact that we were isolated in a small uninteresting town in a country district, thanks to Carrie's broad interests we had quite a good life. Much of our spare time was spent in the laboratory where, besides chemistry, we discussed and argued about music, philosophy, and even politics.

When I heard that he had gone to camp I was not surprised. During our political discussions he had always strongly expressed his hatred of Fascism in all its forms and in particular, showed his hatred of the suppression of scientific workers and thinkers in Germany. When our Government called for volunteers, Max immediately saw his chance to convert theory into practice and joined up, leaving with the first echelon as an Acting-Captain in the Engineers.

In conclusion I would voice the feelings of all who know him by wishing him the very best of luck and a safe return after an interesting and eventful period of service.

Keith William Rutherford Glasgow, who was elected an Associate in 1931, has held the positions of Science Master at Otago Boys' High School and King's School, lecturer in education at Otago University, and is now Principal of Scots' College, Wellington. He left New Zealand with the First Echelon with the rank of Capain, and has now been gazetted Major in Egypt.

N. J. Ellison and **W. Josland** of the Wellington Branch have gone into camp with the Third Echelon. Ellison is a graduate of Auckland University College, and after being employed at the Napier Hospital, has been assisting Dr. P. P. Lynch, Pathologist, of Wellington. Josland has been employed as biochemist in the Veterinary Laboratory at Wallaceville.

A. E. Blair, elected a local member of the Auckland Branch last year, took up, on May 7th, a course of training as observer and pilot in the R.N.Z.A.F. He is chemist to the Reid N.Z. Rubber Mills.

Members who join the forces and require leave of absence are requested to communicate with the Hon. General Secretary or their Branch Secretary to that effect.

BRANCH NOTES

AUCKLAND.

The Chairman.

The Chairman of the Auckland Branch this year is Mr. F. H. V. Fielder.

Perhaps few of us younger members who received our education in these days of bursaries and scholarships can appreciate the difficulties attending those who chose to take up the profession of Chemistry three or four decades ago. Notwithstanding the fact that eight years had elapsed since he left school, F. H. Fielder managed to attend night school and obain his matriculation; this was followed by a B.Sc. degree which he obtained while a part-time student, attending first the Victoria University and, later, the Auckland University College. For the past sixteen years he has held the position of Chief Chemist and Acid Plant Superintendent to the Challenge Phosphate Company of Otahuhu.

His association with the New Zealand Institute of Chemistry dates from the days of its inception, being one of the foundation members when the Auckland Chemical Society was founded in 1925. He was also partly instrumental in the amalgamation of the various Chemical Societies to form the New Zealand Institute of Chemistry in 1931; and since then has served on the committee almost continuously, in addition to serving on two special committees, one in connection with the proposed Code of Ethics and the other with the change of Rules of the Institute.

Mention should also be made of his election as an Associate of the Institute of Chemistry of Great Britain and Ireland in 1929, since which date he has maintained an active interest in that body, being Chairman of the N.Z. Branch during the years 1936 and 1937.

The first lecture of the current session of the Auckland Branch was held on Tuesday 23rd April, when Mr. A. J. Parker addressed those present on "Public Analysts, 1840-1940."

The subject was inspired largely by the fact of this being Centennial year, and also by Mr. Parker's long association with the profession of Chemistry, both in this country and also in England. Before coming to New Zealand he was engaged for several years in the analytical laboratories of both Messrs Burroughs, Welcome & Co., and Messrs Parke, Davis & Co. followed by several years in private practice in London. Mr. Parker spent thirteen years as Government Analyst for the City of Auckland and for the last twenty-five years has been in private practice in this city. He is therefore, from his wealth of experience, probably in a better position to deal with the historic aspect of analytical chemistry than most other chemists in New Zealand.

