

JOURNAL AND PROCEEDINGS OF THE ROYAL INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND

PART II

1948

REPORT OF THE COUNCIL: 1947

To be submitted at the Seventieth Annual General Meeting of the Institute
to be held on Friday, 16 April, 1948

The year 1947 has been a period of extremes. An intensely cold winter followed by floods gave place to a summer of record heat and accompanying drought. The national disaster of the fuel crisis which disrupted plans for industrial recovery was followed by national rejoicing on the marriage of H.R.H. the Princess Elizabeth to Lieut. Philip Mountbatten, an event that called forth messages of congratulation and good wishes from all over the world, in which the Institute was proud to join. The growing menace of economic disintegration, threatening the very basis of our standards and mode of living, was temporarily forgotten in welcoming the numerous visitors from overseas who came to join with us in celebrating the Centenary of the Chemical Society and in the meetings of the International Union and the International Congress of Pure and Applied Chemistry. At the Centenary celebrations the Institute was officially represented by its President, who subsequently entertained the Officers of the Chemical Society and the principal representatives of sister institutions in the British Commonwealth, at a small dinner party at Apothecaries Hall. About 350 of the Officers and Overseas Members of the International Congress were entertained by a like number of members of the Institute at a reception at Grosvenor House and this event provided a much appreciated opportunity of establishing or renewing personal contacts between members of the chemical community in all parts of the world.

Following a change in the By-laws, the Annual General Meeting of the Institute was held for the first time in the month of April. There were no changes in the Officers, but a number of alterations in the membership of the Council. A motion to increase the sum that might be appropriated annually towards the maintenance of a staff superannuation and pensions scheme was carried, but a proposal to merge the Associateship grade of membership in that of the Fellowship was heavily defeated. At the Anniversary Luncheon which preceded this meeting we were fortunate in having as principal guest Sir Henry Tizard, who, in proposing the toast of the Institute, referred to the valuable help that the Institute and similar professional bodies could give to the Government in promoting the applications of science to national defence and industrial production.

The subsequent development of the economic crisis has emphasised the importance of the role that professional institutions, dedicated under their Charters to safeguarding the interests of the community, could and should play in these difficult times. It is a matter for regret, therefore, that on questions where the advice and help of such bodies would be of special value, reliance is sometimes placed on consultations only with employers' or trade union organisations, which by their constitutions are primarily concerned with

advancing the material interests of their members. The fact that professional institutions demand of their members high standards of qualification and ethical conduct without exercising any restraint on the practice of the profession by non-members (except where such restraints have been imposed by Statute for the protection of the public) places on these bodies heavy responsibilities which greatly outweigh any corresponding privileges that they or their members may enjoy. It is hoped that a better understanding of the nature and purpose of the Institute and similar bodies will result in a wider recognition of their true position among our democratic institutions and of the increasingly important contributions that they should make towards the restoration and development of the prosperity of this country and the British Commonwealth.

The establishment in recent years of closer and still more cordial relations with fellow chemists in the Dominions is being carried a stage further by the visit Professor Findlay is paying to the newly-constituted Dominions of India and Pakistan. His tour of important centres of scientific activity in these countries has already stimulated interest in the further development of education for and the organisation of the profession of chemistry and there is no doubt that the results of his mission will be of great value not only to the Institute, but also to the scientific community at large.

In the field of domestic activity outstanding events have included the holding of a colloquium in Dublin, jointly with the Irish Chemical Association, on "The Utilisation of Agricultural Products and of Seaweed" and a symposium at St. Andrews on "Coal, Petroleum and their Newer Derivatives." These meetings come within the category of the scientific courses and conferences that the Institute has undertaken to sponsor. Acceptance of an invitation from the Birmingham and Midlands Section to hold the Annual General Meeting of the Institute in Birmingham in 1948 marks a departure from long-established tradition. A decision to invite recipients of the Meldola Medal to lecture before the Institute is also an innovation and the first of these lectures was delivered by Dr. A. W. Johnson in October. In consultation with the Institute of Metals and the Society of Chemical Industry it was agreed to resume the making of awards from the Sir George Beilby Memorial Fund for 1947.

The absence of any printed Register of Fellows and Associates since the abridged edition was issued in 1940 and the last complete edition in 1938 has been greatly deplored and the Council is happy, therefore, to report that, following an allocation of paper for this specific purpose, a request for the relevant particulars was sent in the latter part of 1947 to all corporate members of the Institute and a new complete edition of the Register will be issued as soon as possible. Particulars of remuneration in relation to age and class of employment were also obtained from members at the same time with a view to publishing early in 1948 up-to-date remuneration statistics on lines last adopted in 1942.

The publication of the new Register will be of special value in assessing the extent to which particular areas are adequately served by Local Sections—a point raised at recent Conferences of Hon. Secretaries—and in discovering how far membership of the Institute includes the appropriately qualified chemists in the country. In this connection, a new committee, the Membership Committee, was set up during the year and has begun to survey means whereby a larger proportion of such chemists might be attracted to membership.

The expansion of Institute activities since the end of the war has greatly increased the amount of work to be dealt with by the staff. The Institute has been fortunate, however, in securing as from 1 March, 1947, the services of Mr. L. W. Raymond, I.S.O., as Deputy Executive Officer. The appointment of additional junior staff has been approved and it is hoped that this may soon become effective.

Details of the above and other developments and activities during the year are reported below under the appropriate headings.

MEMBERSHIP AND STUDENTSHIP

The Council has learned with regret of the death during the year (or earlier) of the following Fellows, Associates and Registered Students:—

Fellows

Hector Robert Adam	Christopher Lambourne
Frederick Shelburne Bayley	William McDonnell Mackey
Louis Pierre Bosman	Frederick Alfred Mason
George Thomas Byrne	Sura Rajagopal Naidu, M.B.E.
Henry Thornton Calvert, M.B.E.	George Newbery
Richard John Carter	James Arthur Newcombe
Walter Charles Carter	Percy Parrish
Edgar Marsh Chapman	Edgar Philip Perman
Percy Broadbent Crossley	John William Pooley
The Rev. Percy Marr Davies	John Braithwaite Robertson
Andrew James Dixon	Bernard Paul Rothwell
John Don	Walter Raymond Schoeller
John Garwood Everett	Alexander Scott, F.R.S.
John Masson Gulland, F.R.S.	Frank Sheldon
David Hooper	Frederick Farey Shelley
Sir Frederick Gowland Hopkins, O.M., F.R.S.	Albert Sherlock
Arthur Percy Hoskins	James Smith
Bertram Ernest Houlder	Montagu White Stevens
Arthur Jaques, O.B.E.	Ralph Charles Storey
John Baker Cunningham Kershaw	Paul Hannay Symons
	Roland Francis Young

Associates

Henry Adams	Barradale Whiddon Melhuish
Alfred Lees Aspland	Kohitish Chandra Mukherji
Frank Bourne	William Edwin Newell
Leslie Norman Brown	Launcelot Nickels
Subikas Das Gupta	Leslie George Brett Parsons
James William Donaldson	David McLaren Paul
Arthur Handel Eastwood	Leoneore Pearson (Mrs.)
Edgar Heaton	Arthur Chambers Prigge
Donald Helmsley Hewitt	George Thomas Purves
William Hill	Manickahm Partha Sarathy
Ronald Humphries	Nagendra Nath Sen-Gupta
Herbert Inman	Herbert Procter Smith
Victor Lefebure, O.B.E.	John Affleck Stevenson, M.C.
Herbert Marsden	Francis Digby Toyne
David McCreathe	Greatrex Johnson Woods

Registered Students

Frank Roy Devonald	Richard Henry Riddell
Harold Thomas Naughtin	Colin Frederick Lewis Sterck

Changes in membership and studentship during the year are recorded below, with the corresponding figures for 1946 for comparison.

	Twelve months ended 31 December					
				1946	1947	
Additions and promotions:						
New Fellows				26	38	
Fellows re-elected				4	1	
Associates elected to Fellowship				188	178	
New Associates				417	399	
Associates re-elected				23	16	
Students elected to Associateship				131	138	
New Students				438	489	
Students re-admitted				4	6	
Deaths:						
Fellows				41	43	
Associates				15	31	
Students				3	4	
Resignations:						
Fellows				3	4	
Associates				22	28	
Students				68	57	
Removals:						
Fellows				1	1	
Associates				19	21	
Students				163	163	

The numbers of Fellows, Associates and Students on the Register of the Institute at 31 December, 1947, and at the same date in 1946 were as follows:—

	At 31 December		
	1946	1947	Increase
Fellows	3,421	3,590	169
Associates	6,720	7,015	295
	<hr/> <u>10,141</u>	<hr/> <u>10,605</u>	<hr/> <u>464</u>
Students	<hr/> <u>1,488</u>	<hr/> <u>1,621</u>	<hr/> <u>133</u>

The net increase in the number of corporate members (Fellows and Associates) of 464 in 1947 may be compared with 500 in 1946, 459 in 1945, 560 in 1944, 462 in 1943. During the earlier part of the War the rate of increase was substantially lower; 192 in 1942, 264 in 1941, 242 in 1940, and 369 in 1939. The rate of growth of membership attained in 1943 has thus been substantially maintained since then.

The scope of the Joint Subscription Arrangements made by the Chemical Council has been further widened during the year by the inclusion of the Society of Public Analysts and Other Analytical Chemists. All categories of joint subscription necessarily cover the Chemical Society and the Society of Chemical Industry and may cover also the Institute and/or either the Faraday Society or the Society of Public Analysts and Other Analytical Chemists. The following figures indicate the number of persons who were joint subscribers to at least the three chartered bodies at 31 December in the specified years:—2,382 in 1944, 2,719 in 1945, 3,086 in 1946, 3,249 in 1947.

In the absence of exact information very diverse estimates have been made of the number of chemists in Britain who, though qualified for admission to the Associateship or the Fellowship, are not at present corporate members of the Institute. There is no doubt, however, that there must be several thousand of them and, in view of the growing need for the Institute to be able to speak and act for the profession of chemistry as a whole, the Council decided in June to set up a Membership Committee to consider means of attracting to membership of the Institute a larger proportion of the qualified chemists in the country (*JOURNAL AND PROCEEDINGS*, 1947, IV, 159). This decision was not taken in order to initiate a mere propaganda campaign for increased membership, but to discover how the benefits and privileges of membership might be extended and improved, and knowledge of them more widely disseminated, so as to attract the active support of a still greater proportion of British chemists, not only for the Institute itself but also for the societies associated with it on the Chemical Council. Meetings of the new Committee held before the end of the year were mainly of an exploratory nature but a number of promising proposals are being carefully studied.

THE COUNCIL AND COMMITTEES AND REPRESENTATIVES OF THE INSTITUTE ON OTHER BODIES

At the Annual General Meeting, 1947, all the Officers were re-elected for a further year and there have been no changes in the membership of the Council since that date.

In November Professor Alexander Findlay, Vice-President and immediate past President, left England on a mission on behalf of the Institute to India and Pakistan (*see p. 112*) and other members of Council were appointed to act for him in various capacities, especially as chairmen of certain committees indicated below.

During the year 10 meetings of the Council were held. Committees of the Council and of the Institute that have been active during the period are recorded below, with the names of their Chairmen (since the Annual General Meeting, 1947) and the numbers of meetings held.

Committees of Council

Finance and House Committee	<i>The Treasurer</i>	9
Nominations, Examinations and Institutions Committee	<i>The President</i> , with Prof. H. V. A. Briscoe, <i>Vice-President</i> , as Vice-Chairman.	10
Publications and Library Committee	Mr. A. L. Bacharach, <i>Vice-President</i> .	8
Special Purposes Committee	<i>The President</i>	1

Standing Committees of the Institute

Appointments and Economic Status Committee ..	Prof. A. Findlay, <i>Vice-President</i> : (Acting Chairman, Dr. F. Roffey)	3
Benevolent Fund Committee	<i>The Treasurer</i>	9

Ad hoc Committees of the Institute

Committee on Revision of Charter and By-Laws	Prof A Findlay, Vice-President (Acting Chairman, <i>The President</i>)	2
National Certificates Special Committee	Prof A Findlay, Vice-President	1
Membership Committee	Prof F Challenger	2

The representatives of the Institute on Joint Committees that have been active during the year were as follows —

The Chemical Council Mr R C Chirnside, Professor A Findlay, Mr G Roche Lynch and The Treasurer

The Joint Council of Professional Scientists Mr M B Donald, Professor A Findlay, Mr G Roche Lynch, Sir Robert Pickard, Dr J L Simonsen and the Secretary

The Joint Library Committee Mr A L Bacharach, Professor H V A Briscoe, Mr H W Cremer and Professor A Findlay

The Joint Committee of the Institute and the Society of Public Analysts and Other Analytical Chemists (combining the functions of two previously existing joint committees on Public Health matters and Economic matters) The President, Dr J F J Dippy, Professor A Findlay, Mr E T Osborne Mr R W Sutton, Mr E J Vaughan and the Registrar

Joint Committees on National Certificates

- (a) with the Ministry of Education (England and Wales) Professor H V A Briscoe, Mr R C Chirnside, Professor A Findlay, Mr J A Oriel and Mr A J Prince
- (b) with the Scottish Education Department Professor J W Cook, Mr G E Dodds and Dr R D Strathdee

The representatives of the Institute on other bodies have been as follows

The Parliamentary and Scientific Committee Mr A L Bacharach, Professor A Findlay (a Vice-President of the Committee) and Dr H J T Ellingham

The Poisons Board (Pharmacy and Poisons Act, 1933) *Statutory Appointment* Mr G Roche Lynch

The Advisory Committee appointed under the Therapeutic Substances Act, 1925 Professor D H Hey

The Headmasters' Employment Committee of the Ministry of Labour Mr R L Collett

The British Management Council Professor A Findlay

The National Committee for Chemistry, of the Royal Society Professor J W Cook
British National Committee of the World Power Conference Dr J G King (in succession to Dr H G Colman)

The Chemical Divisional Council of the British Standards Institution Mr E T Osborne (in succession to Professor H V A Briscoe)

The British Chemical Ware Manufacturers' Committee, dealing with Key Industries (Scientific Equipment and Materials) Dr A H Cook

The Oils, Fats and Waxes Advisory Committee of the City and Guilds of London Institute Mr W H Simmons

The Advisory Committee of the City and Guilds of London Institute on the Dyeing of Textiles Dr H H Hodgson

Joint Committee on the Standardisation of Methods of Chemical Analysis of Potable Waters Mr W Gordon Carey

The Chemical Trades Advisory Committee and the Chemical Trades Examination Board of the Union of Lancashire and Cheshire Institutes Mr R L Collett

The Committee on the Education and Training of Laboratory Technicians Dr H J T Ellingham (Hon Secretary to the Committee)

A number of Fellows and Associates have continued to serve on various Technical Committees of the British Standards Institution. The following changes in or additions to Institute representation have occurred during the year —

Technical Committee, C/8—Scientific Glassware and Laboratory Ware, Mr W F Bennett in place of Mr E T Osborne, Technical Committee, ISE/8—Sampling and

Analysis of Steel, Mr. E. J. Vaughan appointed; Committee to consider test procedure called for in B.S.187—Sand, Lime, Bricks, Mr. A. T. Green in place of Dr. J. Watson; Technical Committee LBC/8—Qualities of Glassware, Mr. R. Sutcliffe appointed.

The Institute was also officially represented at a number of special events during the year:—The Centenary Celebrations of the Chemical Society—by the President; the Centenary Celebrations of the Institution of Mechanical Engineers—by the President; the Health Congress of the Royal Sanitary Institute—by Mr. Thomas Tickle.

Dr. William Cullen, *Vice-President*, reported to the Council on his visit to South Africa in 1946 when he conveyed greetings of the Council to members of the Cape Section. The Treasurer similarly conveyed greetings to members of the Institute and of the Australian Chemical Institute during a visit to Australia early in 1947. Professor Findlay's mission on behalf of the Institute to India and Pakistan is referred to on p. 112.

The sincere thanks of the Council are accorded to all who have given their time in service on Committees, in acting as representatives of the Institute on other bodies or at special events and in making personal contacts with fellow chemists overseas.

CONSTITUTIONAL AND ADMINISTRATIVE MATTERS

In the Report for 1946 reference was made to the decision to petition for a new Charter for the Institute in which the scope and status of the profession of chemistry and the privileges and obligations of the Institute in relation to it would be restated so as to reflect the developments that have occurred in the range and importance of the applications of chemistry and in the duties and responsibilities of the Institute since the original Charter was granted. At that time the profession that the Institute was designed to promote was described as that of Analytical and Consulting Chemistry. During the past year considerable progress has been made in drafting a petition and the substance of the proposed new Charter and these drafts, after due consideration by the Council, were referred for comment and criticism to the Committees of Local Sections with a view to completing the preparation of agreed documents for submission to the Annual General Meeting in 1948.

It had previously been the intention to proceed at the same time with a general revision of the By-laws of the Institute, but it was found that a few of the proposed By-law changes would not be admissible under the existing Charter. In these circumstances it was thought better to postpone any major revision of the By-laws until after a new Charter had been granted and thus be in a position to examine as a whole the constitutional changes that might be desirable for the Institute's future development.

In arriving at this decision, the Council took particular cognisance of the controversial nature of some of the constitutional changes that had been suggested and hence of the importance of giving plenty of time for their discussion. The question of a new Charter was, however, on a different footing, for few, if any, of the proposals were likely to raise controversial issues.

In the realm of Local Section affairs further consideration has been given to the amount of the annual grant to be made available to each Section and, on the recommendation of the Sixteenth Conference of Honorary Secretaries of Local Sections, it was decided that in future the normal annual grant to

each Section should be £10 plus 2s. 3d. per member, subject to a minimum total of £25. On this basis, the smaller Sections would benefit considerably, as is desirable in view of the fact that there are certain basic expenses which have to be met by every Section however small. It is still the policy of the Council, however, that Local Sections should not accumulate unexpended balances and any surpluses remaining in the hands of Local Sections at 31 December in a given year are deducted from the sum to be paid in respect of the ensuing year, except that a sum of £10 (or 25 per cent. of the normal annual grant, whichever is the greater) is left in the hands of each Local Section as a reserve for meeting expenses that may be incurred in the first month or two of a year before the grant for that year is paid. It is believed that this new scale of grants and improved arrangements for payment will be generally helpful to Local Sections in organising their programmes.

Towards the end of the year a petition was accepted for the formation of a new Local Section to be known as the Mid-Southern Counties Section, serving the Counties of Dorset and Hampshire and the southern part of the County of Wiltshire, and steps have been taken to enable the new Section to come into operation early in 1948. The number of Local Sections in the British Isles will then be 21. During 1947 there were also indications of movements that may lead to the formation of other Local Sections in areas somewhat remote from established centres. It is the policy of the Council to encourage such developments in any locality where there is an obvious need or even where the establishment of a new Section would be likely to attract new members and stimulate useful activity. It is to be recognised, however, that the formation of additional Local Sections will not necessarily entail a corresponding increase in the number of District Members of Council. The relation between Section areas and electoral Districts was under discussion in connection with proposals for amending the By-laws and is a matter that will call for careful consideration when examination of the general constitutional issues is resumed. The problem is by no means a simple one, however, for it may happen—as with the Hull and District Section and the Mid-Southern Counties Section—that a new Local Section takes over an area that had previously belonged not only to two or more Local Sections but also to two different electoral Districts. A complete re-examination of the position in Great Britain is needed and this will undoubtedly be facilitated by the publication of a new edition of the Register of Fellows and Associates, which will provide up-to-date information about the distribution of Members throughout the country.

There have been no notable developments in Local Section organisations overseas, but the visit of Professor Findlay to India, Pakistan and South Africa will no doubt lead to a review of the position of Institute affairs in these Dominions. It has long been recognised that in the Indian sub-continent it is almost impossible to secure the desired amount of activity through a single Local Section, for, although the majority of members are concentrated in a few large centres, the distances between these centres are enormous and movements from one to the other are consequently restricted. The emergence of Pakistan as a separate Dominion also introduces a new factor into the situation.

