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EDITORIAL

Nearly twenty years ago, Professor F. Soddy, after making distinguished contributions to pure chemistry, startled his scientific colleagues by venturing into the realm of social science, with the publication of "Wealth, Virtual Wealth, and Debt." Since that time similar incursions by scientific men have become common, in fact "Nature" shows in its editorials the extent to which such preoccupations are playing a common part in contemporary thinking. The claims of the progressives, who demand a large share in the government of mankind for people trained in the sciences, have not gone unchallenged, and members will no doubt have seen the joint statement on "The Place of Scientists in the Community," issued over the signatures of Sir Robert Pickard, Professor Alexander Findlay, and Sir Lawrence Bragg, representing the Joint Council of Professional Scientists, the Royal Institute of Chemistry, and the Institute of Physics respectively.

Soddy has now contributed another vigorous blast in his Presidential address to the Science Masters' Association, under the title "Science for Rulers," in the hope that he might be able to say something "that may help in overthrowing the soulless despotism of a counterfeit pecuniocracy that has usurped rule in the age that science has created, or to induce the world before it is too late to permit science to rebuild rather than destroy it." "Science for Rulers" says Soddy "does not yet seem to exist either as a properly thought out and arranged curriculum or even to have taken adequate concrete form in the minds of the few that realise the pressing need. The idea that a government has only to put its hand into the taxpayer's pocket to buy the thing that should be the basis of its own education, could only be entertained by a type entirely unsuitable for the duties of public office. Even the elements of ruler-craft in a scientific civilisation are not yet on sale." He presses home his attack on the traditional education of the governing classes in Britain with the remark, "it would be easier for a ruler who knew his science to pick up auxiliary aid of those learned in the past lore than vice versa—for a progressive and forward-looking type of mind to rule a pro-

gressive age than a stereotyped vestigial relic to hire the requisite help to keep him from making a fool of himself."

One does not need to be fanatically opposed to the classical type of education, to hold that there is much in Soddy's case. Sir J. J. Thomson, for instance, rebutted the claim that classically trained men made the best administrators by pointing out that the public schools strongly influenced the ablest boys to take classics, even if their proper bent lay elsewhere. In New Zealand we are not faced with the same problem as in Britain where, in the public schools at least, the defences of the classical tradition seem scarcely to have been breached. However, at a time when secondary education is being radically reformed we should be particularly interested in the kind of scientific work which is to be included in the new curricula.

In general the claims of biology, and so-called general science are being pressed by the new educators, as against the continued dominance of physics and chemistry. With regard to biology the case for its inclusion is very strong. Soddy, however, argues for physical science. "Perhaps the only idea at all original I have to offer in an attempt to evolve an educational curriculum more in keeping with a scientific age, is the somewhat paradoxical one that the physical sciences dealing with inanimate matter, rather than the biological sciences dealing with life, are the primary avenue of approach . . . The idea that biology has much to offer seems based on misconceptions . . . . much of the more scientific part of biology is really only physical chemistry in the living organism rather than *in vitro*."

The advocates of general science are accustomed to talk vaguely of "breaking down the barriers between the special sciences," and of "the unity of science." This unity, we believe, is merely one of a common method. Ingenious courses in general science have been devised but they fail to impress us, showing little sign of providing any genuine mental discipline. The recent statement of the Minister of Education shows that general science is to be one of the "core" subjects of the School Certificate Examination, together with English, social studies, elementary mathematics (which we understand is largely arithmetic), music, a hand craft, and physical education. This group of compulsory subjects seems large enough to limit severely the time available for other studies whose disciplinary value is more impressive. As a large majority of secondary school pupils will end their formal education at this level, we fear that they will go out from the schools without ever having been compelled to make a real mental effort. In particular, the undermining of the position of mathematics is deplorable. Experienced teachers have told us that they are now teaching some parts of mathematics in the fifth forms, which were treated in third forms twenty years ago.