The speaker very logically developed the position from the year 1840, when extensive adulteration of food was carried out, to the present day, when, in all civilised countries, State Analysts, as guardians of the health of the people, help to maintain a very high standard of quality in all foods. The extent to which food was adulterated a century ago appears to-day amazing, and shows a remarkable ingenuity on the part of the adulterators. It was not, for example, uncommon to find coffee adulterated with one or more of the following: chicory, ground wheat, beans, peas, acorns and saw-dust, while red oxide of iron was quite frequently found in cocoa. Manufacturers unhesitatingly coloured confectionery with salts of copper, lead or mercury, or any available paint pigments, whilst milk and alcoholic liquors were watered according to the conscience (if any) of the vendors.

It was an uphill fight on the part of the food reformers in the face of both Government and public apathy, and indeed, the earlier food adulteration laws were passed not to safeguard the health of the people, but to recover revenue that was being lost in customs and excise duties. In these struggles, the Chemical Society, and later the Institute of Chemistry and the Society of Public Analysts, all played their part, until, today, it is no exaggeration to say that in most civilised countries of the world, food adulteration is negligible.

WELLINGTON.

The Chairman.

W. G. Hughson, the chairman of the Wellington Branch for 1940, graduated M.Sc. from Canterbury College in 1927, specialising in physical chemistry. During 1927 and 1928 he was National Research Scholar for the newly formed Scientific and Industrial Research Department, working on the low temperature carbonisation of blended New Zealand coals. In 1928 he was appointed Assistant Fuel Research chemist at the Dominion Laboratory, and for five years studied the yields on carbonisation of coals from various parts of the country. A small scale experimental plant for briquetting was obtained from England, and sufficient briquettes produced for carrying out locomotive trials. In 1932 he became chemist to the Waikato Carbonisation Company, which is engaged in converting waste slack coal into briquettes. When, in 1936, the Government initiated a survey of the coal resources of the country, Mr. Hughson was appointed to take charge of the chemical side of the investigation. Since his return to Wellington he has been active on the branch committee of the Institute.

Film Evening.

The first monthly meeting of the Wellington Branch took the form of a film evening. By courtesy of the Shell Oil Company, and of Sir Harry Batterby, High Commissioner for the United Kingdom in New Zealand, a programme of scientific films was screened. The Shell films, a series of documentary

films carrying no direct advertising, but prestige value only, were highly recommended by John Grierson, "father" of the British documentary films. In fact the director, Arthur Elton, of the Shell-Mex series, was chosen by Grierson for his knowledge and love of engineering. This enthusiasm for the machine doubtless accounts for the dramatic and interesting treatment that Elton gives to such a subject as the history of gears in "Transfer of Power," to the story of crude petroleum in "Oil from the Earth," to the function of suspension systems in "Springs" and the fight against fruit diseases in "Protection of Fruit."

Members commented on the outstanding nature of the films, and we wish to thank the Shell Oil Company of New Zealand for their loan.

CANTERBURY.

The Chairman.

T. W. C. Tothill graduated B.Sc. from Canterbury College in 1929. He is a master at Christ's College and is engaged mainly in the teaching of chemistry and biology. As will be seen from his chairman's address, of which an account appears below, he is particularly interested in the part played by science in general education, and is convinced of the importance of giving an adequate place to biology. He is a member of the Science Masters' Association, an organisation which is very active in England and whose members are very much alive in developing methods of science teaching. In addition to his teaching duties Mr. Tothill plays a large part in the other activities of his school, especially in sport. He is also well known in Christchurch as an active member of the Repertory Society.

Chairman's Address.

Mr. Tothill, in his chairman's address discussed "Science and Education." He said that he believed that just as a syllabus containing no science is unbalanced, so the teaching of one science to the exclusion of others is almost equally so. Physics, chemistry and biology should have allotted to them approximately equal amounts of time. We now realise the dependence of chemistry on physics, and biology on chemistry, and biology, as the science of life is of interest to us all. Science provides in the curriculum, unique opportunities for leading boys from the concrete to the abstract, for developing logical reasoning. Canon Wilson, one of the first headmasters in England to give science a prominent place in the school syllabus said, "Science is the best teacher of accurate, acute and exhaustive observation of what is. It encourages the habit of mind which will rest on nothing but what is true; truth is the ultimate and only object and there is the ever recurring appeal to facts as the test of truth. Science teaches what evidence is, what truth is."