The decision reported last year to hold two conferences of Honorary Secretaries of Local Sections in each year has already proved its value. These conferences provide an increasingly useful platform for the exchange of ideas on practically all matters with which the Institute is concerned and recommendations made at these conferences (*JOURNAL AND PROCEEDINGS*,

1947, III, 112; VI, 240) have been significant factors in guiding the policy of the Council. Moreover, these meetings at six monthly intervals have enabled Honorary Secretaries to exchange views among themselves as well as to bring their needs directly to the notice of the Officers of the Institute.

The Council again desires to express its appreciation of the valuable and increasingly arduous work undertaken by the Officers and Committees of Local Sections and to accord particular thanks to the Honorary Secretaries not only for maintaining the general activities of their Sections but also for keeping the office of the Institute informed of local developments and aspirations. The Council recognises that the considerable expansion of Local Section programmes effected since the end of the war could not have been achieved without the enthusiasm and energy of those who guide the affairs of the Sections and that much of the success achieved by the Institute in serving the needs of its members is due to their efforts.

FINANCE, HOUSE AND STAFF MATTERS

The Financial Statements for the year 1947 are attached to this report.

In presenting the Accounts for 1946 at the last Annual General Meeting the Honorary Treasurer mentioned that consideration was being given to an improved form of presentation in order to provide members with more information (JOURNAL AND PROCEEDINGS, 1947, III, 101). The main point then in mind was the desirability of showing the values of the Ground Lease and building of the Institute, furniture, library and other property as assets in the Balance Sheet. After consideration of the matter by the Finance and House Committee, with the advice of the Institute's Accountants, it was agreed that this should be done and that, so far as possible, the Financial Statements for 1947 should be presented in such a way that reference to the Balance Sheet would make possible a complete and accurate assessment of the Institute's financial position. Arrangements were accordingly made for the property and chattels of the Institute to be valued as at 31 December, 1947, the valuation of the lease, building, furniture and general equipment being made by the Institute's Surveyors and that of the contents of the Library by a firm of scientific bookdealers. These values are now shown as assets in the Balance Sheet on page 70.

The inclusion of these assets in the Balance Sheet entails making provision for their depreciation, either by writing off certain percentages of the value each year or by making annual appropriations towards a specific reserve fund for use in building up an equivalent alternative asset. In either of these methods the General Income and Expenditure Account has to be debited with the appropriate sums. In respect of property other than the lease and building, it was agreed, after consultation with the Valuers and the Accountants, to adopt the former method and to write off in future years for depreciation 7½ per cent. of the current value of furniture and fittings and 12½ per cent. of that of textbooks in the library (less the value of books presented during the year), but to make no provision for any change in the value of scientific periodicals. In the meantime, an appropriation has been made in the General Income and Expenditure Account and is shown as a deduction from the effective values of these items of property at 1 January, 1947.

In respect of the lease and building, however, it was decided after discussion with the Accountants, that although the value of the lease could be regarded as having fallen to zero in fifty years' time (14 years before its actual expiry), the depreciation could be provided for adequately

by building up a Leasehold Property Redemption Fund by an annual charge on the General Income and Expenditure Account. The amount of this annual charge has been calculated by reference to the annual premiums required for a Redemption Fund Policy that would yield, shortly before the expiry of the lease in the year 2012, a sum equal to the present valuation of the property. This is a much smaller annual sum than is represented by depreciation at the rate of 2 per cent. per annum because of the compound interest which accrues under such a Policy. Moreover, a Redemption Fund Policy to provide £50,000 in the year 2010 was taken out in 1918 and, although premiums on this policy have hitherto been regarded as an investment and have consequently not been met by a corresponding annual charge in the General Income and Expenditure Account, partial provision for replacement of the building at the expiry of the lease has, in fact, been made and the additional premiums necessary to make such provision complete are notably less than they otherwise would be. A further Redemption Fund Policy has therefore been taken out with the Sun Life Assurance Society to provide for a capital payment of £25,000 in the year 1998. In this way a total sum of £75,000, which is £500 in excess of the present valuation of the lease and building, will be available some years before the expiry of the lease. The property will remain at its present valuation in future balance sheets, but an annual appropriation from revenue will be applied to the provision of an asset that will grow as the actual value of the leasehold property diminishes and will reach the present value of the property some years before the lease is due to expire. In order that the value of the Redemption Fund Policy shall not be over-estimated at any time, the surrender value of the Policy will be shown in this and future Balance Sheets.

Charges in respect of depreciation during 1947 have been included in the Financial Statements by estimating the value of the property at 1 January, 1947, on an agreed basis so that members may appreciate the incidence of such charges in future years and their significance in the Balance Sheet.

In past years transactions of a capital nature, such as the sale and purchase of office equipment, have appeared in the General Income and Expenditure Account, but in future they will be shown by changes in the values of the assets in the Balance Sheet.

The practice of crediting Entrance Fees direct to the Balance Sheet has been continued as a means of maintaining and building up capital reserves. On the other hand, certain extraordinary expenditure in 1947, namely, that incurred in providing a Reception for Officers and overseas members of the International Congress of Pure and Applied Chemistry and in connection with Professor Findlay's visit to India and Pakistan, have been charged against reserves in the Balance Sheet because they do not relate specifically to the current year. As foreshadowed in the previous Report it has been decided to charge against the Staff Superannuation Reserve Account in the Balance Sheet that part of the premiums under the Scientific Societies Joint Pensions and Life Assurance Scheme which relates to pensions in respect of past service, recognising that these charges, which are mainly on behalf of two senior members of the staff, are only at their present high level because adequate provision could not be made during the war years and that these sums will fall to a relatively small figure after 1951. Similarly, preliminary expenditure on the preparation of the new edition of the Register of Fellows and Associates has been charged to the Intermittent Publications Reserve.

In order to complete the transformation of the Balance Sheet in

conformity with the new system it has been necessary to introduce on the liabilities side new items representing the original Building Fund and the surpluses on valuation of the building and on other fixed assets. As the principal reasons for establishing a War Contingencies Reserve fortunately no longer apply, it has also been decided to convert this into a General Contingencies Reserve and to transfer to it £2,000 from the accumulated surpluses on Income and Expenditure Account so as to provide for future extraordinary expenditure, including certain sums that will necessarily be required during the next few years.

Reference to the General Income and Expenditure Account shows that the income from annual subscriptions has increased substantially in 1947. This increase is due essentially to the growth in membership (*see p. 48*), but the income from this source again includes some arrears of subscriptions recovered as a result of re-establishing contact with a number of members who were out of touch with the Institute during the war. The only other item of income that calls for comment is that received through the Australia and New Zealand Accounts. While income from these sources is tending to fall off, the decrease in relation to receipts in 1946 is exaggerated through the accounts for the earlier year having covered a period of fourteen months.

On the expenditure side, reference has already been made to the new items for depreciation on movable property and for the Leasehold Property Redemption Fund. These sums are included in the total of expenditure on premises from which appropriate proportions are transferred to the various Special Accounts as part of the overhead charges against them in accordance with the system introduced in the previous year.

Under expenditure on Staff the increase of £981 on salaries is largely accounted for by the appointment of Mr. Raymond as Deputy Executive Officer, on 1 March, 1947, and by certain increments in the salaries of established members of staff. The greatly increased cost of superannuation is entirely due to the additional provision made for future service pensions and life assurance under the Scientific Societies joint scheme in which the Institute has participated since 1 January, 1947, and for which increased expenditure was authorised by the Annual General Meeting on 18 April, 1947. During the year there have been a number of changes in junior staff and it was not possible to secure all the additional assistance that had been authorised to relieve the burden of work that is borne by the permanent staff. The Council desires to take this opportunity of again expressing appreciation of the valuable services rendered by the established members of the staff, often under difficult conditions and frequently involving long hours of work.

Among other changes in expenditure that call for comment are:—The increase in respect of printing and stationery, due to increased costs and growing activities; the decrease in expenditure on postage (excluding that for JOURNAL AND PROCEEDINGS and Lectures, which is shown in the Publications Account), in spite of increased activities, which can be attributed to the additional care taken to avoid, wherever possible, the issue of notices and circulars to members separately from the ordinary publications; the considerable increase in the contribution, made on an agreed percentage basis, to the maintenance of the Chemical Society's Library, due to some extent to special expenses that will probably not be incurred in future; the rise (following last year's fall) in the payment, also on an agreed percentage basis, towards the cost of operation of the Conjoint Chemical Office which has been removed to new premises during the year.

The costs of maintaining the services for which Special Accounts are provided have all increased, even after allowance has been made for the higher charges in respect of staff salaries and overhead expenses. These increases arise from the growth in membership and the expansion of activities. The notable increase in Local Section expenditure follows the decision of the Council to improve the scale of the normal annual grants to meet growing needs.

Before making any appropriation for reserve accounts the General Income and Expenditure Account showed a deficit of £270 14s. 5d. This is increased to £1,270 14s. 5d. as a result of placing £1,000 to the Reserve for Intermittent Publications. In comparing this result with that for 1946, when there was an excess of income over expenditure of £85 9s. 5d. after transferring £2,000 (against £1,000 this year) to reserve accounts, it must be remembered that, apart from increases in actual expenditure in 1947, charges for depreciation and redemption amounting to £1,103 12s. 1d. have been brought in for the first time. Allowing for these differences the result of the year's working is about £1,250 less satisfactory than in 1946.

Finally, the cost of publication of Professor Emeléus's lecture on "Some Aspects of Nuclear Chemistry" has been charged to the Sir Alexander Pedler Fund in accordance with the decision made last year that income from this Fund may be used to finance the publication of lectures or monographs and for other purposes conducive to the progress of chemical science.

BENEVOLENT FUND

The attention of the Benevolent Fund Committee was drawn to six new cases during the year. Two of these needed only short-term loans to tide over temporary financial difficulties, but regular grants were made in two instances: one to the widow of a member who had died suddenly leaving three children of school age; the other to the widow of a member who died some years earlier and whose family were no longer able to provide adequate support. In two of the other new cases consideration was still being given at the end of the year to the question of need for financial help, and it is probable that for one of these a regular grant will be required. It has also been agreed to make a regular grant in continuation of occasional payments of expenses to a Fellow who has been seriously ill and has not been able to resume scientific work. As a result of these changes the sum paid during the year in the form of regular grants has again increased by over £500 on the previous year. The amount of occasional grants also shows an increase of over £100.

Special mention must be made of the generous support received from Imperial Chemical Industries, Ltd., through an annual subscription of £250 under Deed of Covenant for seven years. Mrs. Southerden has kindly made a special donation of £50 to provide an annual subscription to the Fund in memory of her late husband, Frank Southerden, who had been a keen supporter of this work.

The scheme for holidays for children of regular beneficiaries introduced in 1946 has been continued, but as a result of some of the children having now passed the age limit the amount expended has been somewhat less than in the previous year. There is no doubt, however, that this provision has been greatly appreciated and has conferred a real benefit on a number of families represented by 13 children. It has been a pleasure to receive a number of letters from these young people expressing their delight.

A new development during the year has been the provision of food parcels

to regular beneficiaries. When offers were received from the New Zealand Institute of Chemistry and the New Zealand Section of the Institute and from the Toronto Section of the Chemical Institute of Canada to send food parcels to needy members of the Institute, it was decided in accepting these generous offers to give priority to the needs of those who were in receipt of regular grants from the Benevolent Fund. The kindness of the Overseas Members of the Institute and of sister institutions in New Zealand and Canada has been very greatly appreciated by the recipients of these parcels, who have expressed their gratitude to the donors. The Committee of the Benevolent Fund has also sent cordial thanks to all who have helped to bring these additional comforts to those in need.

The total expenditure of the Fund during the year, including sums paid over as loans, was £2,861 15s. 5d. as compared with £2,136 7s. 1d. in 1946; of this expenditure £2,431 3s. 0d. was in respect of grants as against £1,789 4s. 10d. in the previous year. Receipts from members in the form of subscriptions and donations (excluding bequests) amounted to £2,657 8s. 7d., and although this represents an increase of nearly £450 over the corresponding receipts for 1946, this increase has not been sufficient to meet the additional expenditure. In accordance with past practice, donations have been credited to capital, and during the current year the capital account has also benefited by a further sum of £90 17s. 11d. derived from the sale of copies of "What Industry Owes to Chemical Science." Receipt of this substantial sum has been due to the generosity of those who contributed to the new edition of this volume without fee and of Mr. R. B. Pilcher, who has foregone any royalties arising from the publication, as well as of Messrs. Heffer & Sons, who have arranged for the publication on specially generous terms.

In the last Report, preliminary reference was made to the possibility of providing suitable accommodation in hostels and rest homes for elderly members and their wives or for their widows, especially for those whose resources had been adequate before the war to enable them to maintain themselves in reasonable comfort but were no longer sufficient, owing to the increased cost of living and the difficulty in obtaining domestic assistance. This question was pursued during the year and general agreement was reached on the desirability of providing, in the first instance, some kind of residential club in which the residents would have facilities similar to those in a hotel or boarding-house but at a substantially lower payment—perhaps £2 10s. to £3 per week. For this purpose it would be necessary to raise money for the purchase and conversion of an appropriate house or houses, preferably in a country town of moderate size with easy access to churches, cinemas, libraries, shops, etc., and with good railway communication with a large centre of population. Information was obtained as to the finances and organisation of several existing homes and clubs of this type, but it became evident that, in present circumstances, there would be many difficulties to be overcome in purchasing, adapting and administering property for this purpose. The Committee learnt with interest, therefore, that a number of other professional bodies had been consulting together with a view to setting up a joint scheme for the provision of homes of a closely similar type in various parts of the country and was receiving the benefit of the advice of the Nuffield Foundation and of the National Corporation for the Care of Old People on various aspects of the problem. At the end of the year it was decided, therefore, to co-operate in this joint scheme as affording the most promising means of securing at an early date at least a certain amount of accommodation for those in the greatest need.

The Committee has not given up the idea of providing a home to be run by the Institute when conditions permit but has been obliged to conclude that this will not be possible for some years. In the meantime, discussions are proceeding on the constitution and organisation of the joint scheme, and when this is settled an appeal will be made to members for funds to be applied to it in various ways. It is realised that some members will be prepared to give donations and subscriptions or to arrange for annual subscriptions under Deed, whereas others will prefer to advance sums of money on loan. It is hoped to provide a wide range of possible methods by which members of the Institute may furnish support to this important project.

PUBLICATIONS AND LIBRARIES

Publication of the JOURNAL AND PROCEEDINGS in six annual parts was maintained. Among special features were:—An article on the Legal Profession by Dr. J. G. Fife, in the series on “The Organisation of Other Professions” begun by Mr. G. Roche Lynch, O.B.E. (“The Medical Profession,” 1946, V, 209); a review of outstanding current events of interest to chemists, under the title “1947: A Festival Year for Chemistry”; and considerably expanded lists of “Coming Events” in each Part of the Journal.

In the series of Lectures and Monographs published by the Institute the following were printed during the year:—“The Life and Work of George Gerald Henderson,” First Henderson Memorial Lecture, by Professor Sir Ian Heilbron, D.S.O., F.R.S.; “Counting Calories,” Second Dalton Lecture, by Sir Jack Drummond, F.R.S.; “Some Aspects of Nuclear Chemistry,” by Professor H. J. Emeléus, F.R.S.; “The Determination of Alcohol,” Third Tatlock Memorial Lecture, by Dr. J. R. Nicholls; “Nutritional Requirements of Man in the light of War-time Experience,” Eleventh Gluckstein Memorial Lecture, by Sir Jack Drummond, F.R.S. The last two had not been issued, however, by the end of the year, and several others were being prepared for publication.

The re-organisation of the Library of the Institute on the lines previously laid down (JOURNAL AND PROCEEDINGS, 1946, VI, 279) was completed during the year. Several runs of periodicals scheduled for disposal and most textbooks published more than 30 but less than 75 years ago were sold at satisfactory prices (see p. 71).

Improved facilities in the Library of the Chemical Society have been appreciated by Fellows, Associates and Registered Students who have recently visited Burlington House, and use has continued to be made of the arrangements for obtaining books on loan from that Library and from the Science Library at South Kensington.

NOMINATIONS, EXAMINATIONS AND INSTITUTIONS

The Nominations, Examinations and Institutions Committee has continued to meet on the Friday morning before each meeting of the Council and on two occasions the amount of business made it necessary for the Committee to begin its meeting on the preceding Thursday afternoon. The number of applications reported on during the year was 1,544, compared with 1,471 in 1946. The Committee has continued to report also on numerous enquiries and the Examining Sub-Committee has held 21 meetings.

The Regulations have been amended to make it clear that naturalised British Subjects are eligible for consideration as members of the Institute. The Regulations Sub-Committee has reached the stage of drafting new

Regulations for admission to the Fellowship and hopes to be in a position to report on the subject in the near future.

The names of the Sydney Technical College, N.S.W., and of the Norwood Technical College, London, have been added to the list of Institutions recognised for training candidates for the Associateship.

The Council again acknowledges the valuable help of the Advisory Committee in India and of its Honorary Secretary, Dr. G. J. Fowler, for reports and advice on applications and for arrangements made for holding an Examination for the Associateship in India in March, 1948.

By the courtesy of the Universities of Birmingham, Leeds, London and Manchester, of University College, Aberystwyth, and the Royal Technical College, Glasgow, examinations were held in their laboratories. The thanks of the Council are also accorded to several Fellows for individually giving facilities for Examinations.

The entries to examinations and the results are summarised below:—

<i>Associateship:</i>		<i>Examined</i>	<i>Passed</i>
General Chemistry		190	81
<i>Fellowship:</i>			
Branch A. Inorganic Chemistry		—	—
B. Physical		—	—
C. Organic	4	1	
With special reference to High Polymers	2	1	
With special reference to Oils and Fats	1	1	
D. Biochemistry	—	—	
E. Chemistry (including Microscopy) of Food and Drugs and of Water	16	10	
F. Agricultural Chemistry	1	1	
G. Industrial Chemistry			
with special reference to Petroleum	2	1	
with special reference to Paper	1	1	
with special reference to Paint	1	1	
H. General Analytical Chemistry	3	3	
I. Water Supply and the Treatment of Sewage and Trade Effluents	1	—	
Special Examination in Textile Chemistry with particular reference to Cotton	1	1	
Special Examination in Pharmaceutical Analysis	1	1	
	<hr/>	<hr/>	<hr/>
	224	103	

Thus, 46 per cent. of the candidates passed. In 1946 the number of candidates examined was 219, of whom 114 (52 per cent.) passed.

Professor Briscoe has continued to act as Chairman of the Examining Sub-Committee with Dr. J. R. Nicholls as his Deputy, and the following members of Council have also acted as Examiners on the Sub-Committee:—The President, Mr. A. L. Bacharach, Dr. H. Baines, Mr. R. C. Chirnside, Professor W. H. Linnell, Dr. J. G. King and Dr. G. L. Riddell. Of 141 candidates examined orally by the Sub-Committee, 104 passed, of whom 10 had been previously referred for further study and others had been required to present theses or reports. 33 were referred for further study, and 4 failed altogether to satisfy the Examiners.

The thanks of the Council are accorded to the Board of Examiners, to the Sub-Committees, to the Committees of Local Sections for arranging to examine candidates for exemption from preliminary examinations and to many assessors who have reported on papers submitted by candidates.

The names of 163 Registered Students have been removed from the Register for non-compliance with the Regulations.

MEETINGS

Reference was made in the previous Report to the foundation of the Henderson Memorial Lectures through the generosity of Dr. David Spence (Report, 1946, p. 61). In the present year the Gluckstein Memorial Lectures were resumed after a break due to the war, and it was decided that future Meldola Medallists might be invited to give a lecture on some subject related to the work for which the award was made. These developments are reflected in the following list of lectures delivered during the year under the auspices of the Institute:—

First Henderson Memorial Lecture, "The Life and Work of George Gerald Henderson," by Professor Sir Ian Heilbron, D.S.O., F.R.S., on 20 January.

"Some Aspects of Nuclear Chemistry," by Professor H. J. Emeléus, F.R.S., preceding the Annual General Meeting on 18 April.

Eleventh Gluckstein Memorial Lecture, "Nutritional Requirements of Man in the light of War-time Experience," by Sir Jack Drummond, F.R.S., on 20 June.

Meldola Medal Lecture, "Some Applications of Acetylenic Compounds in Organic Synthesis," by Dr. A. W. Johnson, on 17 October.

