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EDITORIAL

We publish in this number the alterations to the Rules of the Institute which have been drafted by the Committee of Otago members appointed by the Council for this task. We believe that the changes suggested will enable the Institute to profit by the experience gained during the decade of its existence, and the fact that they are relatively few is a tribute to those who originally formulated the Rules of a body which has the problems peculiar to an isolated community. The privilege of honorary membership will be one, we are sure, that will not be lightly given. The increase in the number of Council members which is recommended should enable that body to retain the direct services of its most valuable members for a number of years, if the succession of Vice-President to President to Immediate Past President becomes the normal practice.

Any changes which encourage country members to increase in numbers is welcome. More important however, even than that, would be the development of some means by which country members could play a larger part in the Institute's activities. This is not primarily a matter of Rules, but if the suggested rule results in country members being directly represented on the Council, it may go far to promote a very desirable development. The same may be said of the rule relating to local members, who should provide a link between the Institute and many industries which involve the application of chemical knowledge without actually needing a qualified chemist on their staffs.

ALTERATION TO RULES.

Drafted by Special Committee, Dunedin, 1941.

The principal changes suggested are:—

(1) Provision is made for election of Honorary Members.

(2) The Council is enlarged by the addition of the Immediate Past President and a Vice-President. (It is thought probable that in practice the Vice-President will usually be the next President, thus avoiding the present clumsy procedure for nominating the President-Elect).

(3) Provision is made for country members or other persons who may wish to be members of the Institute but do not desire to be members of branches.

(4) The position of Local Members is more clearly defined.

Rule 5, 1st paragraph, to be altered to read:

"The Institute shall consist of three classes of members who shall be designated Honorary Members, Fellows, and Associates respectively."

Rule 6, 2nd paragraph

"and" to be inserted before "if"

Following new rule to be inserted after Rule 9, and subsequent Rules renumbered:

HONORARY MEMBERS.

10. The Council may elect as an honorary member, either for life or for such period as the Council may determine, any person who has given specially meritorious service to the Institute or to the science or profession of Chemistry, and such person shall then, for such period, be entitled without subscription to all privileges of membership, provided however that election to Honorary Membership may be made only by the unanimous vote of the Council after consideration by the Membership Committee. Any person, who at the time of his election to the Honorary Membership, was a Fellow or Associate of the Institute shall be entitled during his Honorary Membership, to continue to use the designation of Fellow or Associate and to enjoy all privileges of a Fellow or Associate as the case may be.

Following to be substituted for the present Rule 12:

THE COUNCIL.

13. The management of the Institute and the custody and control of its funds and property shall rest in a Council which shall consist of the President, the Vice-President, the Immediate Past President, the Branch Delegates and the General Secretary-Treasurer. The President shall act as Chairman at all meetings of Council, or in his absence the Vice-President, or in the absence of both the Immediate Past President, and in the absence of all these the meeting shall elect its own Chairman. The Council shall cause minutes . . . . duly called and constituted (as in present Rule 12).

ELECTION OF OFFICERS.

14. The President, Vice-President and General Secretary-Treasurer shall be members of the Institute and shall be elected by the Council at the last ordinary meeting of Council before the first day of December for twelve months, but shall be eligible for re-election. At the election of the above officers the General Secretary-Treasurer shall not vote.

If the President be re-elected, then at the following election

the Vice-President shall be deemed to have been nominated for the office of President.

The Immediate Past President shall hold office until a new President takes office.

Any casual vacancy in the office of President, Vice-President, or General Secretary-Treasurer shall be filled by the Council, but the Officer so appointed shall hold office only for the unexpired term of his predecessor.

(Following rules to be re-numbered)

Present Rule 20 to be amended as follows:

substitute for 1st paragraph—

BRANCHES.

22. Branches shall be constituted as follows:—Members of the Institute resident within thirty miles of the Chief Post Offices of Auckland, Wellington, Christchurch, and Dunedin respectively shall constitute the Auckland, Wellington, Christchurch and Dunedin branches, provided however, that (a) any member resident within the above limits may by written notice addressed to the Branch Secretary resign from the Branch without ceasing to be a member of the Institute; (b) any member outside the above limits on application to any Branch may be elected a member of that Branch, and (c) members of branches (at date of adoption of amended rule) shall continue to be members of such branches pending resignation as above.