After discussing the amount of time devoted to various subjects in pre- and post-matriculation years, Mr. Tothill pointed out that specialisation in science seems to be regarded as unfitting a boy for any occupations other than those of teacher and research worker, or the professions of medicine and engineering, and agriculture. Few recruits, if any, for public service in the administrative field come from the science side of the schools. Does this mean that science provides an unsatisfactory medium of general education, and are administrative ability and aptitude for science mutually incompatible? Science as an educational medium differs from the classics and history in that, from the very start of his specialised education, the student of the latter is taught to assess moral values. The assessment of motives, both good and bad, is an integral part of literary education, and the historian learns to record impartially the failures as well as the triumphs of human endeavour. In scientific education these things play little or no part, and we tend to base our training on a moral code far simpler than that which is deemed necessary for other walks of life.

We may ask ourselves how far scientists tend to take a more balanced view of human affairs than their neighbours. Whereas most scientists base their professional views on carefully weighed evidence, discounting expressions of personal bias, it must be confessed that in human relationships they do not show a markedly greater tendency to discriminate between facts and dogma.

On the relation of administrative and scientific ability, Mr. Tothill remarked that we cannot do two jobs at once, and the march of science is so rapid that if we are to keep up, there is no time for other things. There is no reason to believe that eminent scientists are less fitted for administrative posts than classical scholars or historians. We need, however, a broad basis, a wide curriculum and no specialisation till the University is reached. The day will come when a boy of fifteen will no longer have to decide which particular set of intellectual blinkers he must wear for the rest of his life.

With regard to the teaching of chemistry, the speaker said that pure chemistry is not an attractive subject to the majority, but chemistry, as applied to industry and everyday life has an immediate appeal.

OTAGO BRANCH.

Chairman :: Thomas A. Thomson

The Otago Chairman's interest in chemistry began in early High School Days, when he was fortunate in having a laboratory of his own. Always of an individual character, he found in microchemistry a subject of intense interest which was practically unknown in New Zealand in 1931. He was soon publishing the results of original research, which brought

him to the notice of Professor Feigel, the foremost authority on "Spot Analysis," who asked him to assist in the publication of "Microchimica Acta." By invitation, he is to contribute articles on microchemistry to a leading English technical journal. He has often expressed his gratitude for the really kindly interest shown in his work by Professor Feigel and Professor Emich. Mrs. Thomson, who is also an Associate of the Institute, has, for several years, collaborated with her husband in his researches.

On Wednesday, April 3rd, Mr. T. A. Thomson gave the chairman's address on "Some Odd Reactions," in which he dealt particularly with microchemical methods.

Dealing first with catalytic reactions, he remarked that these were often extraordinarily sensitive and were frequently specific for one catalyst.

Mr. Thomson then dealt with organic reagents for metals, and said that during the last ten years a large number of organic groups had been found which were specific for certain metals. Explaining the term "specific," he said that alpha dioximes reacted "specifically" with nickel salts to give a red precipitate, although a red colour was given by ferric salts. It had been known for a long time that compounds containing an N-H group gave insoluble compounds with silver ions. The investigation of many such compounds indicated that rhodanine showed promise as a reagent for silver. Then p-dimethylaminobenzylidine-rhodanine was found to detect silver at 1 in 2,500,000.

An elegant use for organic complexes, which were covalent compounds, depended on their extraction by organic solvents. In this way small amounts of cobalt could be removed from a large excess of iron. The concentrate could then be estimated colorimetrically.