For those who will continue to the fourth year and take the

University Entrance Examination the new proposals seem an improvement on the past. A student may either be accredited after completing a satisfactory course, or be examined in three subjects, a pass in two others at the School Certificate (third year) level also being required, one of the five subjects being English. This gives considerable scope for a reasonable amount of specialisation, and may be expected to produce, in general, first year University students better equipped for degree courses than a large proportion of students in the past. It is to be hoped that the University liaison officers will prove valuable in guiding pupils into courses which will give a sound basis for their later specialisation at the University Colleges.

THE PRESIDENT.

The new President, Dr. R. O. Page, is one of New Zealand's most prominent industrial chemists, and is widely known for his work in the field of leather chemistry. He is a son of Mr. S. Page, who was for many years lecturer in chemistry at Canterbury College. Graduating Master of Science in 1920, Dr. Page joined the staff of Woolston Tanneries, Ltd., as chemist in that year, and now occupies the position of works manager to the firm. He visited the United States in 1924 to study tanning methods, and in the past two decades has contributed notably to the theory of vegetable tannage. A thesis on this subject submitted to the New Zealand University in 1932 was rewarded with the degree of Doctor of Science, and Dr. Page's investigations have resulted in well over a dozen papers published in Industrial and Engineering Chemistry, the journal of the American Leather Chemists' Association, and the Journal of the International Society of Leather Trades Chemists. Dr. Page's interest in this difficult field is maintained despite increasing responsibilities, and his active mind is ever on the look-out for ways in which the notable advances in protein chemistry associated with the names of Astbury and others, can help with the complex problems of the leather chemist. He is well known in the Canterbury Branch as a keen advocate of lectures, in which advances in pure chemistry are made available to those whose work leads them to specialise in applied fields.

The President has been Chairman of the Canterbury Branch of the New Zealand Institute of Chemistry, President of the New Zealand Section of the Royal Institute of Chemistry, and President of the Canterbury Branch of the Royal Society of New Zealand. His standing among industrial chemists is shown by the appointment to the Council of the Department of Scientific and Industrial Research in 1937.

Dr. Page is a keen protagonist of the importance of our secondary industries, developed under scientific control. His view of the relation of secondary to primary industry is, however, a balanced one, and he sees the immediate future in terms of developing existing industries, the economic utilisation of waste products, and decentralisation with the help of cheap power.

REPORT OF COUNCIL MEETING, February 23rd, 1944.

The first meeting of Council for the year was held in Wellington on February 23rd. Dr. R. O. Page, President, presided and there were also present, Dr. J. C. Andrews, Vice-President, Mr. F. H. G. Johnstone, Christchurch delegate, Mr. P. White, Auckland Proxy; Dr. E. B. Davies, Wellington delegate; Dr. J. K. Dixon, Otago Proxy; Mr. S. H. Wilson, Canterbury Proxy by invitation.

Election of Trust Fund Trustees.—Dr. R. O. Page (President), Sir Theodore Rigg and Mr. G. A. Lawrence (Past Presidents) were appointed Trustees to the newly established Trust Fund.

Journal.—It was decided that copies of the Journal should be made available to non-members of the Institute upon payment of 2/- per single copy or 7/6 per annum, posted.

Reprints.—Council decided to present the author of a reprinted paper with 25 copies and to obtain 25 copies for its own purposes. Extra copies to be specially ordered.

Leave of Absence was granted Lt. Col. C. P. Worley, Auckland.

Association of Scientific Workers.—It was decided to support the above Association in taking up with the Commissioner of Taxes the matter of concessions to scientific workers in the form of allowances against assessable income for annual subscriptions to scientific Societies and any other such payments. Also to seek a reduction of Custom's duties on scientific apparatus, etc.

Medical Advertisements Board.—The attention of Council was drawn to two advertisements on which the Secretary was asked to obtain further information for forwarding to the Board.

Fatal Accident.—On February 9th, 1944, a young chemist, Mr. S. J. M. Hewitt, died in an the Wellington Hospital as the result of burns obtained in an accident with an alcohol-recovery still. The Institute is following proceedings and in the interests of all chemists will take what action is deemed advisable to prevent a recurrence of such an accident.