Substitute for 4th paragraph:

Each Branch shall have a Chairman, a Secretary-Treasurer and a Committee consisting of the Chairman, Secretary-Treasurer and four ordinary members who shall be elected by and from the members of the branch at the Annual General meeting of the Branch, and one member of the committee shall in each year be elected by the Committee of the Branch as the Branch Delegate. The elections shall have effect from the first day of December next following.

Substitute for last paragraph:

Any Branch Committee may elect as a Local Member any person who in the opinion of the Branch Committee is of good character, is interested in Chemistry and is not eligible as an Associate of the Institute. A Local Member is a member of the Branch but not of the Institute. He shall have the right to attend Branch Meetings and to be elected to office in the Branch, provided however, (a) Local Members are not eligible for election for Branch Chairman or Delegate to Council; (b) not more than two local members may be members of a Branch Committee at one time, and (c) a Local Member may not vote at a Committee or General Meeting on any motion involving a recommendation to Council as to the fitness or otherwise of any person to be a member of the Institute in any grade of membership, or a recommendation as to change of rules of the Institute.

DUTIES OF BRANCH COMMITTEES.

Add after present sub-paragraph (d):

(e) To cause to be compiled a Roll of Members of the Branch with their addresses and such other particulars as the Council may require, a copy of such Roll to be deposited with the General Secretary-Treasurer and all alterations or amendments to be promptly notified to the General Secretary-Treasurer.

(f) To cause to be collected and forwarded to the General Secretary-Treasurer the subscriptions to the Institute of members of the Branch.

Present second-last paragraph to be omitted and final paragraph to be altered to read as follows:

Any Branch may, by resolution made at a General Meeting after notice of motion has been given, not less than seven days before the meeting and has been circulated with the notice calling the meeting, raise funds by special subscription from its Branch Members, including Local Members and such funds shall be at the absolute disposal of that Branch.

Insert new rule as follows:

COUNTRY MEMBERS.

23. All members of the Institute who are not members of Branches shall be classified as Country Members and the General Secretary-Treasurer shall keep a Roll of such members. Country members shall have the right to be represented on the Council by a person having all the powers of a Branch Delegate and elected by the following procedure:—

At any time prior to the 1st November in any year, any two Country Members may by writing, addressed to the General Secretary-Treasurer in such form as may be prescribed by Council, nominate any member of the Institute to be their Delegate. If more than one such nomination is received the General Secretary-Treasurer shall hold a postal ballot among all country members and the person receiving the largest number of votes shall be elected. If only one nomination is received before 1st November then the person nominated shall be declared elected. The Delegate so elected shall hold office for one year from 1st December.

Following Rules to be renumbered.

Present rule 21, paragraph 8, (Chairman of General Meeting) to be altered to read:

The President of the Institute shall preside as Chairman at every General Meeting of the Institute, but if the President be not present the Vice-President shall so act, or if neither the President nor the Vice-President then the Immediate Past President shall so act, or if none of those officers be present then the meeting shall elect its own Chairman.

COUNCIL MEETING, AUGUST 15th, 1941.

Present: Dr R. Gardner (President), Messrs F. H.V. Fielder (Auck.), G. S. Lambert (Wgtn.), Dr M. M. Burns (Canty.), Professor F. G. Soper (Otago), Messrs R. L. Andrew (Canty. Proxy), P. White (Auck. Proxy), R. M. Bruce (Otago Proxy) and J. A. D. Nash (Secretary).

It was reported that there should be no difficulty in the matter of import of any particular chemicals, if put through the proper channels with full details and if import licenses are available. Rising prices overseas will cause some reduction as licenses are on a value basis. Some materials have been queried on the basis that they were available in New Zealand. If special quality is specified orders will go through.

A letter was received from the Veterinary Association asking for co-operation of the Institute in the formation of an Agricultural Association. It was felt by Council that the objects set out would be better met by bi-annual conferences of the Royal Society.