Finally the lecturer mentioned various types of reactions. When a test-tube of cold water was dipped into a mixture of zinc and hydrochloric acid in the presence of insoluble or soluble tin compounds, and then held in a bunsen flame, a blue colour was observed. This was not due to tin hydride as was once thought.

Free alkali, in the presence of alkali sulphide, could be detected by adding thallous nitrate. The sulphide was removed as insoluble thallous sulphide and the free alkali was left, as thallous hydroxide was a strong base and soluble.

Mr Thomson concluded by urging that more research should be done by chemists outside Universities and Government Departments. He said that a lot of microchemical work could be done with a few pounds' worth of equipment.

"Protection against Poison Gases."

On May 1st, a lecture on "Protection against Poison Gases" was given by Mr. H. G. Woolman, who was a Home

Office demonstrator on A.R.P. before he came to New Zealand last year. The lecturer first referred to the use of burning sulphur and pitch in ancient times. Passing next to the last war, he said that the German introduction of the use of chlorine in the 1915 attack on Ypres had been so successful that the roads to the channel ports were open. Some members of the General Staff had actually seen the cylinders being unloaded, but had not realised their significance. The 12,000 tons of Mustard Gas used had caused 350,000 casualties—2½% were fatal. As one ton was capable of killing 45 million people, chemical warfare was seen to be most inefficient. On all fronts there had been 600,000 gas casualties (10% of the total casualties); but only 3% of these proved fatal.

Mr. Woolman then dealt with some aspects of the very comprehensive A.R.P. organisation in Great Britain. Its aims were to prevent panic by eliminating the element of surprise, to avoid casualties, and to maintain the industry of the country. Attacks from the air could use high explosives, incendiary bombs, or gas. For protection against high explosives, the A.R.P. services in England embraced the best known methods of building shelters. The effects of incendiary bombs could be reduced considerably by suitable methods, the best being to use long-handled shovels to transfer them into buckets containing a little sand, in which they were taken outside. Gas could be sprayed from aircraft or dropped in bombs. The authorities defined gas as "Any chemical substance, solid, liquid, or gas, used in war for its poisonous or irritant effects on the human body."

Passing on to deal with protection against poison gases, Mr. Woolman said that the methods of detection were not far advanced, but were being developed. He described the types of respirator used, in all of which the essential parts were the activated charcoal absorbent for the true gases; the wool, cotton fibre, or special feather pads to filter out smokes; and the valves. All war gases were removed, but carbon monoxide and dioxide were not.

Social Evening.

On Wednesday, April 24th, 24 members of the Otago Branch were the guests of Mr. T. A. Thomson (Chairman) and Mrs. Thomson at a social evening in the Tudor Lounge. On arriving each member was given one-third of a formula and was told to find the other two-thirds. Several conservatives were seen parading as free radicals and when these came together there was naturally a reaction. Then there were advertisements to identify, some of which precipitated a discussion on patent medicines. In the "smellimetric" test, candidates had to identify various essential oils, and most crashed badly on the "blank" test. A most enjoyable evening concluded with "Auld Lang Syne."

CORRESPONDENCE.

All communications for the Journal should be sent to Dr. H. N. Parton, Chemistry Dept., Canterbury College, Ch'ch.

Membership.