Conference.—Under present conditions the Council feels that it will be impossible to hold the Annual Conference this year.

Annual Meeting of Council in Person.—It was decided to hold the usual annual meeting of Council in person in August, 1944, and to invite suggestions from Branches as to locale.

Presidential Address.—The President expressed his willingness to give his address coincident with the above Council meeting.

F.N.Z.I.C. and A.N.Z.I.C:—Members are asked to use the above letters wherever possible and to take every opportunity of stressing their membership of the Institute, as for instance, where introductions are made for public or radio addresses.

SALARY SURVEY OF CHEMISTS AND LABORATORY ASSISTANTS.

In a recent number of the Journal of the Australian Institute of Chemistry (Vol. 10, 1943, No. 7) the results are given of a salary survey conducted by a committee of the Institute. From an analysis of the salaries paid in government departments, public utilities and certain large undertakings, the committee has suggested a scale of minimum salaries. The suggestions are made apparently for uniformity rather than to raise the general salary for chemists. This scale of salaries has been reproduced in Table I as of interest to New Zealand chemists. Since the wage level, except for unskilled labour, is higher in Australia, the Australian figures have been converted to a New Zealand standard in the last column, using the pre-war award rates of carpenters (representative of skilled labour) in Sydney and New Zealand as a basis of comparison. The ratio is 0.935.

The Council of the New Zealand Institute of Chemistry believes that it would be worthwhile to have a survey of N.Z. salaries carried out in a similar manner. The data obtained would provide a basis for any representations the Council might decide to make on salaries and would also reveal any anomalies in the positions of individual members. A suitable questionnaire should moreover elicit valuable data for assessing the actual and potential importance of the chemist in the various activities of the Dominion and in particular give an indication as to where New Zealand Industry is at present utilizing chemical control and in what direction such control could be further extended or introduced.

Accordingly a questionnaire has been drawn up for circulation. It is desired that the survey cover the widest possible field and is not to be confined to members of the Institute. Also it is specially asked that as far as possible answers for normal conditions should be given, any major change for better or worse induced by war conditions being excluded. It is hoped in this way to give the survey a more lasting value.

TABLE I.

Minimum salaries suggested by Committee of Australian Institute of Chemistry (based on analysis of salaries paid in Government Departments, public utilities and industrial undertakings). (2)

1. Grade	2. Description of Duties	3 Age	4 Years of Service in Grade	5 Suggested minimum salary assuming basic wage of £5/-/- per week (3)	6 Salaries reduced to N.Z. basis. (4)
A. Juniors		16		£117	£109
		17		143	134
		18		169	158
		19		208	194
		20		247	231
B. Adult Trainee Chemists and laboratory assistants		21	1	285	266
		22	2	310	290
		23	3	335	313
		24	4	355	332
		25	5	370	346
		26	6	385	360
		27	7	400	374
C. Pass University graduates (B.Sc.,N.Z.?) (1).	No previous experience		1st	370	346
			2nd	400	374
D. Qualified chemists (A.A.C.I. or A.I.C.) Grade III.	Solely engaged on routine and process control analysis		1st	410	383
			2nd	435	407
			3rd	460	430
Grade II.	Advanced analysis plant control or research work under supervision.		1st	495	463
			2nd	520	486
			3rd	545	510
Grade I.	Responsible work not under direct supervision.		1st	573	536
			2nd	600	561
			3rd	625	585

NOTE:

(1) Honours graduates to start at 2nd step, £400 Aust.

(2) Female staff to be paid 80% of corresponding rate for male employees.

(3) Salaries suggested are for normal conditions. Shortage of chemists at present has tended to raise salaries.

(4) See Text.

INSTITUTE ESSAY PRIZE.

Members are reminded that the Institute Prize for the best essay on a subject concerned with Industrial Chemistry is again offered this year, and entries must be received by the General Secretary not later than June 30th.

BRANCH NOTES

AUCKLAND BRANCH

THE REFINING OF MINERAL OILS.