Dr. Muriel Bell, Dr. J. K. Dixon and Messrs L. W. Ruddle and P. R. Parr were elected to the Fellowship. Special reference was made to the fact that Dr. Bell was the first woman Fellow.

The following Associates were elected: Messrs G. W. Stace and I. S. Hunt (Auckland), Messrs G. C. DeAth, K. S. Birrell, R. C. M. Stewart and L. W. Jagger (Wellington).

It was ruled that subscriptions would be accepted at the reduced rate provided they were posted before 1st July.

Council expressed its appreciation and thanks to Dr. Parton for his services as Editor of the Journal. It was decided to make the Journal available to Local Members through the Branches at 2/6 per annum and to urge Branches to make the necessary arrangements to supply as many local members as possible. It was decided to endeavour to make arrangements with the Australian Chemical Institute for branches to receive their Journal in a return for copies of the New Zealand Journal.

It was resolved to adopt the syllabus and standard of the practical examination for Associateship of the Institute of Chemistry of Great Britain and Ireland for this Institute's Practical examination for its Associateship. A fee of £3/3/- will be charged for the examination.

Applications for leave of absence were received from members of the Institute working on munitions in Australia. It was decided, in view of the fact that these members are actively engaged in their profession and are drawing benefits from their membership, that the applications be not granted.

A motion expressing appreciation for what the Australian Chemical Institute has done for members who have gone to Australia was passed.

Council decided to approach the University of New Zealand and the Professors of Chemistry in regard to the possibility of including some reference to Industrial Chemistry of interest to New Zealand in the Stage III Course.

It was decided to hold the next Conference in Wellington during August, 1942.

The attention of Council was drawn to an advertisement in the Press calling for applications for an Assistant Chemist in the Government. The salary offered was £225 for a B.Sc or M.Sc. with 2nd Class Honours and £255 for a M.Sc. with 1st Class Honours. These salaries were considered insufficient and it was decided to take the matter up with the Public Service Commissioner.

BRANCH NOTES

AUCKLAND.

The Auckland Branch was privileged to hear one of the most interesting addresses for some time when, on Monday, 19th May, Sir Theodore Rigg, Director of the Cawthron Institute, spoke on Soil Deficiencies in the Nelson District. There was a large attendance including visitors from the Land Development Division of the Lands and Survey Department, the State Forest Service, the Plant Diseases Division of the Mt. Albert Research Station, and the Humic Compost Club.

Sir Theodore opened his address by illustrating the geological and topographical structures peculiar to the district. The nature of the underlying parent rock determines which of the minor elements is likely to be deficient. By knowing the geology of the district one knows which of these elements is likely to be lacking and a great deal of work of a trial and error nature is avoided. Cobalt deficiency occurs in the acidic rocks of the Morton Mains district and the great pumice areas in the Central North Island. It is interesting that in areas overlying similar rocks where Cobalt deficiency was expected no "bush sickness" was recorded for a long time, but just recently reports have come in showing that these areas are behaving similarly to other acid regions.

In a discussion on the effects of different combinations of phosphorus, nitrogen, potash and lime on the growth, yield and keeping qualities of apples, an interesting (and often overlooked) point is that it takes at least four years before the real effect is made manifest. Too many erroneous conclusions have been drawn from judging the effect of a manure over one or two seasons, in connection with pasture growth and crop yields.

Leaving the realm of the major elements, Sir Theodore dealt in turn with the minor minerals whose deficiency has

been studied in the Nelson district. These are Cobalt, Magnesium and Boron.

Much has already been published on the relation between Cobalt deficiency and "bush sickness" and the farming community has been very responsive in making practical use of the findings in this connection, helped of course, by the manufacturers of Superphosphate who have been incorporating small amounts of this element. Unlike magnesium deficiency, lack of Cobalt does not show itself in any poorer pasture growth and no indication of its deficiency can be gauged by the growth or colour of grass which can look very healthy on Cobalt deficient soil.

Magnesium and Boron have a very pronounced effect on the growth of apples and irregularities in growth and yield have been traced to the lack of one or other of these elements Turnip and the other root crops are very susceptible to Boron deficiency, which strangely enough, has only been recorded in two other parts of the world besides Nelson.