Thirtieth Streatfeild Memorial Lecture, "The Fertilisers and Feeding Stuffs Act and some Analytical Implications," by Mr. George Taylor, on 21 November.

The following records of meetings held by Local Sections—many of which were arranged jointly with other bodies—have been supplied by the Hon. Secretaries; no reference is made to Annual General Meetings of Sections or to other meetings held solely for the transaction of Section business:—

ABERDEEN AND NORTH OF SCOTLAND SECTION "Recent Advances in the Metabolism of Proteins and Amino-acids," by Dr D P Cuthbertson, "Grinding and Size Reduction. Some Problems met with in the Fertiliser Industry," by Mr R Howard Calvert, "Recent Developments in the Chemistry of Starch and Glycogen," by Professor E L Hirst, F.R.S., "New Methods in Applied Organic Analysis," by Mr Ronald Belcher, "Recent Developments in Synthetic Fibres," by Dr David Traill, "Bond Length Variation in Aromatic Systems," by Professor J M Robertson, F.R.S., Two Christmas Lectures for senior pupils of secondary schools—"Coal and what we get from it" and "Plastics," by Dr Robert Roger

BELFAST AND DISTRICT SECTION "Christmas Crackers," by Dr W Haughton Crowe, Scientific Films, arranged by Mr C S McDowell, "Methods and Apparatus in Inorganic Microchemistry," by Mr R Belcher and Dr Cecil L Wilson, Visit of the President "Some Medico-Legal Experiences," by Mr G Roche Lynch, O.B.E., President of the Institute, "Tuberculin," by Mr L Lochiel McGirr, "Hormones and Sex in Plants," by Mr J H. Harrison, "Water—A National Asset," by Mr H W. Cremer

BIRMINGHAM AND MIDLANDS SECTION: "Atoms and Electrons in Metals," by Dr G V. Raynor, "The Chemical Constitution of the Penicillins," by Dr E Boris Chain, *Nobel Laureate* Scientific Film—"Metal Spraying by the Wire Process"; "The Industrial Control of Size Grading," by Dr E Sharratt, "Chemical Ciphers—a New Systematisation of Chemical Species," by Messrs M Gordon, C E Kendall and W. H. T. Davison, "Bivalent Hydrogen," by Professor L Hunter, "The Dynamics of the Heart and Circulation"—Christmas Lecture for Schoolchildren, by Professor H P Gilding, Lecture and Demonstration on Microchemical Methods in Inorganic Chemistry, by Mr. R Belcher

BRISTOL AND SOUTH-WESTERN COUNTIES SECTION "A Review of X-Ray Work on Long Chain Compounds," by Dr T Malkin, "Fuel and Industry," by Dr C H Lander, C.B.E., followed by scientific film "Steam", "Plastic Flow," by Dr Eley, "Some Recent Advances in Catalysis," by Dr E B Maxted, Visit to the Agricultural and Horticultural Research Station at Long Ashton, Joint meeting with London and South-Eastern Counties Section at Southampton—Discussion on "Local Organisation of

Chemists" and film show; "Water—A National Asset," by Mr. H. W. Cremer; "Physico-Chemical Methods, with special reference to Spectroscopy and Polarography," by Mr. A. S. Nickelson; "The Oxidation of Phenols," by Dr. R. D. Haworth, F.R.S.; "The Manufacture of Tetryl by Continuous Nitration," by Dr. Forster.

CARDIFF AND DISTRICT SECTION: "Recent Progress in Research on Corrosion and Microbiological Corrosion," by Dr. W. H. J. Vernon, O.B.E.; "Dithizone in Trace-metal Analysis," by Dr. H. M. N. H. Irving; "Some Chemical Problems in the Paper Industry," by Dr. Julius Grant; "Explosion Hazards in Industry," by Dr. Matheson; "Organic Chemistry in the Photographic Industry," by Dr. J. D. Kendall; Visit to the Margam Carbide Factory of British Industrial Solvents, Ltd.

DUBLIN AND DISTRICT SECTION: "Chemical Progress in Photography," by Mr. D. Crowley; Visit of the President: "Some Medico-Legal Experiences," by Mr. G. Roche Lynch, O.B.E., President of the Institute; Dublin Colloquium: "The Industrial Utilisation of Agricultural Products and of Seaweed," organised by the Irish Chemical Association and the Dublin Section of the Institute; "Whiskey," by Mr. V. H. M. Bowers; "Intra-molecular Transformations," by Dr. A. K. Mills.

EAST ANGLIA SECTION: "Some Medico-Legal Experiences," by Mr. G. Roche Lynch, O.B.E.; "Available Plant Food in Soil," by Dr. R. Stewart; Scientific films; "The Herring and its Preservation"; Visit to Lowestoft to inspect fishery interests; "Rheology and the Chemist," by Dr. G. W. Scott Blair; "The Electron Microscope," by Mr. N. P. S. Smith; Discussion on "How to become a Chemist."

EAST MIDLANDS SECTION:—"Diazo Compounds," by Dr. H. H. Hodgson; "The Preservation of Meat by Curing, Canning and Cold Storage," by Mr. Osman Jones.

EDINBURGH AND EAST OF SCOTLAND SECTION: "Edmund Knecht," by Mr. F. A. Scholefield; "Fluorescence," by Dr. Neil Campbell; "The Composition and Structure of Proteins," by Professor A. C. Chibnall, F.R.S.; "Modern Ideas of Valency," by Professor Wm. Wardlaw; "Diffusion in Biological Processes," by Dr. Philip Eggleton; "Medico-Legal Experiences," by Mr. G. Roche Lynch, O.B.E.; Two Christmas Lectures to senior schoolchildren by Dr. Philip Eggleton: "The Chemistry of Living: (a) Eating and Drinking, (b) Athletics."

GLASGOW AND WEST OF SCOTLAND SECTION: "Some Developments in the General Methods of Organic Chemistry," by Professor F. S. Spring; Third Tatlock Memorial Lecture: "Alcohol and its Determination," by Dr. J. R. Nicholls; "The Composition and Structure of Proteins," by Professor A. C. Chibnall, F.R.S.; "The Generation of Useful Power from Atomic Energy," by Sir Wallace Akers, C.B.E.; "Some Aspects of the Chemistry of Fluorine," by Dr. B. C. Saunders; "Chemical Products from the Fischer-Tropsch Process," by Dr. C. C. Hall; "Electron Transfer Reactions," by Professor M. G. Evans, F.R.S.; "Economic Security in the Chemical Profession," by Mr. Norman Sheldon; Visit of the President: "Some Medico-Legal Experiences," by Dr. G. Roche Lynch, O.B.E., President of the Institute; Works visits: Imperial Chemical Industries, Ltd., Mossend, Bellshill, Lanarkshire, and Clyde Paper Works, Rutherglen.

HUDDERSFIELD SECTION: "Some Aspects of the Chemistry of Macromolecules," by Professor M. G. Evans, F.R.S.; "Problems in the Chemistry of Starch and Glycogen," by Professor E. L. Hirst, F.R.S.; "Plant Hormones, with special reference to Selective Weed Killers," by Dr. E. Holmes; "Modern Developments in Synthetic Detergents," by Dr. Wm. Baird; "Recent Developments in Partition Chromatography on Paper," by Dr. R. R. Goodall.

HULL AND DISTRICT SECTION: "Spectrographic Analysis," by Dr. A. L. Stubbs; "The Theory of Resonance and Its Importance in the Reactions of Organic Chemistry," by Dr. J. W. Baker; "Recent Developments in Combustion," by Dr. D. T. A. Townend; "Some Aspects of Benzene Substitution," by Professor Brynmor Jones; "The Work of a Public Analyst," by Mr. D. J. T. Bagnall; Visit to the Flixborough Factory of Nitrogen Fertilisers, Ltd.; "Addition Polymerisation," by Professor D. H. Hey; "The Polymorphism and Configuration of Glycerides," by Dr. M. L. Meara; "Patents and the Chemical Literature," by Mr. Leonard E. Jones.

LEEDS AREA SECTION: "The Utilisation of Coal," by Dr. E. G. Ritchie; "Nitration in Sulphuric Acid Solution," by Dr. G. M. Bennett; "The English Oilfields," by Mr. C. M. Adcock, preceded by scientific films.

LIVERPOOL AND NORTH-WESTERN SECTION:—"Synthetic Fats," by Mr. P. N. Williams; "Metabolic Cycles," by Professor H. A. Krebs; "Recent Developments in the Chemistry of Starch and Glycogen," by Professor E. L. Hirst, F.R.S.; "The Complete Analyst," by Mr. R. C. Chirnside; "Forensic Science," by Dr. J. B. Firth; "New Aspects of the

Biochemistry of Sulphur with special reference to Seaweed, by Professor F Challenger, "Entropy—a Simple Re-presentation," by Mr E Woollatt, "Fat Shortages and Fat Substitutes," by Professor T P Hilditch, Demonstration of Scientific Apparatus by the British Association of Chemists, 'The Chemistry of the Transuranic Elements and of Fission Products,' by Professor H J Emeléus, "The Analyst's Function in the Raw Sugar and Molasses Trades," by Mr G W Beaumont, "The Liquid State," by Dr E Moelwyn Hughes, "Our Present Knowledge of the Vitamin B Complex," by Dr T F McCrae, "The Properties of Coal in Relation to its Utilisation," by Dr A C Dunningham, "Some Aspects of Industrial Administration," by Mr R R Butler, "Ion Exchange Materials," by Professor C W Davies, "The Chemistry of Ethylene Polymers," by Professor H W Melville, F R S, "Penicillin," by Dr E Lester Smith

LONDON AND SOUTH-EASTERN COUNTIES SECTION "Recent Advances in Atmospheric Pollution Research," by Dr A C Monkhouse, "British Oilfields and Oil Exploration," by Dr G M Lees, "The Training and Qualifications of Chemists," by Dr A M Ward, "Monomolecular Layers," by Professor E K Rideal, F R S, "Modern Trends in Cereal Chemistry in America and Elsewhere," by Dr D W Kent-Jones "Recent Advances in the Welding of Plant for the Chemical Industry," by Mr W K B Marshall, "Personnel Selection," by Mr L N Coombs, "The Examination of Questioned Documents," by Mr J G N Gaskin, "Some Aspects of Chemistry in Relation to Agriculture," by Dr A H Lewis, "Scientific Problems in Feeding the Modern Army," by Mr J King, "The Atomic Nucleus," by Professor E A Guggenheim, F R S "Luminescent Powders," by Mr C G A Hill, "The Chemist in the Photographic Industry," by Dr H Barnes, "The Construction and Use of Microchemical Apparatus, by Mr J T Stock, and "The Uses of Partition Chromatography for Industrial Analytical Processes," by Mr F A Lyne, followed by an exhibition of microchemical apparatus, Discussion on "Water Treatment," organised by Mr S Stevens, Scientific film displays in various centres Discussions on the organisation of local chemists usually opened by Dr J G A Griffiths, were held in seven centres, Visits The Low Temperature Research Station, Cambridge, the British Launderers' Research Association, Pharmaceutical Specialities (May and Baker), Ltd, The Beecham Research Laboratories Ltd, and the National Fire Service College at Saltdean Registered Students paid visits to the Gas Light and Coke Company's Beckton Works and the London Power Company at Battersea

MANCHESTER AND DISTRICT SECTION Some Aspects of the Chemistry of Fluoro carbons," by Professor M Stacey, Third Dalton Lecture 'Chemistry and Medicinal Treatment,' by Sir Henry Dale, O M, G B E, F R S, 'Fabrics of the Future' Ladies Evening an exhibition opened by Mr R S Greenwood, "Colour Photography in America," by Dr H Barnes, 'The Production and Uses of Laboratory Animals,' by Mr A L Bacharach "Beer," by Mr A J Curtin Cosbie Fourth Dalton Lecture "Chemistry and Fuel," by Dr D T A Townend, "The Probable Generation of Useful Power from Atomic Energy," by Sir Wallace Akers C B E "Crystallisation of Fertilisers," by Dr M P Applebey

NEWCASTLE UPON TYNE AND NORTH EAST COAST SECTION— 'The Training of Chemical Engineers,' by Professor A F Burstall, "The Chemistry of Vitamin A," by Professor Sir Ian Heilbron, D S O, F R S Electronics Applied to Chemistry," by Mr J C Finlay, "The Science of Meat," by Mr H Thornton Visit to Imperial Chemical Industries, Ltd, at Billingham The Organic Chemist and Some Isotopes, by Professor G R Clemo, F R S

SHEFFIELD, SOUTH YORKSHIRE AND NORTH MIDLANDS SECTION Visit to the British Bemberg Works, X-ray and Related Studies of Man-made Fibres by Professor W T Astbury, F R S, Short papers on "The Determination of Carbon, Hydrogen and Nitrogen in Aliphatic Nitro-Compounds," by Mr A E Heron, 'A Review of Micro-Methods for the Determination of Oxygen in Organic Compounds' by Mr C F Spooner, "A New Spot Test for the Detection of Sulphites and Sulphur Dioxide by Messrs R Belcher and C Ingram, "The Micro-Chemical Analysis of Aluminium-Base Alloys," by Messrs J Townend and C Whalley "The Development and Use of Shetland Minerals for Refractory Purposes, by Mr T R Lynam Condensation Resins," by Mr J F Hodgson, "The Polentiometric Properties of Chromium," by Mr B G Skinner, 'Chemical Metallurgy, by Dr H J T Ellingham, "The Function of Sulphuric Acid in Aromatic Nitration," by Dr G M. Bennett, "Chemical Hazards in the Electrical Industry by Mr C P Fagan, "Industrial Health in the Gas Industry," by Mr D Llewelyn

SOUTH WALES SECTION "Forensic Science," by Dr J B Firth, "The Absorption of Light," by Mr E J Bowen, F R S, Visit of Dr. H J T Ellingham, Secretary of the

Institute; "Penicillin, its Preparation and Properties," by Mr. A. L. Bacharach; Symposium on "Polarography"; Scientific films: "Distillation," "Oil from the Earth," "Oil from Iran"; Discussion on "The Chemist in Industry"; "The Economic Utilisation of Fuel Oil in Boiler and Industrial Furnaces and Influence in Modern Refinery Plant," by Mr. A. Pearce.

TEES-SIDE SECTION: "Infra-Red Spectroscopy," by Dr. H. W. Thompson, F.R.S.; "Some Developments in the Use of Metals in Chemical Industry," by Dr. N. P. Inglis; "Recent Developments in the Chemistry of Acetylene Compounds," by Sir Ian Heilbron, D.S.O., F.R.S.; "Water Supply," by Mr. W. Gordon Carey; Symposium on "Evaporites (Salt Deposits)"; "The Mechanism of Electrolytic Dissociation," by Professor W. F. K. Wynne-Jones; "Fume Problems and Sulphuric Acid Manufacture," by Mr. Stanley Robson.

CAPE OF GOOD HOPE SECTION: Visit to the Steenbras Dam and Filtration Plant; "Science and the Arts," by Mr. W. Dawes; "Trace Elements in Relation to Nutrition," by Dr. A. Strasheim; Annual General Meeting, followed by "Some Remarks on the Education and Training of the Chemist," by Dr. A. H. Spong.

INDIA SECTION: Annual General Meeting.

NEW ZEALAND SECTION: Sixth Science Congress of the Royal Society of New Zealand.

OTHER EDUCATIONAL AND SCIENTIFIC MATTERS

In the field of Scientific Courses and Conferences there have been two notable events during the year. On 2-3 July a Colloquium on "The Industrial Utilisation of Agricultural Products and of Seaweed" took place in Dublin under the joint auspices of the Irish Chemical Association and the Institute, the arrangements on behalf of the latter being made by the Dublin and District Section. A Symposium on "Coal, Petroleum and their Newer Derivatives" was held under the auspices of the Institute at St. Andrews on 7-12 July, the arrangements having been made by a Joint Committee of the three Scottish Sections of the Institute. Both of these events were well supported and attracted visitors from considerable distances. The subjects were of outstanding importance in relation to current scientific and industrial developments and the papers contributed were on a very high level. The organisation of both of these conferences has been highly praised by those who attended them, and the Council desires to express cordial thanks to the Officers of the Dublin and District Section and of the three Scottish Sections who were responsible for the detailed arrangements. It is hoped to be able to publish the papers contributed to these conferences as separate volumes, and the Irish Chemical Association has agreed to co-operate over the Dublin Colloquium.

Following the lead given by the Liverpool and North-Western Section in the arrangement of courses on "Oils and Fats" and "Spectroscopy" in 1946, it is held that the scheme for promoting under the auspices of the Institute the organisation of various types of scientific courses and conferences is now well launched and that the experience gained will be of considerable value in the future.

The establishment of the Henderson Memorial Lecture and the decision to resume the series of Gluckstein Memorial Lectures in 1947 were referred to in the previous Report and mention is made above of the way in which these decisions were implemented.

Reference was also made last year to the decision to resume for 1946 the award of the Meldola Medal and to a revision of the Rules governing this award. After reviewing the merits of the candidates, the Committee decided to make two awards for 1946, the recipients being Dr. A. W. Johnson and Mr. R. H. Stokes (*JOURNAL AND PROCEEDINGS*, 1947, III, 136).

Towards the end of 1947 the Councils of the Institute of Metals, the Royal Institute of Chemistry and The Society of Chemical Industry decided

to resume awards from the Sir George Beilby Memorial Fund which had been in abeyance since 1941, and awards for 1947 were made to Dr. G. V. Raynor and Dr. G. R. Rigby.

The competition for the Sir Edward Frankland Medal and Prize for 1946 brought forward several essays, but not one of them was deemed worthy of an award.

Following negotiations with the Ministry of Education, referred to in the last Report, agreement has now been reached on the conditions of award of Ordinary and Higher National Certificates both in Chemistry and in Applied Chemistry. In 1947, 50 schools and colleges submitted candidates for the examinations for the Ordinary and Higher Certificates under the old regulations. The number of entries for the Ordinary Certificate was 426, of whom 254 passed. For the Higher Certificate there were 148 candidates, of whom 110 passed. In the Scottish National Certificate Examination there were 76 candidates for the Ordinary Certificate, of whom 52 passed, and 22 for the Higher Certificate, of whom 15 passed.

Further consideration is being given to the difficult problem of the extent to which National Certificates in Chemistry might be more specifically recognised as a step towards the Associateship of the Institute.

During the year considerable activity took place in the drafting of a proposed course of instruction for Laboratory Technicians under the auspices of a representative joint Committee set up following a conference on the subject convened by the Association of Scientific Workers, the British Association of Chemists and the Association of University Teachers in 1946. By the end of the year a draft of a scheme of instruction with detailed syllabuses covering the Certificate stage of a proposed course had been prepared for distribution to all organisations and individuals having expressed interest in the subject (*JOURNAL AND PROCEEDINGS*, 1947, VI, 234).

STATUS, PRIVILEGES AND EMPLOYMENT OF MEMBERS

The Appointments and Economic Status Committee, to the institution of which reference was made in the last Report, has now become established as a standing committee of the Institute with regular meeting dates. During the year a further co-ordination of activity in this field was achieved by merging two previously existing joint committees of the Institute and the Society of Public Analysts and Other Analytical Chemists, which were concerned respectively with public health matters and economic matters. It had been found that the business of the two joint committees had begun to overlap and that there was an increasingly close relation between their work and that of the Appointments and Economic Status Committee. This latter point has been met by appointing members of the Appointments and Economic Status Committee as the Institute's representatives on the new Joint Committee with the Society of Public Analysts and Other Analytical Chemists.

Questions of status and conditions of employment have been mainly the concern of these two committees but, in so far as status is related to the standards of the Institute's qualifications, the Nominations, Examinations and Institutions Committee is naturally involved (*see p. 58*), and the newly formed Membership Committee (*see p. 49*) has been interested in connection with the value that chemists place on securing these qualifications.