Mr. F. S. Stevens, 5th August, 1943
Manager, Dominion Oil Refinery.

Mr. Stevens began by outlining the occurrence of petroleum in nature and the separation by distillation of the main products derived from it. In connection with gasoline he gave further details in regard to refining, the main operations being distillation to the required boiling range and the removal of objectionable compounds. Further quantities of gasoline are obtained by cracking at elevated temperatures and pressures of various high boiling fractions. High octane gasolines are obtained by reforming and hydroforming processes in which butane and butene, etc., are polymerised to iso-octane. Typical laboratory tests such as distillation range and octane number were described.

The main refining process performed on the lighting kerosene fraction is one of selective absorption of the aromatics by liquid sulphur dioxide in the Edeleanu process to produce a paraffinic hydrocarbon which does not burn with a smoky flame. Other products such as diesel fuel and bitumen were dealt with only briefly.

Mr. Stevens then spoke about lubricating oils. The light oils are separated by distillation, often under reduced pressure and with the aid of steam to reduce the temperature. The residues also contain heavy lubricants when certain crudes are used. The oils are then treated by one or more of the following processes—dewaxing, solvent refining, which is the same in principle as the Edeleanu process but using different solvents such as furfural, cresols, propane, etc., treating with sulphuric acid, and decolourising by filtering through activated earths. Mr. Stevens also described various laboratory tests, including viscosity, viscosity index, and flash point.

Finally Mr. Stevens described the methods used in the re-refining of used lubricating oils. The contaminants are water, heavy gasoline fractions, carbon, dust, and oxidation products of the oil and fuel. Edge filtration as used in the Streamline filters removes the solid impurities, while water and diluent may be removed by heating. The oxidation products are removed by treating with sulphuric acid, followed by heating with activated earths, such as bentonite, and filtering. The refined oils are then blended as required for use. Mr. Stevens performed a striking demonstration of the above process on a used oil. At the conclusion of the lecture Mr. Stevens answered many questions, mainly in connection with the re-refining of oils.

THE MANUFACTURE OF PLYWOOD.

Mr. E. D. Pain, N.Z. Plywoods, Ltd. 9th September, 1943.

Mr. Pain began his interesting talk with a description of plywood and veneers in their many forms. The usual form is in three or more plies, often of equal thickness, quite frequently having an expensive or decorative wood on one face with a less expensive wood for the rest of the board. Other forms are "laminboard," which has two veneers on each side of a board which is itself made up of a large number of narrow strips of wood glued together, and "blockboard," which is somewhat similar but with the centre of shorter pieces of wood.

Mr. Pain then showed photographs of the various machines used in the industry. One of the oldest is the veneer saw, but it is very wasteful of wood. The same type of cut is produced by slicing machines operating on the same principle as the carpenter's plane. Both these methods produce decorative veneers. The most common machine is the veneer lathe used for 90% of the work to-day. The logs are conditioned, before cutting, by slowly heating in a vat, using dry steam or hot water, although it is common practice in some factories not to cook the logs at all before turning them into veneer. The veneers have next to be graded according to their moisture content, after which they are carefully dried. Tangential shrinkage may be 8 to 15%, the radial 4 to 5%, while the longitudinal shrinkage is only about ½%; consequently patches of cross or twisted grain can easily cause the sheet of veneer to crack.

Adhesion is partly specific and partly mechanical. It is well known that two perfectly smooth surfaces, if in intimate contact, need no glue to hold them together. Wood is usually polar and adheres with aqueous adhesives, which also are polar, water resistant casein glues being very popular, while vegetable protein glues are also very extensively used. If

wood is heated under certain not very well defined conditions it may become non polar and great difficulty is found in satisfactory glueing with aqueous adhesives. Phenol formaldehyde and other synthetic resin adhesives are rapidly being developed. The latest phenolics are water- and weather-proof, and are used in aeroplane and small ship construction. These resins have to be heated to complete the chemical reaction, but urea formaldehyde resins set at ordinary temperatures when catalysed with weak acids or various salts, such as, for example, zinc chloride. The glues are applied to the veneers by means of rollers; the sheets are then pressed in a press which may or may not be heated, and after removal are trimmed to size and sanded.