Throughout, the address was very fully illustrated by lantern slides illustrating the various points discussed, together with graphs and data showing the effects of remedial treatment, and at its conclusion, the number and variety of questions asked bore tribute to the interesting manner in which the address was delivered.

On Tuesday, 24th June, 1941, the speaker for the evening was Mr. K. M. Griffen, Government Analyst for Auckland, and the subject was, appropriately, "Forensic Chemistry."

Mr. Griffen referred to the vast libraries of specimens that the large overseas laboratories keep, in which samples of grass-seeds collected from every part of the country, samples of the glass from the head-lights and wind-screens from every make and model of car, and every available kind of wood, paper, and tobacco are kept. Specimens of writing from all the leading makes of type-writers are filed away, together with the finger-prints and photographs of all criminals who have passed through the courts.

In police cases much of the work of a laboratory involves the microscopic examination of very small pieces of dust, glass or fibre. In some cases the clothes of the accused are treated with a vacuum cleaner and the resultant dust examined. In the case of a man who had cut through painted iron bars with a hack-saw, specks both of paint and of iron filings were found. A safe-blower's clothes usually reveal some of the insulating powder used to make the safe fire-proof, whereas a motor accident often results in small easily recognised splinters of glass being left in the clothes of the driver or on the victim

of a hit and run case. The clothes of anyone who has been engaged in the manufacture of counterfeit coins invariably contain filings of the metals used, and provides useful evidence.

The examination of glass fragments is capable of very accurate determination in both specific gravity and refractive index and has had wide application in the case of motor accidents. Both of these determinations are made by means of mixed solvents.

The examination of fibres plays quite an important part as they can often be identified. A person leaves threads of his clothing behind him wherever he goes, especially after any encounter such as being hit by a car or being assaulted. The microscope may then be used to compare these threads with the clothes of a suspect. Human hair cannot be positively identified as from any particular person or race. Clay also has played its part in tracking down criminals as the diatoms and foraminifera present may indicate the locality from which the clay came and may show the movements of the suspect.

The examination of documents and inks is a specialised science and capable of wide application. For example, where writing has lain in contact with plain paper, as a letter inside an envelope, it is possible to develop the writing on the plain paper or envelope. The age of the ink is capable of determination and may indicate additions or alterations to a document. Also it is possible to restore the original writing on a piece of charred paper. People often gain the impression that a typewriter will conceal their anonymity moreso than hand writing. Actually this is quite erroneous, as the writing from every machine reflects its small individualities in the same way as bullets do from a rifle. No two typewriters write exactly the same, as the microscope will reveal very small irregularities in the letters, their level or their spacing. Rifles, likewise, all leave a certain type of scoring on the bullets or a peculiarity in the impression of the firing pin on the cartridge case, which may lead to identification.

When numbers stamped on metal or wood have been erased by filing and polishing, it is quite easy to redevelop the markings by certain etching ink. Finger prints were briefly dealt with. The latent impressions on paper are developed by painting with silver nitrate and exposing under ultra violet light, or else a dust is used which is a different colour from that of the material on which the impression has been made. In the case of a multi-coloured background a fluorescent dust is employed.

Mr. Griffen emphasised that in most of this work no highly complex principles are involved, in fact most of the police work involves everyday laboratory operations, but that success lies rather in being painstaking, patient and thorough to an extent often not required in ordinary work.

WELLINGTON BRANCH.

The May meeting of the Branch took the form of a members' evening, and the chairman, Mr. J. B. Hyatt, presided over a good attendance.

Dr. Davies opened the series of lecturettes for the evening by showing a method of filter-paper folding by which air bubble trouble is avoided, viz. by tearing off the corner of the double side of the filter paper.

His second exhibit demonstrated a very efficient method of leaching soils. Features of the device were its automatic operation over a long period, and the leaching of all types of soil at the same rate.

The third demonstration was the estimation of carbonate in limestone by a very rapid method suitable for use in the field, in which the per cent. carbonate was measured directly by the amount of water displaced by CO_2 on mixing the limestone with acid.