While the standing of the Associateship is generally understood and properly valued, there have been one or two occasions during the year when it has been necessary to correct misunderstandings in the matter,

especially on the part of new organisations or of established bodies concerned with the revision of their grading schemes. For example, a misunderstanding of this kind which was brought to the notice of the Institute by members has been completely cleared up with the National Coal Board since the end of the year and a clear statement has been received from the Director of Establishments that the Board are prepared to regard the Associateship qualification of the Institute as the equivalent of at least a second-class degree at a university. It has also been made clear that it would be a misapprehension to believe that anyone appointed, either to a scientific grade or to a grade of Scientific Technologist, will necessarily remain for all time in the grading he has joined, as the Board has provided cross-ladders between the grades. The importance of ensuring that the status of the Institute's qualifications is publicly recognised has been stressed by the Committee of the Leeds Area Section (*JOURNAL AND PROCEEDINGS*, 1947, VI, 238), and members may be assured that the Council will continue to take steps, whenever necessary, to remove misunderstandings that may be brought to their notice.

Through the Appointments and Economic Status Committee the Institute has been concerned in negotiations with several Government Departments and other national organisations on questions concerning the grading of their scientific and technical staffs, and the confidence inspired by the status and experience of the Institute in these matters has led to useful results, including the removal of certain grievances of individual members.

In view of the diversity of opinions expressed as to changes in salary levels that have occurred in recent years, the Council attaches particular importance to the provision of up-to-date factual information about the remuneration of members, and therefore instituted a further enquiry on the subject. Over 84 per cent. of the Fellows and Associates of the Institute (87 per cent. of those resident in Great Britain and Northern Ireland) responded to the invitation to make an anonymous return of the required particulars, and there is therefore no doubt that the statistics, which will be published in 1948,* will afford a representative picture of the position.

The work of the Appointments Register has been maintained, and lists of vacancies have been issued weekly to members who have asked to receive them. The total number of vacancies notified has been 2,705, of which 482 were brought privately to the attention of the Institute. The total number of members who have availed themselves of this service in some period of the year was 761, including 193 Fellows, 543 Associates and 25 senior Students in their last term of training. At the end of the year 297 members, of whom only 38 were known to be disengaged, were receiving the lists. It is clear, therefore, that members have used this service mainly to secure preferment, rather than employment.

In compiling the lists for the Appointments Register consideration has continued to be given to the salaries and conditions of service offered. Where these were not regarded as satisfactory or likely to attract applicants of the appropriate qualifications, the matter has been taken up with the prospective employers, who have in most instances been glad to accept the advice of the Institute and to modify their offers accordingly. In particular, smaller firms and those without wide experience in the engagement of scientific personnel have acknowledged the value of such advice. During the year there have been not less than a hundred occasions on which the Registrar has been consulted on, or has taken up, questions of remuneration or

* See p. 101

conditions of service. In future, it is proposed, so far as is possible, to keep records of such cases so that the extent of this service, which is for the benefit of both employers and employees, may be made more fully known.

The Officers of the Institute have also been consulted on at least thirty occasions during the year by members seeking advice on contracts of service offered to them. The points raised have been concerned essentially with the reasonableness of particular clauses in a contract and not with questions of legal interpretation. In several instances such points have been taken up with the employer firms and modifications of the terms secured; in some cases the firm has admitted that the contract was drafted by legal advisers without special reference to the employment of professional men and contained restrictions which they had no desire to impose. In one case, where it appeared that a firm was insisting upon undue restraints in a contract of service, the position was investigated by the Appointments and Economic Status Committee, and negotiations are still proceeding.

The general question of the scope of the conditions that may reasonably be included in contracts of service between an employing firm and a chemist has been re-opened on a joint committee of the Institute, the Association of British Chemical Manufacturers and the Standing Committee of Directors of Research Associations, following objections taken by Local Sections, especially the Manchester and District Section (*JOURNAL AND PROCEEDINGS*, 1946, IV, 177), to the document on the subject, previously issued by the joint committee (*JOURNAL AND PROCEEDINGS*, 1945, II, 82). Some progress has been made in the preparation of a document of a different type, consisting of notes on terms of engagement of chemists, but further consideration of certain aspects of the matter is required before an agreed statement can be published.

The outcome of long-drawn-out negotiations with the Ministry of Health, conducted through the joint committee of the Institute and the Society of Public Analysts and Other Analytical Chemists, on the role of the chemist in the examination of potable waters, etc. (*JOURNAL AND PROCEEDINGS*, 1947, VI, 251) has been disappointing, following the decision of the Minister, guided by his Medical Research Council Advisers, to maintain the Public Health Laboratories, which had been largely established to meet war emergencies, as a permanent feature of the new National Health Service. Negotiations on other matters affecting the work of Public Analysts and analytical consultants are being conducted through the joint committee with organisations of Local Authorities.

Towards the end of the year attention was drawn by the Tees-Side Section (*JOURNAL AND PROCEEDINGS*, 1948, I, 3) to the question of how far superannuation benefits might be made transferable when a member moved from one employment to another. This matter is ultimately one for employers to decide and enquiries as to possible schemes had already been made in these quarters, but it has now been agreed to seek authoritative information on the subject for publication, with a view to showing the scope and practicability of such schemes.

EXTERNAL RELATIONS AND PUBLICITY

An Address of congratulation and good wishes was presented to the Chemical Society on the occasion of the celebration of its Centenary, which had been deferred from 1941. At this important event in the history of chemistry, and at the International Congress of Pure and Applied Chemistry which followed it, British chemists had the satisfaction of welcoming and

entertaining in London representatives of cognate societies and institutions throughout the world. A Reception given by the Institute to the Officers and Overseas Members of the Congress was greatly appreciated (*JOURNAL AND PROCEEDINGS*, 1947, V, 202).

At these festivals it was a particular pleasure to meet again many members of the Institute and representatives of sister institutions from other parts of the British Commonwealth, whose co-operation in these difficult times is so greatly valued. During the year closer contacts were established with the Irish Chemical Association through the joint Colloquium held in Dublin (*JOURNAL AND PROCEEDINGS*, 1947, IV, 164) and with chemists in India and Pakistan, through the visit of Professor Findlay to these two new Dominions (*JOURNAL AND PROCEEDINGS*, 1947, V, 229; VI, 287). Professor Findlay's tour and the decision to hold an examination for the Associateship of the Institute in India in 1948 should do much to further scientific education and the organisation of the profession of chemistry in the sub-Continent. His impending visit to South Africa should provide first-hand information on the important steps being taken in that country to improve the professional status of chemists.

The Institute has long been represented on the British National Committee for Chemistry—a committee of the Royal Society which represents British chemistry in overseas affairs—and the decision to circulate minutes of the Committee for the information of the Councils of the participating bodies is a valuable step forward.

On the Chemical Council, now strengthened by representatives of the Society of Public Analysts and Other Analytical Chemists, the Faraday Society and the Biochemical Society, a number of matters of common interest have been discussed, including possible means of improving the supply of laboratory apparatus. On the important question of joint accommodation for the chemical bodies in London, the Council of the Institute has indicated its preparedness to consider any steps that might be taken in this direction, even if on a short-term policy it might be necessary to limit the scheme to bringing the administrative offices of the various bodies under one roof (*JOURNAL AND PROCEEDINGS*, 1947, IV, 158).

The Joint Council of Professional Scientists, in which the Institute participates with the Institute of Physics, the Institution of Metallurgists and representatives of other sciences, has been concerned through its Officers in a number of informal consultations with members of many other professional bodies with a view to exploring the extent of their common interests. The trend of recent legislation and the extension of the activities of trades unions in certain directions has made it desirable that established professional bodies should consult together on means for ensuring that the services they render to their members may be developed on lines most suited to the present-day needs of the community.

In this and many other matters the representation of the Institute on the Parliamentary and Scientific Committee has become of increasing significance. Through meetings of the Committee, not only is contact established with Members of Parliament and representatives of cognate institutions, but much can also be done to ensure that due attention is given to the scientific aspects of national problems. During the year representatives of the Institute on the Committee took part in the work of a sub-Committee that prepared a report on Colleges of Technology and Technological Manpower, and contributed to the discussion of several other important questions.

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DEPUTY EXECUTIVE OFFICER

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RECORDS OFFICER

L. W. WINDER

FINANCE OFFICER

D. A. ARNOLD

FINANCIAL STATEMENTS FOR THE YEAR 1947

REPORT OF THE AUDITORS

We have examined the Balance Sheet at 31 December, 1947, of the Royal Institute of Chemistry, also the Statements of Accounts for the year ended 31 December, 1947, with the books and vouchers.

Subscriptions in arrear are not included in the Balance Sheet. Cash balances with Local Sections have been certified by their Honorary Secretaries or Treasurers. Subject to these remarks, we have obtained all the information and explanations we have required and in our opinion the Balance Sheet and Statements of Accounts are properly drawn up and are in accordance with the entries in the books.

We certify that we have received from the Bank of England and the Westminster Bank, Ltd., certificates that they hold on behalf of the Institute the Investments shown on the Statements of Investments.

J. Y. FINLAY, PEARSON & CO., *Chartered Accountants*;

E. Q. LAWS }
K. A. WILLIAMS } *Hon. Auditors, 1947-48*

9th March, 1948.

BALANCE SHEET 31 DECEMBER, 1947

		1947	1946		1947	
		£ s. d.	£ s. d.		£ s. d.	
1946						
£	BUILDING FUND, 31 December, 1920	.. 20,977 16 4		£	LEASEHOLD BUILDING—at valuation 31 December, 1947*	.. 74,500 0 0
	Surplus on Valuation of Building, 31 December, 1947	.. 53,522 3 8	74,500 0 0	—	FURNITURE, FITTINGS AND EFFECTS—at valuation by Officials of the Institute 1 January, 1947	.. 7,096 13 1
—	SURPLUS on Valuation of other Fixed Assets, 31 December, 1947 7,210 13 8		—	Additional purchases during 1947	.. 290 6 11
—	LEASEHOLD PROPERTY REDEMPTION FUND—per contra 4,267 17 0					7,387 0 0
48,904	INVESTMENT FUND—as scheduled on page 76	.. 50,937 3 1		Less: Items sold during 1947	.. 87 0 0	
	RESERVE ACCOUNTS—			Depreciation	.. 574 0 0	661 0 0
7,100	Intermittent Publications 7,892 15 9				At valuation 31 December, 1947* 6,726 0 0
2,000	Staff Superannuation 1,269 14 6		LIBRARY—		
4,260	General Contingencies 5,260 3 3	14,422 13 6	Contents of Library, at valuation by officials of the Institute at 1 January, 1947 3,073 3 11	
819	SUNDY CREDITORS 1,784 9 4		Additional purchases during 1947 20 3 0	
	RECEIPTS IN ADVANCE—					3,093 6 11
200	Examination Fees 215 5 0		Less: Books sold during 1947	.. 1,045 0 0	
158	Annual Subscriptions 180 6 0		Depreciation on Text Books	.. 45 6 11	1,090 6 11
1,390	Application Fees in Abeyance 1,216 8 0	1,753 12 7			At valuation 31 December, 1947† 2,003 0 0
75	General 141 13 7		LEASEHOLD PROPERTY REDEMPTION POLICY—		
669	INCOME TAX LIABILITY 692 2 0		Surrender value 31 December, 1947 (Sun Life Assurance Society) 4,267 17 0	
158	SCIENTIFIC COURSES AND CONFERENCES FUND 286 2 10				
2,346	SUPERANNUATION SUSPENSE ACCOUNT 2,362 7 9		65,854	INVESTMENTS at cost (as scheduled on page 76) 68,854 13 9
7,920	ACCUMULATED SURPLUS ON INCOME AND EXPENDITURE ACCOUNT, 1 January, 1947 7,920 16 6			STOCK OF STATIONERY at valuation by Officials of the Institute, 31 December, 1947 650 12 0
	Less: Transferred to General Contingencies Reserve	.. 2,000 0 0		572	SUNDY DEBTORS 928 4 4
	Deficit, 1947	.. 1,270 14 5	3,270 14 5		PAYMENTS IN ADVANCE 163 10 0
			4,650 2 1		BALANCES AT BANKERS—	
5,839	London 1,439 17 8				
568	Australia and New Zealand (Sterling value) 701 12 11				
207	Local Sections (as certified by Local Section Officials) 285 4 10				2,426 15 5
	SUPERANNUATION SUSPENSE ACCOUNT INVESTMENT—at cost 2,346 11 4				
	(Market value £2,334 10s. 0d.)					
£75,999		£162,867 3 10	£75,999			£162,867 3 10

* Valuation by Messrs. H. P. Buckingham & Partners, Chartered Surveyors.

† Valuation by professional advisers.

GENERAL CONTINGENCIES RESERVE

Balance, 1 January, 1947	£ 4,260
Transfer from accumulated surplus of Income and Expenditure Account	2,000 0 0
		£ 6,260 0 0

	£	s.	d.
Expenses of Reception (International Congress)	431	19	3
Expenses of Visit to India by Professor Alex. Findlay	567	17	6
Balance, 31 December, 1947, carried to Balance Sheet	<u>5,260</u>	3	3
	<u>£6,260</u>	0	0

GENERAL INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 DECEMBER, 1947

	1946.	1946.	EXPENDITURE.			1947.	1947.	INCOME.			1947.
	£	£	£	s.	d.	£	s.	d.	£	s.	d.
			PREMISES—								
300			Rent ..	300	0				5,902		
533			Rates and Schedule "A" Tax ..	620	10	9					
70			Insurance ..	109	7	7			9,921		
299			Repairs and Maintenance ..	334	10	7					
372			Light, Water, Power and Fuel ..	339	4	0			16,525		
—			Leasehold Property Redemption Fund ..	484	5	2			1,904		
			Depreciation on Furniture and Fittings ..	574	0	0					
	1,574						2,761	18	1		
			Less: Transfers to Special Accounts—								
189			Examinations Account (12%) ..	231	13	0					
189			Local Sections Account (12%) ..	331	13	0					
142			Publications Account (9%) ..	248	15	0					
			Appointments Register Account (5%) ..	138	17	0					
	.975	599					1,050	18	0		
										1,711	0
										1	
			STAFF—								
7,241			Salaries ..	8,222	3	9					
318			Superannuation ..	1,195	7	6					
782			Pensions ..	789	0	0					
	8,341										
			Less: Transfers to Special Accounts—								
			Examinations Account (12%) ..	1,224	15	0					
			Local Sections Account (12%) ..	1,224	15	0					
			Publications Account (9%) ..	918	10	0					
			Appointments Register Account (5%) ..	510	6	0					
	5,147	3,194					3,878	6	0		
										6,328	5
										3	
			OFFICE—								
253			Renewals of Equipment ..	—	—	—					
53			Telephone ..	75	3	5					
413			Printing and Stationery ..	503	3	7					
456			Postage ..	372	8	6					
67			Miscellaneous Office Expenses ..	79	7	8					
	1,242									1,030	3
										2	
			LIBRARY—								
702			Contribution to Chemical Society ..	987	17	7					
24			Sundry Expenses ..	40	8	0					
	726		Depreciation on Textbooks ..	45	6	11					
										1,073	12
										6	
			EXAMINATIONS AND ASSESSMENTS ACCOUNT DEFICIT ..				222	10	7		
202			LOCAL SECTIONS ACCOUNT DEFICIT ..				3,807	6	6		
2,982			PUBLICATIONS ACCOUNT DEFICIT ..				3,053	11	5		
2,714			APPOINTMENTS REGISTER ACCOUNT DEFICIT ..				814	4	9		
508			MISCELLANEOUS—								
1,010			Council and Committee Travelling Expenses ..	1,066	12	4					
37			Officers' Travelling Expenses ..	56	5	4					
28			Advertising ..	133	10	6					
79			Auditors' Honorarium ..	105	0	0					
324			Legal Expenses ..	130	0	0					
94			Donations ..	59	13	0					
200			Presidential Expenses ..	200	0	0					
191			Annual Luncheon and A.G.M. Expenses ..	51	1	5					
10			Conjoint Chemical Office ..	263	14	6					
620			Frankland Award ..	688	16	0					
	2,593		Income Tax ..				2,754	13	1		
			APPROPRIATIONS TO RESERVES—								
1,000			Superannuation Reserve ..	—	—	—					
1,000			Intermittent Publications Reserve ..	1,000	0	0					
85			BALANCE, Excess of Income over Expenditure, 1946 ..	—	—	—					
	£19,174						£21,795	7	4		
			BALANCE, Excess of Expenditure over Income, 1947 ..							1,270	14
										5	
										£21,795	7
										4	

SPECIAL ACCOUNTS for the year ended 31 December, 1947

Examinations and Assessments Account

1946		1947	1946	1947
		£ s. d.		£ s. d.
1,605	Examiners' Honoraria	1,595 2 0	2,971	Examination and Assessment Fees Received
267	Hire of Laboratories and other Expenses	402 11 1		3,467 15 6
80	Printing and Stationery	108 4 0		
23	Postage	28 1 0		
1,009	Proportion of Staff Salaries	1,224 15 0		
189	Proportion of Overhead Expenses	331 13 0	202	Deficit, transferred to General Income and Expenditure Account
		<u>£3,690 6 1</u>		<u>222 10 7</u>
		<u>£3,173</u>		<u>£3,690 6 1</u>

Local Sections Account

£ s. d.	£ s. d.	£ s. d.
969 Section Grants	1,410 5 2	Balances with Local Sections at 31 December, 1947, carried to
193 Secretaries' Conferences	208 5 2	Balance Sheet
564 Printing and Stationery	642 8 0	285 4 10
265 Postage	275 5 0	
1,009 Proportion of Staff Salaries	1,224 15 0	2,982 Deficit, transferred to General Income and Expenditure Account
189 Proportion of Overhead Expenses	331 13 0	3,807 6 6
	<u>£4,092 11 4</u>	<u>£4,092 11 4</u>
	<u>£3,189</u>	

Publications Account

£ s. d.	£ s. d.	£ s. d.
1,062 Journal and Proceedings	1,174 11 9	143 Sale of Publications..
391 Lectures and Monographs	473 13 5	196 2 2
488 Postage	421 2 5	
18 Miscellaneous	13 1 0	
756 Proportion of Staff Salaries	918 10 0	2,714 Deficit, transferred to General Income and Expenditure Account
142 Proportion of Overhead Expenses	248 15 0	3,053 11 5
	<u>£3,249 13 7</u>	<u>£3,249 13 7</u>
	<u>£2,857</u>	

Appointments Register Account

£ s. d.	£ s. d.	£ s. d.
61 Advertising	164 17 3	310 Fees Received
75 Printing and Stationery	103 2 0	279 2 6
183 Postage	176 5 0	
420 Proportion of Staff Salaries	510 6 0	508 Deficit, transferred to General Income and Expenditure Account
79 Proportion of Overhead Expenses	138 17 0	814 4 9
	<u>£1,093 7 3</u>	<u>£1,093 7 3</u>
	<u>£818</u>	

INVESTMENT FUND

	£	s.	d.	£	s.	d.
Investments, at cost, held on 1 January, 1947	65,854	13	9		
<i>Add:</i> Investments made during 1947—						
£1,404 3s. 9d. Savings Bonds 3% 1960-70	1,500	0	0		
£1,474 19s. 2d. Savings Bonds 2½% 1964-67	1,500	0	0		
				<u>£68,854</u>	<u>13</u>	<u>9</u>
Balance of Accumulated Fund 1 January, 1947			48,904	7	0
Funds received for Investment during year—						
Entrance Fees	1,863	18	1		
Life Composition Fees	158	18	0		
Premium on Redemption (3% Defence Bonds)	10	0	0		
				<u>2,032</u>	<u>16</u>	<u>1</u>
Amount Invested in Excess of Life Composition and Entrance Fees	50,937	3	1
				<u>17,917</u>	<u>10</u>	<u>8</u>
				<u>£68,854</u>	<u>13</u>	<u>9</u>

SCIENTIFIC COURSES AND CONFERENCES FUND

	£	s.	d.		£	s.	d.	
Balance, 1 January, 1947	157	9	7	Grant to Dublin Section (Dublin Colloquium) ..	50	0	0
Symposium at St. Andrews: Attendance Fees	310	16	0	Symposium at St. Andrews: University Fees ..	850	12	0
Residence Fees and other Fees	886	2	6	Coach Tours ..	33	10	0
	<u>£1,354</u>	<u>8</u>	<u>1</u>	Travelling Expenses of Lecturers ..	39	10	11	
				Printing and Stationery ..	12	18	11	
				Miscellaneous Expenses ..	81	13	5	
				Balance of Fund, 31 December, 1947, carried to Balance Sheet ..	286	2	10	
					<u>£1,354</u>	<u>8</u>	<u>1</u>	

Subscriptions and Fees paid in and retained in Australia and New Zealand, 1947

		<i>Receipts.</i>	<i>Expenditure</i>
		£ s. d.	£ s. d.
Balances: 1 January, 1947—			
On Deposit	605 5 9		
Current Accounts	92 0 7		
		<hr/>	
Subscriptions—			
Fellows	48 6 0		
Associates	85 16 9		
		<hr/>	
Life Composition Fees	134 2 9		
Application and Assessment Fees	21 0 0		
Interest on Deposit Account	43 1 0		
		3 13 10	
Grant to New Zealand Section		20 0 0	
Expenses and Bank Charges		2 2 10	
Balances: 31 December, 1947—			
On Deposit	806 7 1		
Current Accounts	70 14 0		
		<hr/>	
		*877 1 1	
		<hr/>	
	£899 3 11	<hr/>	£899 3 11

* Sterling value £701 12s. 11d.