During his talk Mr. Pain showed numerous exhibits of veneers and plywoods, some of them to show what happens when skill is not used in the making of the plywood.

"A VISIT TO THE UNITED STATES UNDER WAR CONDITIONS."

Dr. J. C. Andrews. 28th October, 1943.

Dr. J. C. Andrews, who has recently returned from a visit to the United States on behalf of the New Zealand Government to study the dehydration of foodstuffs, gave a very interesting account of some of his travels. He said a lot of the travelling was done by plane as trains and buses gave poor service. The cost of living was high and accommodation and certain foods were scarce. One place visited was the Tennessee Valley, where, by building about ten dams, the river level was raised and controlled. This allowed ships to go further up the river and the hydro-electric power developed gave birth to large chemical industries. He also paid visits to one of the Kaiser shipyards and to an aircraft plant.

Speaking about the meat packing industry as he saw it in the Chicago and Nebraska areas, he considered that, large though it was, it was not extremely efficient, and, compared with it, New Zealand packers were not lagging in technical development. Considerable experimentation was being made in substitutes for tin plate food containers, and Dr. Andrews exhibited some samples of such wrappings made of chlorinated rubber, cellophane, etc.

In the United States vegetable growing is done on a very large scale, and often the owner operated a canning or dehydrating plant to dispose of his produce. Compared with New Zealand, lower yields per acre were obtained in spite of universal irrigation. An increasing amount of guayule is grown in California and Texas from which rubber is obtained,

and they hope eventually to produce it at a price to compete on an open market.

Speaking about the plastics industry, Dr. Andrews said that it is very complicated, and that most people considered that it would never replace timber and steel in the building of houses and motor-cars. He did not hold out very bright hopes of it being established in New Zealand.

Dr. Andrews also spoke about several other subjects, including the Press, theatre, the Negro problem, and the licensing laws.

The officers of the Auckland Branch for the forthcoming year are as follows:—

Chairman, K. M. Griffin.
Hon.Sec.-Treasurer: B. E. Jackson.
Committee: S. G. Brooker, F. H. V. Fielder, E. D. Pain, R. Stansfield.
Delegate to Council: K. M. Griffin.
Hon. Auditor: A. J. Parker.

WELLINGTON BRANCH

The October meeting was the Annual General Meeting and the officers elected were as follows:—

Chairman, Dr. E. B. Davies; Sec. Treas., Mrs. P. W. Broad; Committee, Messrs. D. H. Freeman, S. J. Lambourne, K. S. Birrell, and L. Wilkinson; Representative on Council, Dr. E. B. Davies; Hon. Auditor, Mr. G. A. Lawrence.

When the business was concluded a number of interesting and ingenious pieces of apparatus were exhibited by different members. Most of these were home-made. From the Soil Survey Mr. Birrell demonstrated the use of fluorescent indicators viz, 2:6 dihydroxy phthalonitrile and 2:6 dihydroxy phthalimide in turbid and coloured solutions and the adsorption indicator dichloro fluorescein using ultra-violet light.

Apparatus used for electrodialysis of soils to extract exchangeable anions and cations was shown by Mr. Gemmell, and its applications summarised, for instance, soil genetics investigations.

From the Dominion Laboratory Mr. S. H. Wilson showed an improvised fluorometer for the determination of Vitamin B1 in foods. Ultra-violet light from a 120 watt mercury lamp was focussed on a test-tube by means of a large flask filled with water and the fluorescent light from the solution of thiochrome in the tube passed through a solution of sodium nitrite on to a photo-electric cell.

A display of sintered glassware by Mr. J. O. Elphick, included pieces made in Germany, England, and by Mr. W. Barr. A brief description of the process of manufacture was given and some special uses as gas non-return valves and safety valves were explained.