The determination of vanadium by phosphotungstate was described and demonstrated by Mr. E. P. White. The method was a colorimetric one, a pure yellow being formed, which had however, to be matched rapidly as flocculation occurred in a short time. The method was not affected by titanium, was quick, and more accurate than the conventional H_2O_2 method.

Mr. M. L. Stewart described a method whereby the laboratory tests of used oils could be correlated better with road performance than is usually the case with used oil analyses. Compounds termed "rosins" are isolated from the portion of the oil soluble in petroleum ether by means of absorption by activated earth. The "rosins" are then recovered from the earth by means of benzol, and the benzol removed by distillation.

Dr. F. B. Shorland showed the model of a piece of apparatus for the continuous extraction of unsaponifiable matter from fish oils. With these oils the extraction is extraordinarily difficult and normal separating funnel methods are unsatisfactory. The apparatus included a still, condenser, and extraction vessel fitted with a sealed stirrer. The mixing of the ethereal and aqueous phases with the stirrer contributed largely to the success of the method.

The preparation and handling of tungsten hexachloride out of contact with air was described by Mr. D. H. Freeman. A diagram was used for the description and the speaker explained the method for removing the oxychlorides $WOCl_4$ and $WOCl_2$ which were formed initially, and the subsequent collection of the pure hexachloride which, when dissolved in a suitable solvent in the same apparatus, was ready for use in further reactions.

Mr. G. A. Lawrence showed apparatus for testing enclosed spaces, such as ships' holds, for inflammable gas. Mr. Lawrence

graphically described the pleasures of exploring double bottoms, and the taking of test samples to safeguard the repair gang.

A new method for determining soil colour was exhibited by Dr. J. K. Dixon. The apparatus consisted of a small electric motor with a metal disc with 100 divisions round the rim, mounted on the shaft. In front of this disc, four paper Munsell discs coloured red, white, black and yellow were arranged so that on rotation of the disc, any shade of colour derived from the four primaries could be produced at will. The ground soil samples were glued to small paper discs and mounted in front of the Munsell discs whereupon matching could be carried out.

Mr. Elphick described from a blackboard drawing, an apparatus for delivering CO_2 at constant speed. Many interesting devices were incorporated, and the absorption apparatus for the determination of CO_2 to be used with the control apparatus was also shown.

The Chairman moved a vote of thanks to the speakers and directed attention to the several pieces of new and novel apparatus also on exhibition.

The June meeting was addressed by Sir Theodore Rigg, who spoke on "Soil Deficiencies in the Nelson Province."

Sir Theodore, after illustrating the main valley systems of the Nelson Province by means of lantern slides, continued with the aid of the slides to show how the Cawthron Institute had been able by chemical research to find such remedies for the soil deficiencies that apple-growing in particular and also the growing of other crops had changed what was an almost hopeless situation to one of outstanding success.

That the district, with its good climate and modern methods of soil fertilisation, is proving a monument to the effort and ingenuity of the chemists of the Cawthron Institute, was heartily endorsed by speakers at the close of the meeting.

CANTERBURY BRANCH.

The May meeting of the Canterbury Branch was addressed by Mr. G. J. Warren of A. C. Nottingham Ltd., on "Industrial Disinfectants."

Mr. Warren opened his address by stressing the importance of our accumulated knowledge in this field for the prevention of the spread of infectious diseases. Defining the meaning of the terms employed in the study of germicidal action he then outlined very briefly the history of the subject to the work of Koch and his co-workers and the important contributions of Kronig and Paul.

Various methods employed in the testing of germicidal agents and processes were then discussed, including the earliest recorded attempt to establish a germicidal "co-efficient" by

Sir John Pringle in 1752. The "Silk Thread" method of Koch, the "Garnet" method of Kronig and Paul and an interesting physico-chemical method for testing the antiseptic power of chemical agents due to Lessing and Schryver, were discussed and their disadvantages indicated. The important standard test of Rideal and Walker was outlined and the various criticisms of the methods were considered at some length. These criticisms concern either the technique of the test or the fact that the test is carried out under ideal conditions which have no comparison with the conditions encountered in practical disinfection. Attempts to meet these criticisms were discussed, particularly with regard to the introduction of organic matter into the test, and the Chick-Martin technique incorporating organic matter was thoroughly described, as well as several other modifications of the Rideal-Walker test.