Statement of Subscriptions and Fees Received, less Outgoings

	£ s. d.	£ s. d.
Subscriptions—		
Fellows	48 6 0	
Associates	85 16 9	
	<hr/>	
Life Composition Fees	134 2 9	
Application and Assessment Fees	21 0 0	
Interest on Deposit Accounts	43 1 0	
	3 13 10	
	<hr/>	
Less: Grant to New Zealand Section	20 0 0	
Expenses and Bank Charges	3 13 10	
	<hr/>	
	23 13 10	
	<hr/>	
Loss, if converted to Sterling	178 3 9	
	44 2 6	
	<hr/>	
Balance, in Sterling, carried to the General Income and Expenditure Account	£134 1 3	
	<hr/>	

STATEMENT OF INVESTMENTS HELD AND DIVIDENDS RECEIVED DURING 1947

	Holding, £ s. d.	Cost, £ s. d.	Value 31 Dec., £ s. d.	Interest, £ s. d.	Tax deducted, £ s. d.	Net, £ s. d.
Great Western Railway Debenture Stock, 2½%	500 0 0	384 16 3	455 0 0	12 10 0	—	6 17 6
L. M. S. Railway Redeemable Preference Stock, 5%, 1955	500 0 0	503 0 0	507 10 0	25 0 0	11 5 0	13 15 0
L.M.S. Railway Preference Stock, 4%	2,000 0 0	1,843 15 1	1,650 0 0	80 0 0	36 0 0	44 0 0
Southern Railway Redeemable Guaranteed Preference Stock, 5%, 1957	1,000 0 0	1,174 6 2	1,115 0 0	50 0 0	22 10 0	27 10 0
Commonwealth of Australia Stock, 3½%, 1964-74	4,000 0 0	3,985 5 7	4,120 0 0	130 0 0	58 10 0	71 10 0
New Zealand Loan, 5%, 1949	1,000 0 0	1,141 8 0	1,055 0 0	50 0 0	22 10 0	27 10 0
Port of London Authority Registered Stock, 3½%, 1965-75	1,000 0 0	1,033 4 9	1,025 0 0	35 0 0	15 15 0	19 5 0
London County Councils, 3½%, 1954-59	1,000 0 0	1,046 8 0	1,055 0 0	35 0 0	15 15 0	19 5 0
London County Councils, 3½%, 1956-61	100 0 0	100 5 6	101 10 0	3 0 0	—	3 0 0
War Loan, 3½%	13,000 0 0	13,554 16 8	13,390 0 0	455 0 0	—	455 0 0
Conversion Loan, 3½%	750 0 0	738 19 6	787 10 0	26 5 0	11 16 2	14 8 10
Defence Bonds (Conversion Issue), 2½%	1,000 0 0	1,000 0 0	1,000 0 0	27 10 0	—	27 10 0
War Loan, 3%, 1955-59	500 0 0	500 0 0	510 0 0	15 0 0	6 15 0	8 5 0
National War Bonds, 2½%, 1951-53	8,300 0 0	8,300 0 0	8,424 10 0	207 10 0	93 7 6	114 2 6
National War Bonds, 2½%, 1952-54	8,500 0 0	8,500 0 0	8,585 0 0	212 10 0	95 12 6	116 17 6
Savings Bonds, 3%, 1955-65	3,000 0 0	3,000 0 0	3,060 0 0	90 0 0	40 10 0	49 10 0
Savings Bonds, 3%, 1960-70	1,000 0 0	1,000 0 0	1,010 0 0	30 0 0	13 10 0	16 10 0
Metropolitan Water Board "B" Stock, 3%	4,000 0 0	4,022 0 3	3,980 0 0	120 0 0	54 0 0	66 0 0
Savings Bonds, 3%, 1965-75	4,000 0 0	4,026 8 0	4,060 0 0	120 0 0	54 0 0	66 0 0
Savings Bonds, 3%, 1965-75	7,000 0 0	7,000 0 0	7,105 0 0	210 0 0	94 10 0	115 10 0
National War Bonds, 2½%, 1954-56	2,000 0 0	2,000 0 0	2,020 0 0	50 0 0	22 10 0	27 10 0
Defence Bonds, 3%	1,000 0 0	1,000 0 0	1,000 0 0	30 0 0	—	30 0 0
*Savings Bonds, 3%, 1960-70	1,404 3 9	1,500 0 0	1,418 5 0	21 1 3	9 9 6	11 11 9
*Savings Bonds, 2½%, 1964-67	1,474 19 2	1,500 0 0	1,401 5 0	18 8 7	8 5 10	10 2 9
Interest on Deposit	— —	— —	— —	7 15 7	— —	7 15 7
	£68,854 13 9	£68,835 10 0	£692 4 0	£1,369 6 5		
	£2,061 10 5					

* Purchased 1947

† 3% Defence Bonds converted May, 1947

BENEVOLENT FUND ACCOUNTS for the year ended 31 December, 1947

Current Account

	1946 Receipts.	1947 Receipts.	1946 Payments.	1947 Payments.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1,265 18 7	Balances 1 January, 1947—	1,54 15 0	Grants .. .	269 17 8
For Current purposes 1,091 16 7		1,634 9 10	Regular Payments .. .	2,161 5 4
Post Office Savings		125 0 0	Loans Granted .. .	210 0 0
2,500 0 0	Bank .. .	103 0 0	Childrens' Holiday Grants .. .	87 10 0
		100 0 0	Donation to Reed's School .. .	100 0 0
1,111 15 0	Subscriptions .. .	3,591 16 7	100 0 0	.. .
	Annual Subscriptions and Deeds of .. .	1,044 0 2	5 5 0	.. .
568 16 0	Covenant .. .	820 6 1	Audit Fee .. .	5 5 0
259 14 1	Dividends and Interest .. .	276 19 3	13 17 3	Printing and Postage .. .
	Post Office Savings Bank Interest .. .		1,091 16 7	Balances 31 December, 1947— .. .
— — —	(accrued) .. .	161 5 0	2,500 0 0	For Current Purposes 949 6 5
— — —	Income Tax Recovered .. .	328 13 9		Post Office Savings Bank .. .
2 0 0	Loans repaid .. .	88 1 0		2,500 0 0
20 0 0	Grants repaid .. .	— — —		.. .
				3,449 6 6
£5,728 3 8		£6,311 1 10	£5,728 3 8	£6,311 1 10

Capital Account

	1946 Receipts.	1947 Receipts.	1946 Payments.	1947 Payments.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
552 8 10	Balance, uninvested capital, 1 January, 1947 .. .	790 3 8	Investments—	
537 14 10	Donations .. .	793 2 4	Post Office Savings	
200 0 0	Bequests .. .	— — —	Bank .. .	152 17 10
	Proceeds "What Industry Owes to .. .		Trustee Savings Bank 1,250 0 0	0 0
— — —	Chemical Science" .. .	90 17 11		1,402 17 10
			Balance, uninvested capital 31 December .. .	1,402 17 10
£1,290 3 8		£1,674 3 11	£1,290 3 8	£1,674 3 11

BENEVOLENT FUND: Balance Sheet as at 31 December, 1947

1946			1947			1946			1947		
f	s.	d.	f	s.	d.	f	s.	d.	f	s.	d.
12,807	5	0	Capital Account, accumulated balance	..	13,691	5	3				
2,500	0	0	Current Account Reserve	..	2,500	0	0				
1,091	16	7	Current Account Balance	..	949	6	5				
	-	-	"Residential Clubs" Fund	..	15	1	0				
4	2	6	Sundry Creditors	..	4	2	6				
			85	17	2						
			544	12	4						
			1,200	0	0	Post Office Savings Bank (Interest)	247	2	2
						Current Account	653	5	9
						Deposit Account	200	0	0
						Sundry Debtors	139	8	1
			<u>£16,403</u>	<u>4</u>	<u>1</u>				<u>£17,159</u>	<u>15</u>	<u>2</u>

BENEVOLENT FUND: Investments held and Dividends received during 1947

	Holding.	Cost.	Value 31 Dec.	Interest.	Tax deducted.	Net.
	f	s.	d.	f	s.	d.
Consols, 4%	1,000	0	0	1,077	13	0
War Loan, 3½%	1,200	0	0	1,296	3	0
Port of London Authority Registered Stock, 3½%, 1965-75	500	0	0	516	17	11
Commonwealth of Australia, 3½%, 1964-74	400	0	0	398	10	7
New Zealand Loan, 5%, 1949	500	0	0	570	14	6
National War Bonds, 2½%, 1951-53	4,250	0	0	4,250	0	0
National War Bonds, 2½%, 1952-54	200	0	0	200	0	0
Conversion Stock, 3½%, 1952	500	0	0	501	19	6
Corporation of London Debentures, 3%, 1957	240	0	0	238	1	0
London Electric Transport Finance Corporation Debenture Stock, 2½%, 1950-55	275	0	0	267	1	10
Savings Bonds, 3%, 1955-75	1,100	0	0	1,100	0	0
Defence Bonds, 3%	1,000	0	0	1,000	0	0
†London Trustee Savings Bank	1,250	0	0	1,250	0	0
Post Office Savings Bank (Capital Account)	752	17	10	752	17	10
Post Office Savings Bank (Current Account)	2,500	0	0	2,500	0	0
Interest on Deposit Account	-	-	-	-	-	-
				161	5	0
				5	13	5
				-	-	-
				-	-	-
				5	13	5
			<u>£15,919</u>	<u>19</u>	<u>2</u>	
			<u>£15,951</u>	<u>2</u>	<u>10</u>	
			<u>£510</u>	<u>5</u>	<u>1</u>	
			<u>£72</u>	<u>0</u>	<u>10</u>	
			<u>£438</u>	<u>4</u>	<u>3</u>	

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† Deposited November, 1947.

SIR ALEXANDER PEDLER FUND

Current Account for the year ended 31 December, 1947

	£ s. d.	£ s. d.
Uninvested Balance, 1 January, 1947	395 19 5
Dividends and Interest	173 4 0
		<hr/> £569 3 5

Balance Sheet as at 31 December, 1947

	£ s. d.	£ s. d.
Accumulated Balance of Fund	7,120 4 0
Sundry Creditors	118 6 5
		<hr/> £7,238 10 5

Statement of Investments held and dividends received during 1947.

Holding.	Cost. £ s. d.	Value. £ s. d.	Interest. £ s. d.	Tax deducted. £ s. d.	Net. £ s. d.
Great Western Railway, 5% Consolidated Preference Stock	100 94 0 0	120 10 0	5 0 0	2 5 0	2 15 0
War Loan, 3½%	2,600 2,808 6 0	2,678 0 0	91 0 0	- 7 -	91 0 0
Port of London Authority, 3½% Registered Stock, 1965-75	500 516 17 11	522 10 0	17 10 0	7 17 6	9 12 6
Southern Railway Redeemable Guaranteed Preference Stock, 5%, 1957
New Zealand Loan, 5%, 1949
Consols, 4%
London Electric Transport Finance Corporation Debenture Stock, 2½%, 1950-55
National War Bonds, 2½%, 1951-53
National War Bonds, 2½%, 1951-53
National War Bonds, 2½%, 1952-54
†Defence Bonds, 2½%
	<hr/> £7,059 0 9	<hr/> £6,904 10 0	<hr/> £222 15 0	<hr/> £49 11 0	<hr/> £173 4 0

† Purchased during 1947.

STREATFEILD MEMORIAL FUND

31 December, 1947

£200 War Loan, 3½%. Value £206 0s. 0d.

	£ s. d.		£ s. d.
Balance, 1 January, 1947 ..	104 17 8	Balance on Deposit, 31	£ s. d.
Dividends and Interest ..	7 0 0	December, 1947 ..	111 17 8
	<hr/> <hr/>		<hr/> <hr/>
	£111 17 8		£111 17 8

MELDOLA FUND

31 December, 1947

£75 Commonwealth of Australia 3½% Stock. Value £77 5s. 0d.

	£ s. d.		£ s. d.
Balance, 1 January, 1947 ..	15 4 11	Balance on Deposit, 31	£ s. d.
Dividends and Interest ..	1 6 10	December, 1947 ..	16 11 9
	<hr/> <hr/>		<hr/> <hr/>
	£16 11 9		£16 11 9

J. M. GLUCKSTEIN MEMORIAL LECTURE FUND

31 December, 1947

£240 Conversion Loan, 3½%. Value £251 5s. 0d.

	£ s. d.		£ s. d.
Balance, 1 January, 1947 ..	342 6 11	Balance on Deposit, 31	£ s. d.
Dividends and Interest ..	4 12 6	December, 1947 ..	346 19 5
	<hr/> <hr/>		<hr/> <hr/>
	£346 19 5		£346 19 5

HENDERSON MEMORIAL LECTURE FUND

31 December, 1947

£1,497 19s. 0d. National War Bonds, 2½%. Value £1,432 0s. 0d.

	£ s. d.		£ s. d.
Endowment by Dr. David Spence (1946) ..	1,625 0 0	Purchase of War Bonds	1,500 0 0
Dividends and Interest ..	10 6 0	Memorial Lecture, 1947 ..	108 10 11
	<hr/> <hr/>	Balance on Deposit, 31	26 15 1
	£1,635 6 0	December, 1947 ..	£1,635 6 0

PROCEEDINGS OF THE COUNCIL

Council Meeting, 16 January, 1948.—It was reported that drafts of the Petition and proposed new Charter had been sent to Local Section Committees for their observations and it was agreed that their comments would be considered by Council at the next meeting.

As a further step towards the establishment of the Mid-Southern Counties Section, invitations had been issued to Fellows and Associates having their registered addresses in the area to make nominations for election to the Committee of the Section.

Further reports were received of the progress of Professor Findlay's mission in India and Pakistan (*see p. 112*).

Arrangements for the Anniversary Meetings of the Institute, to be held in Birmingham in conjunction with the Annual General Meeting, were approved. Regret was expressed that the date of the latter event coincided with that of the Annual General Meeting of the Institution of Chemical Engineers; steps would be taken to avoid such clashes in the future.

The Report of the Finance and House Committee (12 January), which was adopted, referred to financial arrangements for the publication of papers presented at the Irish Colloquium in July, 1947 (*JOURNAL AND PROCEEDINGS, 1947, IV, 164*), to the loan of chemical balances to the University of London in connection with the Institute's examinations and to sundry routine matters.

In adopting the Report of the Benevolent Fund Committee (12 January) the Council endorsed a recommendation for participation in a joint scheme being worked out by the benevolent organisations of a number of professional institutions and similar bodies to provide homes or residential clubs for their beneficiaries. It had been recognised (*JOURNAL AND PROCEEDINGS 1948, I, 5*) that the proposals previously considered for establishing a residential club for elderly members and their wives, or for their widows, under the auspices of the Institute alone would involve many difficulties at the present time and it was concluded that many of the immediate objects in view might be more readily and effectively attained by collaboration with other institutions, especially as the experience of the Nuffield Foundation and the National Corporation for the Care of Old People would be available in the development of a joint scheme of the type envisaged. The question of launching an appeal to members of the Institute for funds to be used in support of the scheme would be further considered when details of its organisation and administration had been worked out.

Reports of the Nominations, Examinations and Institutions Committee (19 December, 1947, and, in part, 16 January, 1948) were adopted and candidates recommended for election to the Fellowship or to the Associateship were duly elected to their respective grades.

A report received on the reasons given by three Fellows and twenty-one Associates for tendering their resignations during the past three months showed that only in one instance was there any serious dissatisfaction with the policy or services of the Institute. Most of the resignations were due to financial stringency, especially on retirement from active work, or to members having taken up occupations not related to chemistry.

The Report of the Publications and Library Committee (8 January) which was received and adopted referred *inter alia* to:—Lectures, Monographs and Symposia for publication or pending; a detailed scheme for the content and arrangement of entries in the forthcoming edition of the Register

of Fellows and Associates, with special reference to the schedule of honours, decorations and qualifications to be included.

The Council agreed to a request from the Committee of the London and South-Eastern Counties Section for permission to establish contact with firms and institutions in Hertfordshire with a view to obtaining detailed information on the demand for part-time technical education in that county. This had arisen from a report prepared by the Section Committee on possible ways in which facilities for the training of chemists in the Section area might be improved (*JOURNAL AND PROCEEDINGS*, 1948, I, 3).

A memorandum was received from the London and South-Eastern Counties Section advocating the publication of a leaflet on the facilities offered to students by the Institute and other chemical bodies, addressed particularly to those who were not already Registered Students of the Institute. The memorandum and accompanying draft of a proposed leaflet were referred to the Membership Committee in view of that Committee's special concern with these matters.

Dr. E. H. Farmer had accepted the Council's invitation to attend, as a delegate of the Institute, the Rubber Technology Conference to be held in June, 1948.

Council Meeting, 20 February, 1948.—After the Minutes of the previous meeting had been confirmed, Members of Council stood as a mark of respect to the memory of Dr. Bernard Dyer and Dr. George McGowan, both of whom had been elected to the Associateship in 1878 and had died during the past week aged 91 and 95 respectively.

Comments on the drafts of the Petition and proposed new Charter received from Local Section Committees were considered and a number of suggestions adopted. In view of the generally favourable reception accorded to these drafts it was agreed to proceed at once, in consultation with the Institute's Solicitors, with the preparation of the documents in their final form for submission to the Annual General Meeting, 1948, with a resolution of the Council recommending their adoption.

Further particulars were received from Professor Findlay of the progress of his tour in India and Pakistan (*see p. 112*).

At the Annual General Meeting of the Indian Section, held at Patna on 1 January, 1948, and attended by Professor Findlay, a resolution had been passed asking that approval be given in principle to the establishment of four Local Sections of the Institute to serve the needs of members in the Dominion of India, these Sections being centred on Bombay, Calcutta, Delhi and Madras-Bangalore. The terms of this resolution had been communicated formally by the Hon. Secretary of the existing Indian Section and a letter strongly supporting the proposal was received from Professor Findlay. A memorandum, signed by a number of prominent chemists in Lahore, following Professor Findlay's visit to that city, was also received asking that approval be given in principle to the establishment of a Local Section of the Institute for Pakistan, centred on Lahore. These requests were received by the Council with satisfaction and the principles involved were approved on the understanding that the areas served by the proposed Bombay, Calcutta, Delhi and Madras-Bangalore Sections would be confined to the Dominion of India and that, if a Pakistan Section were formed, it would be in all respects a separate entity. The Council agreed on preliminary steps to be taken to facilitate the constitution of the proposed new Local Sections in India and Pakistan and to assist in the further development of the profession of chemistry in the two Dominions. The thanks of the

Council were ordered to be conveyed to Professor Findlay for the valuable work he had done in stimulating interest in Institute affairs in the places so far visited by him.

It was reported that arrangements for the Anniversary Meetings to be held in conjunction with the Annual General Meeting of the Institute in Birmingham (*JOURNAL AND PROCEEDINGS*, 1948, I, 41) were in hand and that, as no notices of motion had been received under By-Law 5 (2), any Special Business to be transacted at the Annual General Meeting could now arise only on resolutions submitted by the Council itself.