Mr. R. L. Andrew demonstrated a simple technique for estimating the amount of alcohol in blood and urine, based on a modification of Widmark's method. Alcohol vapour from a weighed sample contained in a small weighing tube is oxidised by acid potassium dichromate in a 4oz. glass stoppered sample bottle, and at the end of the reaction the excess dichromate is titrated with decinormal sodium thiosulphate. A blank is run at the same time. The accurate estimation of alcohol in blood and urine is of great importance as evidence in medical jurisprudence cases, e.g. 50-100 mgms. alcohol per 100 gms. sample indicates a man has been drinking, 200 mgms. the man is moderately drunk, 300 mgms. very drunk, and 350-400 mgms. indicates almost a comatose state.

From the Agriculture Laboratory Mr. E. P. White showed a microburette with screw control, eliminating taps and giving accurate control, and also a Freidrich apparatus of a modified design for the determination of methoxy, ethoxy, and methylimino groups. From the same laboratory, Mr. R. N. Seelye showed a micro-combustion furnace. This is an electrically-heated micro-combustion furnace giving accurate temperature control and combining the advantages of several existing models. Mr. F. D. Collins exhibited a micropycnometer using 0.17 ml. and accurate to three parts per thousand using an analytical balance.

CANTERBURY BRANCH.

At the Annual General Meeting of the Canterbury Branch, the following officers were elected for 1944:—

Chairman: Mr W. L. M. Dearsley.

Hon. Secretary-Treasurer: Mr. F. H. G. Johnstone.

Committee: Drs. M. M. Burns, R. J. McIlroy, R. O. Page, Mr. C. G. W. Mason.

Delegate to Counril: Mr. F. H. G. Johnstone.

Hon. Auditor: Mr. G. D. Law.

The Chairman, Mr. W. L. M. Dearsley, was educated at Christ's College, Clifton College, and Cambridge University. He took the Natural Science Tripos, studying chemistry, zoology, and botany, and in a fourth year, physics. On com-

pleting the M.A. degree he spent a year in Scandinavia and Germany, mainly at the Garungs Institute in Berlin, studying fermentation processes. He joined the Dominion Compressed Yeast Co. as chief chemist, a position which he still holds.

Following the Annual General Meeting an open discussion was held. The chairman, Dr. Burns, who was also Delegate to Council, reported on some important matters dealt with by Council during the year. He explained in detail the proposals which have been adopted for improving the finances of the Institute.

Dr. R. O. Page raised the question of the custom which has grown up of re-electing the President, so that he holds office for two years. The meeting was strongly of the opinion that the one year term is sufficient, and on the motion of Dr. Parton, seconded by Dr. Page, the committee were recommended to raise the matter with Council. It was also felt that while the practice of electing Presidents from the Branches in rotation has much to recommend it, consideration must be given to the fact that more than one-third of the total membership is in the Wellington Branch, and the tendency to centralisation is accumulating a high proportion of the Institute's prominent members there.

Dr. Page also called the attention of members to the lessened interest shown to-day in the Royal Society in Canterbury, and urged chemists to support it. Mr. Packer explained the attitude of chemists to the Royal Society at the time the Institute was founded. He felt that the Royal Society cannot enter professional matters affecting chemists, who must face responsibilities to both bodies. Mr. L. P. Symes said that falling attendances at Royal Society meetings has been a problem for many years, and suggested increased specialisation as the cause.

Dr. Burns expressed the opinion that the Institute is not obtaining its money's worth from the present form of Journal, which cost about half the income. He thought it could be developed as a medium for establishing the position of the Institute as a body capable of expressing sound views on special topics. He suggested publication of papers, such as the Industrial Chemical Essay, and important papers presented at Branch meetings, in the form of pamphlets which could be distributed to interested organisations.

Dr. Parton agreed with the chairman's views about the cost of the Journal, though the net cost is lower than Dr. Burns had stated. Dr. Page and Mr. Packer defended the present form of Journal. The former said that special addresses might be published in pamphlet form, as is done by the British Institute.