The importance of using a standard test organism was demonstrated by reference to the results of tests employing organisms other than the standard B. Typhosus and the differences obtained by employing different strains of the same organism, S. Aureas, was demonstrated by reference to the work of Reddish.

The more important industrial disinfectants were then dealt with and their uses and limitations examined. In this connection a table illustrating the effect of organic matter on the co-efficients obtained in the standard Rideal-Walker test and employing various disinfecting agents clearly demonstrated the lecturer's conclusions.

Among the disinfectants dealt with, the hypochlorites, mercuric chloride and the Coal Tar disinfectants were the materials receiving most attention. The hypochlorites, although widely advertised, have serious disadvantages inasmuch as their co-efficients are reduced very considerably in the presence of even small amounts of organic matter. They are however, ideal for some practical purposes such as sterilising swimming-bath water and for food factories where absence of objectionable after taste or odour is important.

Industrially, the Coal Tar disinfectants are the most widely used and their chief characteristics were dealt with, together with the methods employed in their manufacture. Mr. Warren described the two chief products, "White Fluids" and "Black Fluids" and mentioned the conditions under which either is to be preferred, although the co-efficients of both fluids could be adjusted to equality. The small effect of organic matter on these materials was pointed out and also the co-efficients obtained with them against different organisms. Since disinfection is frequently carried out in conjunction with cleansing operations the effect of soap on these agents was mentioned and the superiority of Black Fluids over White Fluids in this connection explained.

A brief outline of the various theories of disinfectant action concluded an interesting session.

Mr. Duncan, of New Zealand Breweries Ltd., gave the Branch an interesting and instructive talk on "Modern Brewing."

The art of brewing is of ancient lineage, the Egyptians for instance, having learned it from the people of the Tigris and Euphrates about 5000B.C. The introduction of scientific measuring instruments came about 1760A.D., when the thermometer and hydrometer came into use through arguments about the assessment of excise duties. Since then chemistry has contributed largely to the art, notably from the biochemical side, as for example, Hansen's introduction of pure yeast cultures in the famous Carlsberg Breweries of Copenhagen.

Mr. Duncan discussed in some detail the materials used in New Zealand practice, mentioning in particular that the best barley comes from the lakes district of Central Otago. The barley is all grown in New Zealand, and a shortage at one stage led to the formation of a Barley Advisory Committee which set up a grading scheme. The grain is usually threshed from the stook, and a premium is paid for that threshed from the stook which is of better quality. The barley is stored for three months, and the district is noted to enable uniformity in making the steeps to be maintained. When used, it is screened and steeped in water for from 48 to 70 hours. Germination proceeds for from 8 to 12 days, and the material is then kiln dried and stored in bins for some weeks to cool and cure. The resulting malt is treated with water at 160deg. F. in the mashing machine for the production of wort, which is boiled in a copper vessel with hops for sterilisation and coagulation of albumins, etc. After straining and cooling, yeast is added and fermentation proceeds for some days.

Mr. Duncan stressed the fundamental importance of cleanliness, and described three methods of bottling. The discussion seemed to indicate that the subject was of very special interest to many members.

BRANCH NOTES.

At the June Meeting, the Chairman (Mr. L. W. Ruddle) made reference to the deaths of Mr. J. A. Pond and Mr. R. M. Laing. Although Mr. Laing's work lay in the field of Botany, he was, as a science master at Christchurch Boys' High School for over thirty years, responsible for the early teaching in chemistry of a number of Institute members. Members stood as a mark of respect to the memory of these men.

OTAGO BRANCH.

On June 11th, Professor Elizabeth Gregory gave a lecture on "New Biochemical Methods used in Human Nutrition," in which she embodied an account of research being carried out in the United States which she had observed last year. This work was on the nutritional status of various sections of the

community. In one town children were studied, in a small mill town a cross-section of the community was studied; while in a country district, work was carried out on whole families. The results so far obtained pointed to a widespread deficiency in essential food constituents.