Sir,

In the March issue of the Journal I read with some interest a letter by G.L. on the admission of members to the Institute. Were the doors of the Institute opened as suggested by G.L. the very foundations on which the Institute is built would be destroyed and the good fellowship which is advocated as such a necessity would go with it. Membership of the Institute should carry with it a mark of quality and indicate to the manufacturer, the commercial man and the public in general that that person has passed certain examinations or has complied with certain conditions which recommend him as one who may be engaged with confidence. Membership of the Institute is, or should be, a hall mark. The object of the New Zealand Institute of Chemistry should be to keep the status of its members on a parity with members of similar institutes in other parts of the British Empire so that, like the older established bodies, membership will attain an international value. The mere fact of being a holder of a university degree in science does not necessarily indicate a competence in the practise of chemistry but the additional membership of the Institute provides more concrete evidence to that effect. One has to experience the advantages of membership of one of the older institutes to appreciate its value from an international point of view. Foreign authorities have more ready access to the registers of the various chemical institutes in order to check the status of persons practising chemistry and therefore more readily accept the work and opinion of such members than would otherwise be the case. One is ready to concede that there are many who hold no degrees or diplomas, yet by reason of their training under some competent person in a well equipped laboratory are competent, and in many cases, of considerable ability. It is only by experiencing the advantages of a training under a competent chemist in a well equipped laboratory that one is able to gauge the advantages. Such a training, in conjunction with a regular academic course is the ideal. Much of our learning must always be "parrot-like" but as the human being has a better memory and reasoning power than that worthy bird, much of that type of learning is stored away on memory's shelves to be brought down and dusted as circumstances warrant.

Far from the academic man ruling from the lecture room, in my opinion the academic people, and by that I refer particularly to the professors and lecturers in chemistry in the various colleges, do not take all the interest they should in the affairs of the Institute. Some few have taken a keen interest right

from the inauguration but others have done little or nothing to further its interests. Let it be remembered that their job does not, or should not, end in the lecture room. They are training men and women, not for the teaching profession alone, but men and women who go out into our industries and who, by virtue of their training, should not only be the scientific workers and advisers in industry, but also the potential executives in industry. In chemistry, more than in any other science, the seed which gives rise to advance in industry is sown in the lecture room and laboratory and nothing should be done to discourage our university teachers from taking their part in the affairs of the Institute.

Yes, let us by all means appeal to these men, whom your correspondent has in mind, to join the Institute but let them all be made to comply with the standards before being admitted. If there are so many whose training and experience entitles them to membership, surely they are capable of complying with one of the standards for admission. Let us keep the standard up rather than let the status of the Institute down.

Yours faithfully,

——— G. A. Lawrence.

The Editor,

Sir,

In the last Journal, the Presidential Address and the letter from "G.L." raise a point which calls for consideration.

Dr. Gardner referred to the extension of scientific influence in our present and prospective manufactures It is not industries with a scientific history such as acid making or synthetic plastic production which appear to present any difficulty, but those concerned with such things as the making of foodstuffs or clothing in which an empirical art is usually far ahead of whatever theory may exist. It is urged that, to begin with, the extension of science to this class of industry can best be promoted by the appropriate training of young workers engaged in actual manufacturing, rather than by the introduction of a University graduate. Such workers would have a sense of proportion difficult to acquire rapidly by a newcomer, and of prime importance to their employer, their cost would be readily assessed and moderate. They, provided their temperaments and characters were suitable, would certainly make their influence felt. A newcomer equipped with strange knowledge coming among a group of workers, usually is regarded as dangerous and viewed with hostility.

Dr. Gardner appears to support this view, as on page 7 he says "It is likely we will have to rely mainly on industrialists with a knowledge of science rather than scientists with a knowledge of industry." This is certainly the trend. Even in New Zealand a scheme for the education of technologists in the refrigeration industries has been discussed recently.

This is a plea that our Institute should make provision for the recognition and encouragement of such workers and

consider the matter of their training which should not be merely chemical. Activity in this direction would strengthen the Institute and benefit members of all "grades."

Yours truly,

L.P.S.

THE USE OF DIETHYL ETHER IN THE DETERMINATION OF FATTY MATERIAL IN FEEDING STUFFS.

To The Editor,

Dear Sir,

Some time ago we found it difficult to explain the fact that in the analysis of the same sample of meat meal or liver meal this laboratory invariably obtained a slightly higher fat value than that obtained by a noted English public analyst. Eventually this discrepancy was traced to the fact that we were not taking sufficient trouble in excluding moisture. It has since been found essential, not only to thoroughly dry the sample to be extracted, but also to ensure that the diethyl ether is completely anhydrous.