As a means of bringing the Institute before the public. Miss M. P. Bartrum suggested radio talks by members. It was pointed out that the public already submitted to such talks by certain members. Dr. Burns said that the announcer might be asked to refer to the speaker's position in the Institute in such cases.

[This suggestion has not been followed up if a recent broadcast to farmers by Dr. Burns is to be taken as an example.—Ed.]

OTAGO BRANCH.

On August 11th, Mr C. Hassall addressed the Otago Branch on the subject, "Synthetic Rubbers." He pointed out that synthetic rubber was the one solution to the present problem of natural rubber shortages. The lecturer gave a survey of the elucidation of the structure of rubber, from the early degradative experiments to recent work of Staudinger and Mark and Mayer using X-rays to investigate the orientation of the rubber chain molecules. It was shown how research was stimulated at times by the erratic price of the raw product. The first industrial product appeared in 1914 in Germany, a polymer of 2, 3 dimethyl butadiene known as Methyl H, or in a slightly different form, Methyl W.

Mr. Hassall then classified the synthetic rubbers that have been and are being used industrially. The most important products were polymers of butadiene and 2-chlorobutadiene. The former used alone gave the Russian product SKB and the German Buna 85, and Buna 115, while co-polymerized with other materials gave among others Buna S, Buna N, and Perbunan. 2-chlorobutadiene gave the important U.S.A. products Neoprene and Duprene, and the Russian Sovprene. After dealing with a number of less important rubbers, including Thiokol, which was prepared at the lecture, Mr. Hassall discussed the working properties of synthetic rubbers, and the application of the vulcanising process to them. The advantages and disadvantages of each important synthetic were listed.

In conclusion the lecturer pointed out the spectacular nature of the advances in recent years in both the quality and the quantity of synthetic rubber produced. After the lecture Mr. Hassell answered questions and showed a number of slides to the meeting.

The speakers at the "Current Research" meeting of the Otago Branch on September 8th were Mr. C. H. Hassall, Miss M. Lindsay, and Mr. M. J. McDowell. Introducing the speak-

ers, Professor F. G. Soper briefly reviewed the aspects of the chemistry of the chloroamines which were of particular interest at the moment, in connection with the work of Miss Lindsay and Mr. McDowell.

Mr. C. Hassall gave a short account of the chemistry and physiology of ergot from the historical aspect. He then described some of the methods available for the separation of individual alkaloids, but said that no method was available for the complete separation of all the alkaloids. The following method was therefore developed:—

After extraction of the fat with petrol ether, the alkaloids were separated into a water soluble and a water insoluble portion by shaking an ethereal solution with an aqueous solution at pH 5.5. Ergometrine appeared in the water soluble portion.

The water insoluble portion was further separated into an alcohol insoluble portion from which were obtained by fractional crystallization from a variety of solvents, ergotaminine, ergosinine, and ergotamine; and an alcohol insoluble portion from which ergotoxin could be extracted by ethyl acetate, leaving ergotamine, ergosinine, and ergotaminine which were efficiently separated by chromatographic absorption.

The chief difficulties encountered were the instability and interconvertibility of the alkaloids. They also readily form complexes with solvents and each other, and do not give sharp melting points but indefinite decomposition points. They do not readily crystallize and are easily adsorbed on inert material.

It was of particular interest that a sample of New Zealand ergot contained considerable ergotamine, but not ergometrine. The only other source of ergotamine is Hungarian ergot.

Miss M. Lindsay discussed the nature of methylene chloroamine, which is formed by the interaction of an aqueus solution of chloroamine with formaldehyde, thus

$$NH_2Cl + CH_2O = (CH_2NCl)x + H_2O$$

where x was variously stated to be 2 and 3 according to the method of preparation. Molecular weight determination in benzene and nitrobenzene showed the substance to be always trimeric, and samples prepared by different methods were shown by crystallographic methods to be identical.

Measurement of the freezing point of an aqueous solution of equimolar quantities of chloroamine and formaldehyde over a period of several hours showed that the monomer was first formed rapidly and then slowly polymerized to the trimer. The method was also used to show that acetone did not condense with chloroamine in aqueous solution.