Professor Gregory said that the usual methods were used with regard to energy providing foods and proteins. She then surveyed the methods being used or developed in the study of the mineral and the vitamin status.

Calcium, phosphorus, and vitamin D were intimately connected in calcification. By the long-established X-Ray method, besides showing the presence of rickets, it was possible to detect delayed calcification by comparing the X-Ray photographs with those of well nourished children, as the changes with age were definite and marked. The determination of the amount of phosphatase in the blood was a valuable method, values for rachitic blood being higher than for normal blood.

For iron, tests for haemoglobin had been used for many years. The question of anaemias was a complicated problem. Supply of iron in the food was, of course, only one factor; absorption of iron was an important factor. In the newer methods, photoelectric colorimeters were used to eliminate the personal factor in colour comparisons. Such an instrument had recently been acquired by the New Zealand Medical Research Council. There was no iodine problem in the parts of the United States where these studies were made, and iodine was not included in their tests.

Dealing with vitamins, the lecturer said that in few cases was there knowledge of the function definite enough to be used as a method of measurement. In some cases determination of the amount present in the blood was valuable, but in others it was not. Calcium and phosphorus were frequently within normal limits when rickets could be recognised clinically. There was, of course, the added difficulty of testing for the very small amounts present in the blood. In certain cases the excretion in the urine could be used as an indication of the state of nutrition; a low excretion in the urine indicating a deficiency in that vitamin.

The method most used for vitamin A depended on the fact that one symptom of deficiency was "night blindness." An "adaptometer" was used to determine how readily the subject's eyes adapted themselves to the dark after being exposed to a strong light. Some work had been done on the determination of vitamin A in blood by using the well known blue colour produced with antimony trichloride. This method presented great difficulties, and its value was not yet known.

Professor Gregory had seen only one method tried out for vitamin B1, which depended on the stimulation of the growth of yeast. This was applied to urine. Other methods being used for foods might later be adapted to urine. The well

known method for vitamin C, used on blood serum, was one of the few better established methods. For vitamin K, the coagulation time of the blood was determined and was used clinically.

On July 9th, the President, Dr. R. Gardner, gave a lecture entitled "Water Analysis." He said that he was going to deal mainly with the examination of water for household purposes. Dr. Gardner began by stressing the care needed in obtaining the sample, as a slight contamination might upset the results entirely. He thought it best to send out bottles when possible. The next consideration was to decide carefully on the scope of the analysis. This was often quite difficult and, of course, depended on the purpose for which the water was used. Finally, the interpretation of the results needed great care and experience. For most substances determined it was not possible to set rigid standards; it being usually necessary to interpret results in terms of the complete analysis. It was desirable to know something about other waters in the same district and about the source of the water.

Dr. Gardner proceeded to deal with the methods which he found most suitable for the different determinations involved. He preferred evaporation at 100 deg. for finding the total solids; but the solids were ignited to do a qualitative analysis. Charring indicated organic matter, while the smell given off was sometimes useful.

Determination of total nitrogen has never come into favour In using the Nessler method for ammonia, rubber corks were quite unsuitable, while bark corks could not be depended upon. It was best to use an all-glass apparatus, or to cover the corks with tinfoil. He had never known a water with a high ammonia content which did not show other signs of contamination. Decaying vegetable matter gave more albuminoid than free and saline ammonia.

Nitrate was very important since it came from the oxidation of ammonia. High nitrate showed contamination at some stage; the water needed watching as the natural means of purification might break down. Deep well waters might contain a lot of nitrate and be quite safe. Nitrate was reduced to ammonia by a zinc-copper couple and estimated by the Nessler method.

Nitrite was seldom found. It indicated recent contamination and generally a bad water. A high chloride content might indicate ancient pollution though, of course, it could arise in other ways.

Dealing with hardness, the lecturer said that the soap method was not very satisfactory. The Hehner methods generally gave satisfactory results. He next devoted some time to the bacteriological examination, which was well worth doing, although some laboratories did not include it. B. coli were probably not dangerous, but were evidence of sewerage con-

tamination. Other signs of contamination were generally also present. For brewing water, a count was done using malt and gelatine as the culture medicine; for dairy water, casein was used.