The Council then proceeded to nominate candidates for election as Officers, General Members of Council and Censors for 1948-49. Mr. G. Roche Lynch was unanimously re-nominated to the office of President, Dr. D. W. Kent-Jones to that of Hon. Treasurer, and Professor H. V. A. Briscoe, Mr. G. Elliot Dodds, Professor A. Findlay and Mr. A. J. Prince as Vice-Presidents. As Mr. Bacharach and Dr. Cullen were ineligible for re-election as Vice-Presidents, there were two vacancies to be filled, and it was agreed to add the names of Professor F. Challenger and Mr. E. T. Osborne to the list of nominees for office as Vice-Presidents.

Nominations of the following nine Fellows as candidates for election as General Members of Council under By-Law 26 were received:—Dr. C. C. Addison, Mr. F. R. Ennos, Dr. J. G. A. Griffiths, Dr. D. W. Hill, Dr. S. H. Jenkins, Mr. S. J. Johnstone, Mr. E. Myer, Dr. H. C. Smith and Mr. S. G. E. Stevens. Ballot having been taken, the following twenty-four Fellows were nominated or re-nominated as candidates for election as General Members of Council under By-Law 25:—Dr. Norman Booth, Professor Harold Burton, Mr. R. C. Chirnside, Mr. C. L. Claremont, Professor J. W. Cook, Professor W. M. Cumming, Mr. G. J. Denbigh, Mr. M. B. Donald, Dr. H. H. Hodgson, Professor L. Hunter, Dr. W. Idris Jones, Dr. F. M. Lea, Professor W. H. Linnell, Dr. R. P. Linstead, Dr. F. G. Mann, Miss M. Olliver, Mr. J. A. Oriel, Dr. G. L. Riddell, Professor E. K. Rideal, Dr. F. Roffey, Dr. J. L. Simonsen, Mr. R. W. Sutton, Dr. E. Vanstone and Mr. P. N. Williams.

The following five nominations were made in connection with the election of four Censors:—Mr. Lewis Eynon, Professor Alexander Findlay, Professor Sir Ian Heilbron, Dr. Harold Moore and Professor W. Wardlaw.

It was agreed that the first meeting of the new Council to be elected at the Annual General Meeting on 16 April be held on Friday, 7 May, 1948, and that a meeting of the Nominations, Examinations and Institutions Committee be held on the morning of that day.

The Reports of the Finance and House Committee (16 February) and the Benevolent Fund Committee (16 February), which were mainly concerned with routine matters, were adopted. The congratulations of the Council were ordered to be conveyed to Mr. D. A. Arnold, Finance Officer of the Institute, on his having passed the final examination for the Associateship of the Chartered Institute of Secretaries.

Reports of the Nominations, Examinations and Institutions Committee (16 January and, in part, 20 February) were adopted and candidates recommended for election to the Fellowship or to the Associateship were duly elected to their respective grades. Dr. W. Preston was appointed Examiner for the Fellowship in Branch G, Industrial Chemistry, in succession to Mr. H. W. Cremer.

The Report of the Membership Committee (17 January), which was adopted, was concerned mainly with:—a modification of the application

form for admission to the Fellowship; the status of the Institute's qualifications; means for bringing the advantages of membership and studentship of the Institute and other chemical bodies more directly to the attention of post-graduate and undergraduate students, e.g. by the giving of lectures or informal talks in universities and technical colleges, by the provision of informative pamphlets on the lines of the Chemical Council brochure, but specially directed to students (as proposed by the London and South-Eastern Counties Section); the provision of "careers talks" in schools. Further discussion of these matters was in progress.

The Report of the Appointments and Economic Status Committee (10 February) was largely concerned with the preparation and presentation of remuneration statistics derived from replies to the questionnaire issued towards the end of 1947. In adopting the Report the Council authorised the publication of certain tables of remuneration statistics and an explanatory statement accompanying them (*see p. 101*). The publication of these statistics should serve to correct some of the more gloomy opinions that have been expressed on the relation between the average remuneration of chemists and that of other salary and wage earners (cf. JOURNAL AND PROCEEDINGS, 1946, IV, 162; 1948, I, 9). The Report also referred to consultations in progress with representatives of a national organisation on the status accorded to the Associateship of the Institute in connection with their grading schemes, and with officers of the Ministry of Fuel and Power concerning appointments and conditions of service of Gas Examiners under the provisions of the Gas Bill.

The Council also endorsed the conclusions of the Appointments and Economic Status Committee on two points put forward in a resolution of the Committee of the Leeds Area Section which had been referred to them (JOURNAL AND PROCEEDINGS, 1947, VI, 237). On the first point, the Council did not agree with the suggestion "that the Institute should retain a legal expert to give free advice to members on contracts of service" and confirmed its previous rejection of this proposal on the following grounds:—

- (i) The Institute should not take any step which might encourage members to go to law unless absolutely necessary, for such action is commonly to the disadvantage of the member and of the Institute.
- (ii) The officers of the Institute are available for consultation on contracts of service and have been so consulted in hundreds of cases within the Registrar's experience where members have, in the first instance, desired to obtain legal advice but have subsequently been satisfied that legal advice was neither necessary nor desirable. On the very rare occasions when legal advice has been found to be needed, members have been put in touch with a suitable solicitor. When the officers desire the help of a solicitor in advising members, they are authorised to obtain it.
- (iii) Few, if any, of the points arising when a member is asked to sign a contract of service are legal ones, they usually concern questions as to whether or not particular clauses are harsh or unsuitable. In many cases where difficulties have arisen, correspondence between the Institute and the prospective employer has led to suitable modifications in a contract. Such difficulties usually arise with smaller firms without much experience of employment of scientific men.
- (iv) Few, if any, of the professional institutions (as distinct from Trade Unions) offer free legal advice to individual members.

On the other hand, in matters of principle likely to affect the interests of the profession as a whole, the Council was prepared to consider the extent to which the funds of the Institute could be used for legal action. The second point in the resolution of the Leeds Area Committee appeared to be based on a misapprehension as to the practice in a certain professional Institute.

Clearly the appointment of anyone to act as an Assessor in matters relating to the interpretation of a contract of service would have to be at the instance of or with the consent of both parties. Such an appointment might well be accepted or made by the President of a professional institution at the request of the parties concerned in a dispute arising, for example, on the terms of a partnership. An example of how provision was sometimes made in a contract of service for the President of a professional institution to nominate one of three Arbitrators on matters arising out of or concerning the contract was afforded by paragraph 15 of the document (now withdrawn for revision) entitled "Suggested clauses for incorporation in Contracts of Service for Chemists" (JOURNAL AND PROCEEDINGS, 1945, II, 82).

The Council received the interim Report of the Committee on the Education and Training of Laboratory Technicians, copies of which were being sent to all organisations and individuals who had expressed interest in the subject, inviting their comments and suggestions (cf. JOURNAL AND PROCEEDINGS, 1947, V, 234).

On a report that the Films Sub-Committee of the London and South-Eastern Counties Section was prepared to co-operate with the Scientific Film Association in the appraisal of films of chemical interest, appreciation of this offer was expressed and authority given to the Section Committee to co-operate through its Sub-Committee in this valuable work.

Minutes of the meeting of the Chemical Council (19 November, 1947) were received (see JOURNAL AND PROCEEDINGS, 1948, I, 14).

The Council approved proposals by the Chemical Council for the admission of the Institution of Chemical Engineers to the Chemical Council, with co-option of two representatives, and for the appointment of a committee of enquiry to discuss the general question of publicity for British chemistry.

Minutes of a meeting of the British National Committee for Chemistry (29 January) were received, referring *inter alia* to the appointment of Professor J. W. Cook and Professor E. C. Dodds as delegates to the Fourth South American Congress of Chemical Science at Santiago, Chile.

A request was received from the North Jersey Section of the American Chemical Society for the names of any members of the Institute who would be in the U.S.A. in the winter 1948-49 and might be willing to address the Section on current trends and developments in their own country.

Mr. E. T. Osborne, O.B.E., *Member of Council*, was re-appointed as representative of the Institute on the Chemical Divisional Council of the British Standards Institution.

Mr. F. B. Marmoy, *Associate*, was invited to attend as an observer on behalf of the Institute a Conference on the Expansion of Higher Education to be held at Oxford on 20-21 March.

ACTIVITIES OF LOCAL SECTIONS

Aberdeen and North of Scotland.—On 23 January, through the courtesy of Professor H. W. Melville, F.R.S., members were afforded an opportunity of seeing some of the research work being carried out in the Chemistry Department of the University of Aberdeen. After an introductory talk had been given by Dr. Burnett, the meeting divided into parties which were conducted around the research laboratories, where demonstrations and explanations were given by Dr. Peaker and Messrs. Grassie, Masson and Robb. The subjects dealt with were "Reactions of Atomic Hydrogen," "The Operation of a Molecular Still" and "Determination of Molecular Weights and Dimensions of High Polymer Molecules by Light Scattering and Osmometry."

Dr. R. B. Strathdee, Chairman of the Local Section, presided, and expressed to the research workers the thanks of the meeting for a most interesting evening.

On 27 February, a meeting in the Chemistry Department, Marischal College, Aberdeen, was addressed by Dr. A. W. Johnson, of Cambridge, on "Application of Acetylenic Compounds in Organic Synthesis." Dr. R. B. Strathdee occupied the chair, and, after discussion had taken place, a vote of thanks was accorded the lecturer on the motion of Dr. R. H. Thomson.

Belfast and District.—On 2 January, 1948, the Christmas Lecture, "A Chemical Christmas Tree," was given by Dr. C. L. Wilson to an invited audience of school children. Taking as his starting point the candle-flame and the snow of the Christmas-tree, which, to a casual observer, typified the extremes of heat and cold, Dr. Wilson, using a "tree of temperature" and illustrating his lecture by lantern slides and experiments, dealt with important points on the temperature scale from the hottest known temperatures down to absolute zero. The lecture concluded with a selection of experiments illustrating the unusual effects experienced at the temperature of liquid air.

At a joint meeting with the Local Section of the Society of Chemical Industry and the Chemical Society on 13 January, Mr. A. J. Howard read a paper on "Some Aspects of the Tinplate and Can Manufacturing Industries," which was thoroughly enjoyed by all the members.

Bristol and South-Western Counties.—A joint meeting with the Society of Chemical Industry Engineering Group and the Chemical Society was held in the Chemistry Lecture Theatre, University of Bristol, on 4 December, 1947. Dr. E. B. Maxted presided. A paper was read by Dr. Forster on "The Manufacture of Tetryl by Continuous Nitration." The author described details of the chemical reactions involved and the plant development undertaken in working out a satisfactory process, which resulted in a great increase in production of this vital war material. A discussion followed and a vote of thanks to the lecturer was proposed by Professor W. E. Garner.

A joint meeting with the Society of Chemical Industry and the Chemical Society was held in the Chemistry Lecture Theatre, University of Bristol, on 15 January, 1948. Dr. T. Malkin presided. A paper was read by Mr. G. H. Osborn, Chief Analyst, British Drug Houses, Poole, entitled "Recent Developments in the use of Organic Reagents in Chemical Analysis." The lecturer gave a survey of the growth of the use of organic reagents during the last forty years and referred to the increase in accuracy and saving in time, labour and expense as a result. Many reagents were described in detail, as was the application of polarography, chromatography and electrometric titration. A survey of research work being carried out on new reagents was also given. After the paper there was a lengthy discussion, followed by a vote of thanks to the lecturer moved by Professor T. Wallace, C.B.E., M.C.

A special meeting of the Section in conjunction with the Society of Chemical Industry and the Chemical Society was held in the Beaufort Room, Grand Hotel, Bristol, on 5 February, 1948.

After a buffet tea there was a discussion on "The Local Organisation of Chemists," at which Dr. T. Malkin presided. There was a good attendance at the meeting, with representatives present from as far as Exeter and St. Austell. The Hon. Secretary described the constitution of the Section, the way in which the joint programme of the three Chartered Bodies was arranged and recent changes that had occurred in the geographical area of the Section. The Chairman then threw the meeting open to discussion and invited members to express their opinion of programmes and to make suggestions for alteration or improvement.

After the discussion there was a scientific film show at which "The Refining of Oil" and "Taken for Granted" were exhibited. At the end of the meeting Dr. T. Malkin proposed a vote of thanks to Messrs. J. S. Fry & Sons, Ltd., for the loan of the projection equipment.

A joint meeting of the Chemical Society, the Society of Chemical Industry and the Royal Institute of Chemistry was held in the Chemistry Lecture Theatre, University of Bristol, on 12 February, 1948. Dr. C. E. H. Bawn presided and a paper entitled "The Formation of Ethylenic Polymers" was read by Dr. H. W. Melville, F.R.S. Following a discussion, a vote of thanks was proposed by Dr. Eley.

A joint meeting of the Society of Chemical Industry, the Chemical Society, the Institute and the Institute of Fuel was held in the Chemistry Lecture Theatre, University of Bristol, on 19 February.

A very interesting paper was read by Dr. D. T. A. Townend, entitled "Recent Developments in Combustion." Dr. Townend described recent advances in the fundamental knowledge of the combustion of solid, liquid and gaseous fuels and how the rapid accumulation of facts relating to the mechanism of slow combustion had been

largely due to the problem of "knock" in internal combustion engines. Slides were shown of the down jet method of combustion in fuel beds and after the lecture demonstrations were given of thermal diffusivity within fuel pieces and the mutual support of combustion by solids burning in close proximity.

Following the paper, there was a lively discussion and a vote of thanks was proposed by Professor Wilson Baker.

East Anglia.—On 30 January, at Ipswich, interesting papers were delivered by Mr. W. H. Ferguson and Mr. Nancarrow on "Modern Developments in Protective Coatings." Mr. Ferguson dealt in detail with developments in paints from three aspects: treatment of oils, resin constituents and methods of application. The varied requirements for paints and their scientific formulation and investigation were described. Mr. Nancarrow discussed recent applications of plastic coverings as protective coatings under various conditions.

At Norwich, on 13 February, Professor G. T. Tryhorn lectured on "Forensic Science," outlining the growth of scientific aids to criminal investigation and the functions of the Forensic Science Laboratories and describing specific cases in which scientific assistance had played its part. Instructive slides illustrated the points made by the lecturer and a stimulating discussion followed. The audience included officers of the Norwich City Police and, in proposing a vote of thanks, the Chief Constable added an appreciation of the valuable assistance given to police investigators by the Forensic Science Laboratories.

East Midlands.—The November meeting was held at Derby and was addressed by Dr. S. J. Folley, who took for his title "The Biology of Lactation." This meeting was very well attended and members were rewarded by hearing an excellent lecture and a very lively discussion.

Through unforeseen circumstances the December meeting was cancelled.

In January a meeting was held at Leicester to which members of the Leicestershire Section of the British Medical Association were invited. The lecturer was Professor Eric Boyland, of the Chester Beatty Research Institute, who took for his title "Chemical Carcinogenesis and Experimental Chemotherapy of Cancer." This meeting was particularly interesting and it is hoped that a summary will be prepared for publication in due course.

The February meeting was held in Loughborough, when Dr. Edgington spoke on "Chemical Engineering Aspects of Handling Sterile Medical Products." The lecture was well illustrated with slides and specimens. It was gratifying to find that the attendance at Loughborough was well above the average, which augured well for the Section.

Edinburgh and East of Scotland.—At the Annual General Meeting of the Section held on 12 February, 1948, Mr. R. G. Thin was elected Chairman and Dr. I. A. Preece Vice-chairman. Mr. G. Elliot Dodds and Mr. Bryce Douglas were re-elected Secretary-Treasurer and Recorder respectively and Messrs. G. Barclay, D. Lloyd, K. F. Macbean, E. G. V. Percival, F. M. Potter and D. Stewart were elected to fill vacancies on the Committee. Mr. H. H. Campbell was re-elected Honorary Auditor.

Huddersfield.—A meeting was held on 6 February in Field's Café, Huddersfield, when D. H. Baines gave a lecture entitled "The Chemist in the Photographic Industry." The meeting was well attended and the lecture was followed by a good discussion.

Leeds Area.—A meeting of the Section was held at the University of Leeds on 12 January, 1948. Professor F. Challenger presided and Professor E. G. Cox lectured on "Electrostatic Hazards in Chemical Industry." There was a large audience and the ensuing questions and discussion revealed widespread interest in the subject among chemical industrialists of many kinds. (For summary, see p. 99.)

A meeting was held in the University of Leeds on 9 February, 1948, Mr. G. J. Denbigh, Chairman of the Section, presiding. Professor M. G. Evans lectured on "The Mechanism of Oxidation-Reduction Reactions" to a large and appreciative audience whose keen interest was manifested in the number and variety of questions which followed. A vote of thanks was proposed by Dr. C. G. Addingley and seconded by Mr. H. J. Ewart.

London and South-Eastern Counties.—Three marked trends are shown in the Spring Programme of the London and South-Eastern Counties Section: lectures by eminent speakers, meetings arranged in the extra-metropolitan areas of the Section and lectures designed for Students and young Associates.

The programme opened with a meeting in Central London on 21 January, when Mr. H. N. Linstead, O.B.E., M.P., addressed sixty members and visitors on "Science in Parliament." The second London meeting followed on 18 February, when Mr. Lionel Heald, K.C., gave a very informative lecture on "The Function of the Expert Witness

in Litigation." The zest with which the one hundred members present joined in the discussion was ample proof of the success of the meeting. Dr. J. G. A. Griffiths took the chair at both these meetings.

Lectures by eminent speakers were not confined to London. On 9 February, Dr. F. A. Freeth (of Imperial Chemical Industries Limited) addressed a joint meeting of the Section and the Alembic Club at Oxford on "The Relationship between Academic and Industrial Research." This meeting had the added distinction of being held under the Chairmanship of Sir Robert Robinson, P.R.S.

Dr. Freeth's paper was repeated at Cambridge on 20 February, when, under the Chairmanship of Dr. F. G. Mann, F.R.S., the Section held a joint meeting with the Cambridge University Chemical Society.

On 24 February the Section held a joint meeting with the Welwyn Scientists Club, to hear a paper by Professor D. H. Hey of King's College, London, entitled "Reactions of Benzoyl Peroxide."

The needs of Students and young Associates were catered for in meetings at Gravesend and Slough. At Gravesend, on 27 January, Dr. C. W. Herd read a paper "The Chemist in the Flour Mill." The Chairman at this meeting was Mr. S. G. E. Stevens. At the meeting at Slough on 12 February the Section enjoyed the hospitality of Messrs. Horlicks, Ltd., when Dr. G. L. Riddell, *Member of Council*, read a paper entitled "The Chemistry of Packaging." The meeting was under the Chairmanship of Dr. J. G. A. Griffiths.

These two papers were written with the needs of Students and young Associates in view and described the work of chemists in the two fields discussed in order to give young chemists some insight into the part which chemistry plays in modern industrial life.

This account would not be complete without some reference to the work that the Section Committee has been steadily pursuing on the appraisal of films for chemical audiences. This work was reflected in two film shows which were given at Acton Technical College on 29 January and at Norwood Technical Institute on 23 February. The films shown at these meetings included "Nagana" (Destruction of the tsetse fly by D.D.T.), "Taken for Granted" (Sewage disposal), "Twenty-four Square Miles" (The problems of rural communities), "Malaria," "Refining of Oil" and "Nutrition of Ruminant Animals."

Manchester and District.—A joint meeting with the Chemical Society and the Society of Chemical Industry was held at the Engineers' Club, Manchester, on 29 January, 1948. A lecture on "Nitration by mixtures of Nitric and Sulphuric Acids" was given by Dr. G. M. Bennett, C.B., F.R.S., the Government Chemist. Mr. Stanley Best was in the Chair. A vigorous discussion followed; it was opened by Professor Kenner and several of the large audience present took part. The vote of thanks was proposed and seconded by Dr. Baddeley and Dr. Hock respectively, two former students of Dr. Bennett.

Sheffield, South Yorkshire and North Midlands.—A paper entitled "Science and the World Situation" was read on 30 January, by Mr. N. S. Hubbard, at the Royal Victoria Hotel, Sheffield. The lecturer dealt with the challenge to freedom in the pursuit of science and to the expression of scientific thought in the world to-day. The subject provoked considerable discussion among members and it was evident that Mr. Hubbard had stimulated much thought on a matter of vital importance to the future of science.