Mr. M. J. McDowell discussed the hydrolysis of the peptide link, thus, $RCO.NHR_1 + NaOCl = RCO.NClR_1 + NaOH$
$= RCOONa + R_1NHCl$

This reaction occurred much more rapidly than that involving hydrolysis by alkali alone. Thus the sodium salt of benzoyl glycine was hydrolysed by alkaline hypochlorite into sodium benzoate and N-chlorglycine, which latter was oxidized by further hypochlorite. The percentage hydrolysis was measured by conductivity titration, by extraction of the benzoic acid, and by following the rate of disappearance of sodium hydroxide (equal to the rate of formation of benzoic acid). The following compounds reacted similarly:—Acetyl-glycine, succinanilic acid, phthalanilide (but not phthanalic acid), veronal, acetanilide, and the nitroacetanilides. Other workers had found the reaction to occur with N-chlorsaccharin, N-dichloro dimethyl urea, and N-chlorphthalimide. N-dichlorveronal and N-dichlorphthalanilide were new substances.

The reaction was discussed in the light of the electronic theory of organic reactions. It was affected by the lengths and energies of the bonds concerned, which in turn depended on the degree of resonance in the reacting molecules. The possibility of hydrogen bond formation affecting the reaction was also mentioned.

The reaction indicated the advantage of bisulphite over alkali as a dechlorinator for chlorinated wool.

COLOMIMETRIC ANALYSIS.

T. A. Thomson.

The lecturer said that two factors permitting the recent great extension of colorimetric methods were:

(1) The development of instruments permitting sufficient accuracy to bring colorimetry in line with gravi-metric and volu-metric methods.

(2) The systematic examination of organic reagents initiated by Feigl.

Several types of reagent giving inner complex salts were described and certain frequent advantages of such reagents, e.g. strong colour and selective action, were demonstrated.

Various methods of improving old and developing new reagents were mentioned, especially those wherein certain organic groups were added.

After a brief description of some colour measuring instruments, comparative figures were quoted to show the accuracy obtained and to make comparisons with results obtained with the spectrograph and polarograph.

The lecturer then demonstrated two micro colorimetric methods.

1. The novel method of Yagoda. This uses spot methods in which the diameter of the spot is maintained constant by means of an impermeable boundary, generally paraffin wax.

Yagoda's method has a range of action of 0.01 to 2 gamma using volumes of 0.05 to 10 ml., with an accuracy of 2 to 8%. An advantage is that reagents giving insoluble reaction products are often employed.

2. The coloroscopic method which had permitted the lecturer to make semi quantitive tests with quantities as small as 0.002.

Mr. Thomson indicated possible developments of this technique.

In closing, the great range of colorimetric methods with respect to reaction type and quantities handled, and also the possibilities of future progress were stressed.

At the Annual General Meeting on 10th November, 1943, the following officers were elected for the year 1944:—

Chairman: Dr. S. N. Slater.

Hon. Sec. and Treas.: Mr. T. H. Kennedy.

Committee: Messrs H. G. Woolman, L. H. James, R. V. Peryman, Professor F. G. Soper.

Hon. Auditor: Mr. T. A. Thomson.

After the annual meeting the usual "Odds and Ends" meeting was held. The speakers were Mr. M. B. V. King, who demonstrated some useful types of beaker and similar apparatus; Mr. Ongley, who demonstrated some points in filter paper technique, a quantitative microdropper, and a micro burette; Mr. Roberts, who showed an improvement on the usual method of measuring the equivalent weight of magnesium as a class exercise; Mr. Hassall, who demonstrated a micro sublimation apparatus; Mr. Fastier, who showed a drop counter and scales with an adjustable zero on the dial; and Dr. Muriel Bell, who demonstrated some posters used for nutrition educational purposes. Dr. Bell, Mr. Fastier, and Mr. Kennedy showed the members the equipment of their respective research departments in the Medical School.