Dr. Gardner said the colour and odour of the water often gave clues, and a microscopic examination of any sediment might be illuminating. After dealing with the estimation of mineral constituents and dissolved oxygen and carbon dioxide, Dr. Gardner discussed in a very interesting way the conclusions to be drawn from some typical results.

PERSONAL.

It is with deep regret that we record that John Alfred Cole, R.N., has been reported missing, presumed killed.

Obituary

J. A. POND.

On the 8th June, 1941, occurred the death at his home in Remuera, of Mr. James Alexander Pond, one of New Zealand's oldest and most respected chemists. Mr. Pond, who was in his 96th year, had been actively engaged in the profession of chemistry since his arrival in this country in 1865, and at the time of his death was the oldest member of the New Zealand Royal Society, of which he had been president more than fifty years ago.

Commencing life as an errand boy in a large London chemical firm, Mr. Pond took a great interest in the work that the firm was doing, and with his acquired knowledge was able to take the position of research chemist to an American petroleum company.

Arriving in Auckland in the early 'sixties when the Maori War was in progress, Mr. Pond enlisted in the No. 4 Rifles. As he had already served in a volunteer unit in London, he obtained a non-commissioned rank at the outset and was soon senior sergeant of his corps. He continued as a member of his company for many years, but had by this time established his pharmaceutical business in Queen Street. His qualifications as a scientist eventually led to his appointment in 1882 as Government Analyst for Auckland, which position he held until his retirement in 1911.

Early in his Colonial career Mr. Pond joined the rush to Thames which had just been opened up as a goldfield. Soon after its proclamation he was working in the Golden Crown mine while it was yielding its share of gold from one of the richest patches in the district. This claim was adjacent to the Caledonian mine which later yielded £8,000,000 of bullion. It was during this period of his life that Mr. Pond made many friends, and throughout the whole mining district he was

affectionately known as "The Doctor" from his readiness to apply his medical knowledge to any fellow miner who was unlucky enough to have had an accident. One notable instance when Mr. Pond was called upon to stand alone against experts from southern towns was his exposure of the notorious Waitoa gold-fields scandal of the early 'eighties. An attempt was made to create a rush to certain farm lands in the Waitoa district on the strength of the finding of supposed alluvial wash. Mr. Pond visited the locality, made his own investigations and drew up a report which resulted in the exposure of the whole scheme.

Following his retirement from business, Mr. Pond set up a very well equipped private laboratory at his home where he worked actively until just prior to his death. Amongst the variety of problems that he was engaged on, was an attempt to discover a more satisfactory poison for ragwort. He also built a working model of a new process for the manufacture of superphosphate. In a portion of his miniature agricultural research station he had developed a large-leafed variety of clover that he had specially imported from Poland. Another plot demonstrated his success in the cultivation of tung oil trees and a remarkable variety of thin skinned white onions very suitable for domestic use.

His remarkably diversified interests in the field of science, together with his notable contributions to the early scientific development of the Dominion has made Mr. J. A. Pond one of the truly outstanding figures amongst the pioneer scientists of this country.

W. W. TELFORD.

By the death of Mr. W. W. Telford, works manager of the Hornby Works of Messrs Kempthorne Prosser & Co., the Canterbury Branch of the Institute has lost one of its foundation members. Mr. Telford was born in Stawell, Victoria, and qualified as an Associate of the Victoria School of Mines. He became Director of the Castlemaine School of Mines, and later was employed by Federal Explosives on acid manufacture. During the Great War he went to England and was associated with explosives production, and on his return came to New Zealand and joined Kempthorne, Prosser & Co. as chemist at their Westfield works. In 1922 he was transferred to Hornby and was appointed Works Manager a year later, a position which he held up to the time of his death.

Motions of sympathy with Mr. Telford's relatives were passed at the August meetings of the Council of the Institute and the Canterbury Branch.

The Chairman, Mr. L. W. Ruddle and the Hon. Secretary, Mr. F. H. Johnstone, represented the Branch at the funeral service.