Dr. R. A. Mott moved a vote of thanks and expressed the warm appreciation of the meeting to the lecturer.

South Wales.—On 28 January a meeting was held jointly with the Cardiff and District Section at the Mining and Technical Institute, Bridgend, Mr. H. F. Adams presiding. A lecture on "Dithizone in Trace-metal Analysis" was given by Dr. H. M. N. H. Irving.

Members of the Section have attended, by invitation, lectures arranged by the Chemical Society which were held in various centres in the Section area as follows: 19 January, "The Physical Chemistry of some Vacuum Metallurgical Processes," by Dr. Philipp Gross, at University College, Swansea; 29 January, "Reactions of the Ethylene Bond," by Professor D. H. Hey, at the University College of North Wales, Bangor; 30 January, "Some Recent Advances in the Theory of Polymerisation," by Professor D. H. Hey, at the University College of Wales, Aberystwyth; 9 February, "Free Radical Reactions in Hydrocarbon Chemistry," by Dr. C. E. H. Bawn, at University College, Swansea; 13 February, "Some Aspects of Solid Reactions," by Professor W. E. Garner, C.B.E., F.R.S., at the University College of North Wales, Bangor.

The Local Section Committee has considered the question of Local Section facilities for members in the North Wales area and a statement was issued in order to stimulate discussion on possible ways by which the present position could be ameliorated. On 27 February a meeting was held at the Denbighshire Technical College, Wrexham, in order to consider the suggestions embodied in the statement. Mr. W. D. Williams, District Member of Council, presided and was supported by Mr. E. E. Ayling, Hon. Sec., South Wales Section, and Mr. Ashley Jones, representing the Liverpool and North-Western Section. After a brief discussion, the meeting expressed unanimous approval of the proposal that a new Section should be formed to serve the North Wales area, to include the Counties of Anglesey, Caernarvonshire, Denbighshire, Flintshire, Merionethshire and Montgomeryshire. The following Committee was appointed to organise the presentation of a petition to the Council of the Institute: Dr. W. Rogie Angus, Bangor; Dr. J. W. Barrett and Mr. N. F. Rapps, Ruabon; Mr. K. L. Graham, Flint; Dr. S. R. Illingworth, Wrexham; Mr. V. H. Williams, Penrhyneddraeth.

Tees-side.—The film "Atomic Physics" was shown to an audience of 200 on 15 January.

Professor J. W. Cook, F.R.S., lectured on 20 January, on "The Chemical and Biochemical Oxidation of Polycyclic Aromatic Hydrocarbons." A summary will appear later.

At a joint meeting with the Newcastle Section of the Society of Chemical Industry, on 14 February, Dr. H. Baines spoke on "The Photographic Latent Image." Dr. Baines described the Gurney-Mott theory of the latent image and the explanations it furnished of a number of photographic phenomena.

New Zealand.—The Twenty-first Annual Meeting of the Section was held at Wellington on 21 January, 1948, under the Chairmanship of Mr. W. A. Joiner. In the Annual Report it was noted that the membership stood at 85 (32 Fellows and 53 Associates), an increase of 8. The joint Annual Conference with the New Zealand Institute of Chemistry, held in May, 1947, formed the chemistry section of the 6th Science Congress of the Royal Society of New Zealand (see JOURNAL AND PROCEEDINGS, 1947, V. 200). The Chairman's address was postponed to a combined meeting at Auckland on 30 September (for summary, see p. 92). The Joint Employment Committee sent out 16 circulars during the year, listing 216 vacancies: there were far more vacancies than applicants to fill them.

The following officers were elected for 1948: Chairman, Mr. W. A. Joiner; Secretary, Mr. R. L. Andrew (in succession to Dr. J. K. Dixon); Auditor, Dr. J. K. Dixon; Committee: Mr. F. H. V. Fielder (Auckland), Dr. H. R. Whitehead (Palmerston North), Mr. G. A. Lawrence and Mr. M. L. H. Stewart (Wellington), Mr. H. O. Askew (Nelson), Dr. R. O. Page (Christchurch) and Mr. O. H. Keys (Dunedin).

PROCEEDINGS OF THE CHEMICAL COUNCIL

Abstract of the Minutes of the Meeting held on 21 January, 1948.

1. The Chairman reported that the Constitution of the Council for 1948 was as follows:—

The Chemical Society: Mr. F. P. Dunn (*ex-officio*), Professor D. H. Hey, Professor C. N. Hinshelwood, Dr. R. P. Linstead.

The Royal Institute of Chemistry: Professor Alex. Findlay, Dr. D. W. Kent-Jones (*ex-officio*), Professor W. H. Linnell, Dr. G. Roche Lynch.

The Society of Chemical Industry: Mr. A. L. Bacharach, Mr. H. W. Cremer, Mr. Julian M. Leonard (*ex-officio*), Mr. Stanley Robson.

The Society of Public Analysts and Other Analytical Chemists: Mr. Lewis Eynon, Mr. G. Taylor.

The Faraday Society: Dr. G. M. Bennett, Professor W. E. Garner.

The Biochemical Society: Dr. J. H. Birkinshaw, Dr. J. H. Bushill.

The Association of British Chemical Manufacturers: Mr. R. Murdin Drake, Dr. G. M. Dyson, Sir Harry Jephcott, Mr. Foster Sproxton.

2. Honorary Officers for the year 1948 were elected as follows:—

Chairman, Professor E. K. Rideal; Vice-Chairman, Dr. R. P. Linstead; Honorary Treasurer, Professor Alex. Findlay; Honorary Secretary, Dr. G. M. Bennett; Deputy Honorary Treasurer, Dr. J. H. Bushill.

3 The Chairman, in moving a vote of thanks to the retiring Vice-Chairman, Mr F P Dunn, expressed on behalf of the Council their great appreciation of the valuable services Mr Dunn had rendered as Vice-Chairman during the last three years. The vote of thanks was carried with acclamation. A vote of thanks to the retiring members of Council for their services was also carried unanimously.

4 Matters relating to the supply of laboratory apparatus and to the question of general publicity to British Chemistry received further attention.

5 It was decided to circulate a schedule of the days of the month and times of the day when Council and Standing Committee meetings of certain organisations are held in London, prepared by the Council, to various Societies for their information and publication if possible.

6 Joint Student Facilities under the Joint Subscription Scheme were granted to five applicants.

Abstract of the Minutes of the Meeting held on 24 February, 1948.

1 It was reported that the Councils of the three Constituent Bodies had approved a recommendation from the Chemical Council that a Committee of Enquiry should be appointed to consider the general question of publicity for British chemistry. It was agreed that, in order to insure the appointment on the Committee of persons best suited to this task, suggestions should be invited from all the bodies represented on the Chemical Council.

2 The general question of accommodation for the Constituent Bodies and kindred societies was further discussed.

3 Dr G M Bennett was nominated as the representative of the Chemical Council to attend the Royal Society Scientific Information Conference, 21 June-2 July, 1948.

4 Joint Student Facilities under the Joint Subscription Scheme were granted to four applicants.

SUMMARIES OF LECTURES

COAL AS A SOURCE OF ENERGY IN NEW ZEALAND

By W A JOINER, M Sc, F R I C, A M I Chem E

[New Zealand Section, Auckland, 30 September, 1947]

Resources of energy form the basis of modern civilisation and are of fundamental importance in industries, both primary and secondary. A small part of the energy received from the sun is stored up in organic materials, such as coal and petroleum, and as elevated water which can be made to do useful work. Permanent resources of energy include direct solar radiation, the tides, wind, the movement of inland water and organic materials, such as vegetation, which may be continuously replaced. A solar salt works designed to produce New Zealand's requirements of about 50,000 tons of salt a year is in course of construction. Hydro electric power is of great importance in New Zealand. The resources available, though not developed, are estimated at 10 million kilowatts. Natural steam is another minor source of energy that might be developed, whilst atomic energy has tremendous possibilities for the future.

The only important non permanent source of energy in New Zealand is coal, which supplies over 70 per cent of the Dominion's energy requirements. A Coal Survey was begun in 1936 geological data are supplemented by studies of the possibility of economic mining and the physical and chemical properties of the coals. New Zealand coals may be classified as bituminous, sub bituminous and lignites. Bituminous coals have high calorific value, yield coke when heated and are valuable as boiler fuel and for the manufacture of gas. Sub bituminous coals have a lower calorific value, do not coke and are useful for domestic fuel and steam raising. They may be blended with rich bituminous coals for gas making.

The work of the Coal Survey is supervised by a Committee of the Council for Scientific and Industrial Research and is carried out by staff of the Geological Survey, the Mines Department and the Fuel Section of the Dominion Laboratory.

Systematic sampling is of the utmost importance. Samples are of two kinds: seam samples are taken where access to the face of the seam is possible, or from outcrops (with due regard to the effects of weathering); run of mine samples are designed to be representative of the whole output of a colliery at the time of sampling.

In the laboratory the proximate analysis—so-called "fixed carbon," "volatile matter," moisture, ash and sulphur contents—is carried out on all samples. Coking properties are evaluated by determining the swelling number and agglutinating value. The Gray-King carbonisation apparatus is used to study the behaviour of coals on carbonisation. Ultimate analyses for C, H, N, etc., are also frequently required. Calorific value is important from the point of view of the industrial user and so is the fusion or softening temperature of the ash. Most New Zealand coals are comparatively low in ash. Some coals, particularly from the Waikato mines, yield ash having a remarkably high content of boron (the highest found was 44·8 per cent. B_2O_3): this may be connected with the presence of boron in the hot spring waters of the thermal regions about Lake Taupo.

Information on all mines is recorded systematically, the National One-mile Series of maps of the Lands and Survey Department being used—169 maps for the North Island and 191 for the South. Mines and workings in any coal-field are numbered consecutively in chronological order of the date on which they began operating, whether still producing or not. Reports and Information Circulars are issued regularly.

Latest estimates (in tons) of coal resources in New Zealand are shown in the following table:—

Class of Coal	Proved Recoverable	Probably Recoverable	Inferred
Anthracite	Very little	Very little	—
Bituminous	14,160,000	56,190,000	—
Sub-bituminous	139,094,000	103,992,000	321,000,000
Lignite	147,000,000	377,000,000	—
Totals	300,254,000	537,182,000	321,000,000

Reserves of bituminous coal are relatively small, and in consequence resources must be conserved (i.e. coal must be used efficiently and the different kinds of coals used as far as possible for the purposes for which they are best suited) and the technology of utilisation must be studied afresh.

Some 800,000 tons of coal are used annually in industry in New Zealand, mostly as boiler fuel. A Fuel Efficiency Service has been started to advise factories, hospitals and other large consumers. It is estimated that, without any costly alterations to plant, a saving of about 20 per cent. could be achieved.

The gas industry uses nearly 300,000 tons of coal a year, mostly bituminous. The reserve position would be satisfactory but for the fact that most of the remaining bituminous coals are relatively high in sulphur, which causes difficulties in purification. If the gas industry is to be maintained or expanded, it will be necessary to devise ways of utilising the more highly sulphurous coals or of using sub-bituminous coals or lignites. Experiments are in progress on the application of liquid gas-purifying processes. The return from the sale of recovered sulphur for acid manufacture would offset to a considerable extent the cost of purification. The removal of organic sulphur compounds also presents a difficult problem.

The Lurgi process of gasification with steam and oxygen under pressure seems particularly applicable to sub-bituminous coals and lignites such as occur in New Zealand. In this process, coal is fed in at the top of a vertical, cylindrical, water-jacketed vessel with a refractory lining, steam and oxygen are introduced and ash is removed continuously at the bottom. The fuel is dried by the hot gases leaving the generator and then passes downwards through successive zones in which carbonisation (with tar production), gasification and combustion take place. The gas first formed by the reaction of steam and oxygen with the fuel rises to a zone of lower temperature where methane-forming reactions take place. The proportion of methane increases with increasing pressure and decreases with increasing temperature. In practice a pressure of 20 atmospheres is used and the temperature is kept as low as possible compatible with the reactivity of the fuel, which increases with temperature. Although the ash from the sub-bituminous coals has a melting-point of 1,000–1,100° C., it is considered that these coals would be so highly reactive that gasification could be carried out below this temperature, so avoiding the formation of clinker.

The production of town gas by the enrichment of water-gas with methane, synthesised from part of the water-gas, is another process that might be applicable to New Zealand conditions. Preliminary steps have been taken to explore the possibilities of these methods.

The quantity of coal required for domestic purposes is about 900,000 tons a year, much of which is wasted through the inefficiency of domestic heating appliances.

PHYSICO-CHEMICAL METHODS

By A. S. NICKELSON, B.Sc., A.R.I.C.

[Bristol and South-Western Counties Section, 23 October, 1947]

Many of the classical chemical methods using gravimetric or volumetric finishes are now quite unsuitable for plant control or inspection purposes, as the techniques either are laborious or require highly qualified staff. Physico-chemical methods are therefore tending to replace the purely chemical methods as apparatus becomes available. Colorimetric, polarographic and spectrographic methods all have their special merits and should be used with regard to the particular analytical problem involved.

Polarography is a form of micro-electrolysis in which the current arising from the boundary layer in contact with a cathode is measured with a galvanometer. The cathode can be a rotating platinum micro-electrode or a series of mercury drops. It can be shown that this current is a function of the normal diffusion forces in the solution and is therefore proportional to the concentration of the reducible ion. Current voltage curves are produced by means of a drum camera or pen-recording system; the position and height of the steps record the nature and amount of the reducible substances. In Mazak alloys 0.001 per cent. of copper, lead, tin, iron and cadmium can be determined with an accuracy of ± 5 per cent. Trace elements in aluminium, copper alloys and steels are readily determined and the polarograph is also useful in the analysis of aldehydes, aliphatic amines, aromatic nitro- and azo-compounds, aldoses, alkaloids and proteins. An interesting development is that due to J. E. B. Randles, who obtained traces of the current voltage curves during the life-time of a drop on a cathode-ray tube. The cathode-ray polarograph is used as a routine and research instrument.

The spectrograph is most useful in the analysis of inorganic materials for trace constituents up to about 1 per cent. The quartz and grating spectrographs both have advantages; the latter, with its uniform dispersion, is particularly useful for complex spectra in the 4,000 to 7,000 Å region. Close control over every step from the electrode preparation to the final interpretation of the spectra on the photographic plate is essential for quantitative work. An accuracy of ± 15 per cent. can be obtained by direct visual reading using a Judd Lewis Comparator, whilst greater accuracy (± 5 per cent. or better) is attainable with the aid of a non-recording microphotometer.

In analysing an inorganic material, a flux containing ferric sulphate is added to the material in a known proportion. The mixture is made into pellets and spectrographed on copper electrodes using the direct current arc. The densities of the spectrum lines due to the material are compared with those due to iron, using a table of line pair equalities prepared from the spectra of standard mixtures. The interpretation of a very faint spectrum line adjacent to a more dense spectrum line presents some difficulty and can only be achieved satisfactorily by recording a trace of the spectra photographically. By this means a ten-fold gain in sensitivity is obtained. Greater speed of operation has been gained by the development of a cathode ray microphotometer, which enables the spectrum density pattern of any portion of the photographic plate to be recorded as a trace on the cathode tube.

To overcome some of the disadvantages inherent in the photographic procedure and to increase speed of operation, the direct measurement of spectrum line densities, using photo-multiplier tubes, is under active investigation. Dieke and Crosswhite, by a repeated scanning method, obtain traces similar to those produced on a recording microphotometer. Saunderson, Caldecourt and Petersen integrate the electric charges from the photo-multiplier tubes in a condenser over a period of 20 seconds. By suitable relays in conjunction with a D.C. amplifier the densities are finally recorded as line lengths on a chart and can be related to the concentration of the element in the sample. Quantitative results are thus obtainable in less than one minute with an accuracy comparable to that given by the photographic method.

OUR PRESENT KNOWLEDGE OF THE VITAMIN B COMPLEX

By T. F. MACRAE, O.B.E., D.Sc., Ph.D., F.R.I.C.

[Liverpool and North-Western Section, Wigan, 1 November, 1947]

The factors included in the vitamin B complex vary with each individual's ideas. The following are accepted, well-established members: aneurine, riboflavin, nicotinic acid, pyridoxine, pantothenic acid, biotin and folic acid. All have been characterised and synthesised. There is, in addition, a group of factors that has been tacked on to the vitamin B complex for convenience and with varying degrees of justification. Amongst such factors are choline, inositol and *p*-aminobenzoic acid. There undoubtedly

also exist still undiscovered factors that will eventually find their place in the vitamin B complex. Only the well-established factors are dealt with here.

In recent years the biochemical function of several of the B vitamins has been elucidated. It is now clear that the B vitamins owe their importance to the fact that they are concerned in enzymic reactions. Indeed, they are the functional parts of various coenzymes.

Aneurine pyrophosphate has been proved to be cocarboxylase, which is required for the decarboxylation of pyruvic acid. Aneurine pyrophosphate is also concerned in other reactions in carbohydrate metabolism. Riboflavin phosphate in combination with adenylic acid yields the important coenzyme, first discovered by Warburg, which is concerned with various enzymic oxidations. This vitamin in different chemical combination is also involved in other enzymic processes. Nicotinic acid obviously owes its vitamin activity to the fact that the nucleotide of its amide, in combination with adenylic acid, ribose and phosphate, gives the dinucleotides, cozymase I and II, which are of great importance in biological reduction-oxidation reactions. The phosphate of the aldehyde, pyridoxal, which is the aldehyde corresponding to the primary alcohol, pyridoxine, has been proved to be the coenzyme required for the decarboxylation of *L*-amino acids. It is also concerned with transamination in bacteria and animal tissues and it probably has other functions in the metabolism of amino acids. Pantothenic acid is a coenzyme concerned in biological acetylations. Biotin is concerned with decarboxylation and carbon dioxide fixation reactions.

There has been a series of interesting papers proving the synthesis of B vitamins by the microflora of the gut. It is now established that this source of B vitamins is of very great importance in nutrition. In ruminants synthesis of all factors of the vitamin B complex occurs in the rumen and these factors are absorbed by the animal. Non-ruminants are less fortunate, since the microflora are concentrated in the lower part of the gastrointestinal tract and absorption of the synthesised B vitamins is therefore less certain. Non-ruminating animals and human beings, however, do absorb a fair amount of B vitamins produced by the microflora in their gastrointestinal tracts and, because of this, they may be independent of a dietary source of individual factors.

There are factors other than intestinal flora which affect dietary requirements of B vitamins. For example, the requirement of aneurine is closely linked with the dietary intake of carbohydrate; similarly that for pyridoxine is linked with the dietary intake of protein. This is scarcely surprising, since aneurine is concerned with carbohydrate metabolism and pyridoxine with protein metabolism. The nature of the diet probably also has an indirect effect on vitamin requirements because of its effect on the microflora. Thus it has long been recognised that milk is of great value in the treatment of pellagra, in spite of the fact that milk contains only negligible amounts of nicotinic acid. The theory has been advanced that the value of milk is due to the fact that it promotes nicotinic acid synthesis in the gut. This may be true, but the recent discovery that tryptophan can replace nicotinic acid in the diet suggests an alternative theory. It is most likely that milk owes its value both to the fact that it promotes bacterial synthesis in the gut and that it supplies additional tryptophan for conversion to nicotinic acid.

Antivitamins have come into prominence during recent years. There are several occurring naturally, the best known being avidin; this is present in raw egg-white and inactivates biotin, with which it combines in stoichiometric amounts. Bracken contains an anti-aneurine. Synthetic antivitamins are, indeed, well established. Various analogues of nicotinic acid have anti-nicotinic acid effects and, generally speaking, the analogues of other B vitamins behave similarly.

Folic acid, the most recently characterised member of the vitamin B complex, has proved to be a most interesting factor, not only because of its chemical constitution (it contains a pteridin residue combined with *p*-aminobenzoic acid and glutamic acid), but also because of its striking effect on patients suffering from various types of macrocytic anaemia. This factor produces a marked response in pernicious anaemia, in the macrocytic anaemia of sprue and in tropical and other nutritional macrocytic anaemias. Unfortunately, however, folic acid does not appear to prevent the development of neurological lesions in subjects suffering from pernicious anaemia. Of great interest at the moment is the relationship between folic acid and the anti-pernicious anaemia factor. It is quite certain that this factor is not identical with folic acid, since the most active preparations of the former are more potent than pure folic acid. With the anti-pernicious anaemia factor a good haematological response has been obtained from a single injection of about 1 mg. of solids. At least ten times this amount of folic acid would be required for a similar response. The elucidation of the aetiology of these various macrocytic anaemias presents an important problem that would appear to be approaching solution.