Diethyl ether as commonly purchased, often contains an appreciable amount of water in solution. It is stated that one hundred volumes of ether will dissolve three volumes of water at 20°C. This water can most effectively be removed by refluxing the ether over dry pellet or flake caustic soda for about ten hours; the final traces of water being then removed by allowing the ether to stand over sodium metal until bubbles of hydrogen cease to be evolved. After distillation a sufficiently pure anhydrous ether is obtained.

Having discussed the matter with other chemists, we feel that this point has not been properly appreciated, and therefore a few comparative figures are given below. These figures are typical and are sufficient to illustrate the necessity of carrying out fat determinations under anhydrous conditions.

Sample	% Fat Anhydr. ether sample dried	% Fat Anhydr. ether sample not dried	% Fat Ether not dried sample dried	% Fat Petrol ether sample dried
Meat Meal (1)	9.66	—	10.51	—
Meat Meal (2)	9.55	—	10.25	—
Meat Meal (3)	9.94	11.12	10.92	9.88
Liver Meal (1)	16.97	18.97	18.04	16.78

In the last column the petroleum ether extracts are given for two of the samples and are seen to be in reasonably close agreement with the correspondingly anhydrous ether figures.

In these determinations the samples were continuously extracted in a Soxhlet apparatus in Alundum thimbles for 10 to 12 hours, and the fatty extract dried in the oven at 109°C. for three hours.

The sample of meal itself was dried in the same oven for four hours prior to extraction.

Yours faithfully,

R. T. Danvers.

The Editor.

SALARY SCALES

Dear Sir,

Recently the Australian Chemical Institute published a salary survey of chemists throughout Australia and it occurred to me that the following table would be of interest to New Zealand chemists. It demonstrates how underpaid is the average industrial chemist, both in private enterprise and public service, taking into consideration the great value his services are to the community and the amount of study necessary to qualify him for his position and also to keep him up-to-date. In many instances one chemist can be indirectly responsible for thousands of pounds saved to the community and in the case of private enterprises, in 75% of cases is responsible for the greater part of the company's profit.

It would be interesting to hear other members' views on this subject.

Yours truly,

H. Harvey.

Salary £	Under 100	100 – 150	151 – 200	201 – 250	251 – 300	301 – 350	351 – 400	401 – 450	451 – 500	501 – 550	551 – 600	601 – 650	651 – 700	701 – 750	751 – 800	801 – 900	901 – 1000	1001 – 1250	1251 – 1500	1501 – 2000	over 2000	Total
Age 21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-25	1	3	—	4	11	12	10	9	4	—	—	—	—	—	—	—	—	—	—	—	—	54
26-30	—	—	—	2	3	9	16	14	9	8	2	1	—	1	—	—	—	—	1	—	—	66
31-35	1	—	—	—	6	5	13	25	20	14	10	5	1	4	2	5	1	2	1	—	1	116
36-40	—	—	—	1	5	—	7	10	15	8	6	7	3	—	2	4	8	5	2	2	1	86
41-45	—	1	—	—	1	1	1	4	9	11	6	2	2	3	1	3	4	2	2	2	—	55
46-50	—	—	—	1	—	2	3	1	3	6	9	5	5	3	4	1	3	2	1	—	4	53
51-55	—	—	—	—	1	1	1	—	7	1	4	4	—	3	3	2	1	3	1	—	2	34
56-60	—	—	1	—	—	—	4	1	—	1	2	1	2	3	1	1	1	3	1	1	4	27
61-65	—	—	—	—	—	—	—	1	—	1	2	—	1	1	1	—	1	1	—	—	—	9
Over 65	1	—	—	—	—	—	—	1	—	—	—	—	1	1	—	1	—	1	—	—	1	7
Total	3	4	1	8	27	30	55	66	67	50	41	25	15	19	14	17	19	19	9	5	13	507