FUME PROBLEMS AND SULPHURIC ACID MANUFACTURE

By STANLEY ROBSON, M.Sc., D.I.C., F.R.I.C.

[Tees-side Section, 11 December, 1947]

It is only in comparatively recent years that the sulphurous fumes from smelting operations have been used for the manufacture of sulphuric acid. As late as the middle of the last century little attempt was made to restrain any fume emission. Percy in 1861 writes that "Swansea smelters enjoy the privilege of pouring dense volumes of thick sulphurous and arsenical smoke from comparatively low chimneys into the atmosphere and destroy vegetation with impunity for a considerable distance around. This privilege has now in the lapse of time become an established right which would not readily be conceded in many other parts of the Kingdom. The inhabitants of Swansea generally seem to be habituated to the inhalation of the smoke and to submit to the evil—if evil it be regarded—with unmurmuring resignation." Whatever the position might have been when those words were written it no longer holds, either in Swansea or in any other part of the world, except perhaps in deserts and waste spaces. On the contrary, the reaction of all concerned to the evils of unrestrained emission of smoke has in the course of time been profound and has exerted a considerable influence, not only on the method of smelting, but also on the distribution of basic chemical products, such as fertilisers.

The smelting of sulphide ores of copper, lead, zinc and nickel, to mention the more common, is accompanied by the release of great quantities of sulphurous fume. In general in European countries these fumes are transformed into sulphuric acid and the total amount produced is considerable. In England, which produces relatively little metal, the amount produced from zinc smelting operations is over 500 tons of sulphuric acid per day. On the American Continent large tonnages are similarly produced, but very large volumes of sulphurous fumes are still released uncondensed into the atmosphere. In several cases in the United States this may amount to the equivalent of over 600 tons of sulphuric acid per day, while in one smelter in Canada the equivalent is as much as 5,000 tons per day. Where the atmosphere is dry and the district not highly populated or farmed the fume may be released through very high stacks without serious nuisance, but cases where this can occur with impunity are steadily diminishing, and the amount of sulphuric acid which must be made from smelter fumes grows correspondingly and is to-day an important factor in the world's production.

The first attempt at making sulphuric acid from smelter fume was by means of the sulphuric acid chamber process, which was used mainly on the European Continent. For this to be successful several problems had to be overcome, as the roasting furnaces evolved a gas of low SO_3 concentration which contained much dust and was frequently contaminated with fluorine. The problems of concentrating the fume and restraining the dust were gradually overcome, but the problem of fluorine in hot gases, which leads to a very rapid attack on the silica packing of the washing towers, was never satisfactorily solved.

The revival of smelting in South Wales and South-West England in recent years inevitably led to the production of large quantities of acid, which perforce had to be transformed into a grade of acid that could be consumed by the great tinplate industries of the area. As for this purpose even traces of arsenic were injurious, it was necessary that a very high grade of sulphuric acid should be produced before this market could be entered. The only means by which this could be done economically was by removing the impurities from the gas itself prior to acid making. The first attempts in this country to make pure sulphuric acid from these gases were by using a process of manufacture known as the Schmiedel process. This was not successful, however, owing to an exceptional loss of nitric oxide through reduction of the nitrosulphonic acid by sulphur dioxide dissolved in the circulating acid. Attention had to be turned, therefore, to the use of the contact acid method. Various forms of this process include the Badische and Tentelew systems, and its development has involved the use of electrostatic means of purification and the application of vanadium masses in this country as well as abroad.

Plants erected in this country, or in course of erection to the designs of British chemical engineers, are equal to the largest erected anywhere, and contact masses have been developed and are in use giving regular recoveries at the converter of 98 per cent.

At the beginning of the first World War the normal acid unit contained two 10-ton converters in parallel. The sole remaining plant built at that time now has 25-ton converters, while latest plants have a capacity of 50 to 60 tons and others of larger capacity are in course of erection.

The contact system presented one of the earliest, if not the earliest, chemical engineering problem in the chemical industry and calls for much greater complication of plant than the chamber process. Twenty years ago few people agreed with the

author that in a relatively few years as much sulphuric acid would be made by the contact system as by the chamber system. To-day in many regions this has now been effected and few would expect any modern plant to be erected on any other system. It is by the help of these developments that fume from smelting works has been practically eliminated and the residual SO_2 in the oxide gases of smelters reduced to minor dimensions in this country.

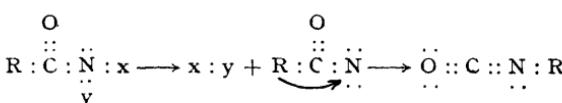
INTRAMOLECULAR TRANSFORMATIONS

By A. K. MILLS, B.Sc., Ph.D.

[Dublin and District Section, 10 December, 1947]

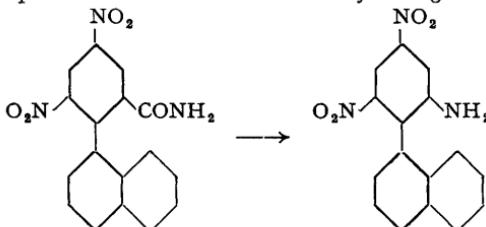
Reactions involving intramolecular transformations have been known since the earliest days of organic chemistry and many theories have been put forward in an attempt to supply a mechanism for these reactions suitable to prevalent ideas. Some investigations such as those of Meisenheimer on the Beckmann re-arrangement have helped greatly towards a further understanding of these reactions. Stereochemical investigations in particular may be useful in elucidating the mechanism of these re-arrangements.

It has only recently been realised that all intramolecular transformations are probably very similar in mechanism and, as suggested by Meerwein, involve ionisation. The general scheme put forward by Whitmore for the Curtius, Lossen, Hofmann and Beckmann re-arrangements is a simple one:



and very similar mechanisms can be put forward for other reactions such as pinacol-pinacolin transformation, semi-pinacolinic deamination, Wagner re-arrangement, Wolff re-arrangement and so on. Each of these re-arrangements depends on the preliminary formation of a carbonium ion or nitrogen sextet and stability is re-established by the migration of a radical complete with its shared electrons. This formation of a carbonium ion and migration of a radical complete with shared electrons enables a parallel to be drawn with the S_N1 and S_N2 substitution reaction mechanisms of Ingold.

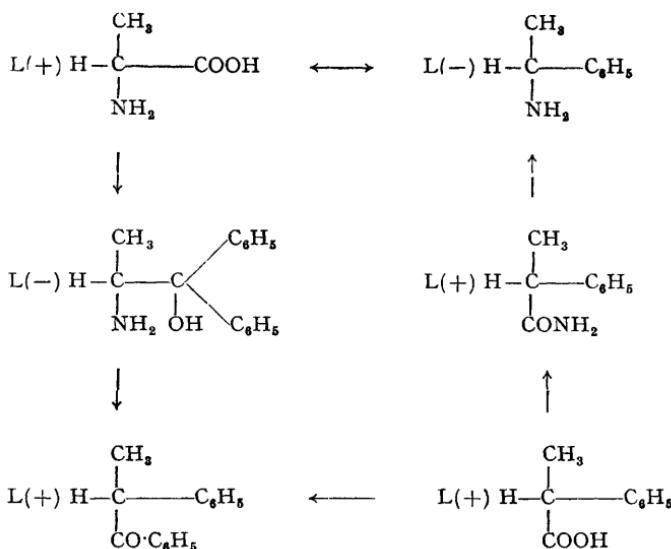
The discovery by McKenzie that optical activity could be retained, without any signs of racemisation, during the re-arrangement of semi-pinacolinic deamination proved an important clue in the study of these mechanisms and examples of retention of activity during the Curtius, Hofmann and some pinacolinic and other re-arrangements soon followed. It should be noted, however, that, whereas semi-pinacolinic deamination appears to require the retention of optical activity at a carbonium ion, the Hofmann and Curtius re-arrangements would involve the retention of optical activity of a migrating carbanion. In particular the retention of activity during the Hofmann re-arrangement



(Wallis and Moyer)

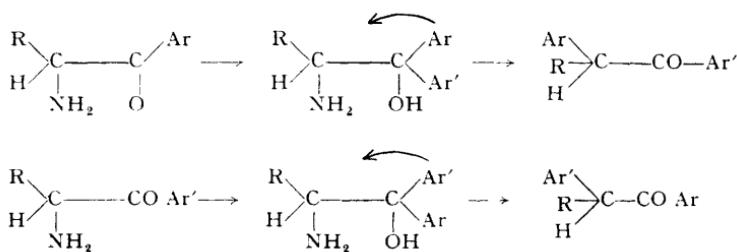
demonstrates the speed with which the migration must take place and would seem to indicate that the carbon atom in the ortho-position in the benzene ring is never really free and certainly not long enough to enable the molecule to become planar.

Is there any Walden inversion at either the migrating carbanion or the carbonium ion during re-arrangement? The work of Noyes and others on the Hofmann re-arrangement of the camphoramic acids and other similar re-arrangements has produced strong evidence for the retention of configuration of the radical during migration from carbon to nitrogen. In the study of a considerable number of semi-pinacolinic deaminations it was shown that the migrating group always took up the same corresponding position after migration. If the assumption is made that all Hofmann transformations involve the retention of configuration of the radical during migration, then in the following example it becomes evident that during semi-pinacolinic deamination the migrating group approaches the carbon atom from the opposite side to that occupied by the group that has been removed.



That there is a Walden inversion at the carbon atom towards which the migration takes place has not been demonstrated previously and is of considerable interest, for such a mechanism obviously enables the migration to occur much more quickly and indeed the migration could take place at the same time as the removal of the NH_2 group (or residue thereof) and not necessarily as a second stage. That radicals retain configuration during migration from carbon to carbon has been confirmed by the conversion of $(+)$ α -phenylethyl methyl ketone to $(-)$ β -phenylpropyl methyl ketone by the Meerwein re-arrangement with diazomethane.

The conversion of symmetrical pinacols to ketones has been much used to measure the so-called "migrational aptitude" of organic radicals. Starting from amino-ketones it is a simple matter to prepare the two diastereoisomeric forms of amino-alcohols. It has been found in the following instances, particularly where R = benzyl, that Ar or Ar' migrates according to which of the two diastereoisomeric amino-alcohols is deaminated.



Evidently here the tendency to migrate depends entirely on the stereochemical position of the groups in the molecule.

RECENT DEVELOPMENTS IN PARTITION CHROMATOGRAPHY ON PAPER

By R. R. GOODALL, Ph.D.

[Huddersfield Section, 6 January, 1948]

The technique of partition chromatography differs from the more familiar adsorption chromatogram (e.g. on alumina columns) in that it is based on the differential partition of two or more solutes between a stationary aqueous phase, held on a porous support (e.g. silica gel), and a flowing solvent phase only slightly miscible with the stationary phase.

Since its inception, partition chromatography on silica gel and on filter paper has been recognised as a valuable new analytical weapon. Already the scope of the method,

originally devised for the analysis of amino-acids in protein hydrolysates, has been greatly extended by other workers in many recent publications, particularly on the applications of the paper chromatogram, which is a relatively simple micro-technique.

One- and two-dimensional paper chromatographic techniques were originally reported by Consden, Gordon and Martin (*Biochem. J.*, 1944, **38**, 224) and an appraisal of these new techniques for qualitative and quantitative analyses can be made from consideration of the following examples.

The identification and rough estimation of the individual amounts of amino-acids present in certain pathological urines (amino-aciduria in Fanconi syndrome) was accomplished by C. E. Dent, using only five drops of the specimen, it having been shown that the normal constituents of urine did not interfere with the analysis for amino-acids.

Dent, Stepká and Steward, in a recent communication to *Nature*, have produced evidence, derived from the chromatographic identification of 21 amino-acids in the alcoholic extract from potato cells, to favour the glutamine \rightleftharpoons glutamic acid hypothesis of biosynthesis in plant cells.

Working on the qualitative and approximately quantitative analysis of the active constituents in penicillin on a paper strip impregnated with phosphate buffer, it was found by Goodall and Levi that as little as 1 microgram of each active constituent could be readily determined by placing the chromatographically developed strip in contact with a uniform sheet of nutrient agar pre-inoculated with *B. subtilis*. The resulting elliptical areas free from bacterial growth were compared against standards of penicillin II. The technique was unique in giving a complete analysis of all the several penicillins in admixture and has revealed the presence of small amounts of novel penicillins.

The work of Partridge on the qualitative identification of reducing sugars has been extended to quantitative analysis by Flood, Hirst and Jones, who showed that the estimation of reducing sugars in natural gums and the determination of end-groups was now possible without encountering the severe analytical difficulties associated with earlier methods.

The chromatographic separation of dyestuffs such as crystal violet and methylene blue and the highly-fluorescent antimalarial mepacrine from a chloro-analogue could readily be demonstrated on a paper strip impregnated with pH 7 buffer. The latter separation could not be effected by adsorption chromatography on alumina columns.

ELECTROSTATIC HAZARDS IN CHEMICAL INDUSTRY

By E. G. Cox, D.Sc., F.Inst.P., F.R.I.C.

[Leeds Area Section, 12 January, 1948]

Electrification occurs in a wide variety of industrial processes and occasionally constitutes a hazard of some magnitude owing to the possibility of fires or explosions resulting from sparks. At other times it may be an inconvenience, e.g. in preventing the free running of a product or in causing sheets of material to adhere to machinery. In occupations of hazardous nature, even when electrification is not serious from the point of view of fire risk, the occasional occurrence of sparks may have a bad psychological effect on workers.

When two dissimilar surfaces (not both good conductors) are separated, they are electrified, one positively and the other to an equal extent negatively: the quantity of electricity produced depends upon the area of contact and upon the nature of the surfaces and of the medium (in practice usually air) in which they are separated. (It is important to observe that friction is only effective in producing electrification in so far as it increases the area of contact or modifies the surfaces, e.g. by heating them). Thus electrification may occur in such processes as mixing, grinding, sieving; movement of material over conveyors and through chutes; flow and splashing of liquids; movement of insulated workpeople and vehicles, and so on.

Static electricity produced in these various ways usually only becomes potentially dangerous if it accumulates on insulated conductors, e.g. a section of a chute which is not earthed or a workman wearing insulating footwear or standing on a non-conducting floor. The voltage and the electrical energy which such an insulated conductor acquires then depend upon (a) the rate at which electricity is being produced, (b) the rate at which it is leaking away on account of imperfect insulation, (c) the size of the conductor (which determines its electrical capacity). In practice voltages of some thousands are relatively common and occasionally as much as 15,000 volts is recorded. For a given capacity the energy of a charged conductor depends upon the square of the voltage; for example, the electrostatic energy of a man charged to 1,000 volts is about 1,500 ergs, while if his potential is 5,000 volts his energy is about 40,000 ergs (0.004 joule).

The magnitude of the hazards arising from electrification, and therefore the importance of protective measures, depend chiefly upon the susceptibility of the materials

handled to ignition by electric sparks. Inflammable materials may be in the form of vapour-air mixtures or dust clouds; the risk of igniting solid or liquid substances in bulk is negligible (save possibly with a few exceptional substances such as very sensitive initiating explosives). It is now fairly well established that a spark of more than a definite minimum *energy* is required to ignite any particular vapour-air mixture or dust cloud and this minimum can be determined by laboratory experiments. Recent work has shown, however, that the character of the spark may be of great importance: for example, a starch dust-cloud cannot be ignited by the direct spark discharge of a condenser with an energy of 100 joules, whereas if suitable resistance is put in series with the spark gap a spark of only 0·2 joule energy suffices to ignite the cloud. In other instances, e.g. magnesium dust clouds, the character of the spark is of less importance, and the minimum energy for ignition (about 0·01 joule) depends much less on the conditions under which the discharge occurs. The implications, both theoretical and practical, of results of this kind are of the greatest interest and importance; it is clear from a practical point of view that hazards can only be properly assessed after a quantitative study of the most favourable conditions for ignition.

When there are good grounds for supposing that an electrostatic hazard exists, steps must be taken to eliminate it. While each problem must be examined on its merits, the following protective measures cover most cases:—(a) earthing, (b) humidification, (c) ionisation of the air, (d) elimination of non-conducting material.

The complete earthing of all conducting objects would in very many cases remove all possibility of electrostatic risks, but such a procedure is often impracticable, as for example when conductors (including workpeople) are moving. Humidification is sometimes appropriate, but 80 per cent. humidity may be necessary to prevent electrification and so high a humidity may be objectionable for other reasons. Ionisation can be achieved by a variety of agencies, but is usually effective only over comparatively short distances and therefore may be inapplicable (or too costly) for large-scale requirements.

Sometimes freedom from electrification can be achieved by replacing insulating materials with a conducting composition, such as conducting rubber, asphalt, and so on.

BOOKS AND THEIR CONTENTS

Forensic Chemistry (Second Edition, revised). H. T. F. Rhodes. Pp. vii + 164. (London: Chapman & Hall, Ltd., 1946.) 15s. net.

(For contents of First Edition, see JOURNAL AND PROCEEDINGS, 1940, IV, 277.)

Boiler Feed Water (Fourth Edition, revised). Percy G. Jackson. Pp. xii + 132. (London: Charles Griffin & Co., Ltd., 1947.) 8s. 6d. net.

Introductory. Mineral constituents; corrosion; softening; selection of softening plants; priming; scale, grease and overheating; prevention of scale and caustic embrittlement; boiler control; methods of analysis; analysis of scale; control tests for water softening; sampling; solutions. Appendix: factors for radical equivalents; Clark's table of hardnesses; formulae for calculating maximum concentration, etc.; table of capacities of horizontal cylinders; list of atomic weights. Index.

A Pocket Book for Chemists (Tenth Edition). T. Bayley; edited by F. G. Angell. Pp. xv + 508. (London: E. & F. Spon, Ltd., 1948.) 30s. net.

Preface. Seven Sections: Mathematical; Weights and Measures; Physical; General Analysis; Gravimetric Analysis; Volumetric Analysis; Miscellaneous. Index.

REMUNERATION STATISTICS

In October, 1947, a letter and card were sent to all Fellows and Associates, asking them to indicate, by marking \times in the appropriate space, their age and total remuneration. This total was to include any regular bonus or share in profits (other than dividends on investments) and a sum roughly equivalent to the value of any free quarters or allowances (other than for expenses) that might be received. Contributions made by Members under superannuation schemes were not to be deducted, nor were additions to be made of contributions paid by employers under such schemes. The hope was expressed that Members who had reached positions of high responsibility as directors or managers, and who might be doubtful as to whether their remuneration was to be regarded as derived from "the practice of the profession of chemistry," would not hesitate to make the return, for the information was particularly desired as furnishing an indication of the prospects that the profession has to offer to young entrants.

Members were also asked to mark \times in one or more of the squares indicating the general nature of their occupation. Those who had effectively retired from full-time work were asked not to put \times in the main table (representing income from pension or from part-time work) without also putting one in the square marked "retired."

The numbers of cards sent out and returned are shown in the following table.

		HOME (Great Britain and Northern Ireland)	OVERSEAS (including Eire)	TOTAL
Fellows	Sent .. .	3,097	456	3,553
	Returned .. .	2,673	283	2,956
	Per cent. .. .	86·4	62·1	83·2
Associates	Sent .. .	6,117	821	6,938
	Returned .. .	5,358	497	5,855
	Per cent. .. .	87·6	60·5	84·4
Total	Sent .. .	9,214	1,277	10,491
	Returned .. .	8,031	780	8,811
	Per cent. .. .	87·2	61·1	84·0

The sorting of returns into "Home" and "Overseas" depended on stamps and postmarks. A few members normally employed at home may have posted their cards while travelling abroad and vice versa, but the accuracy of the statistics will not be materially affected thereby.

The Council desires to express its appreciation of the very satisfactory response made by Members to this request.

Table I shows Fellows and Associates together, the figure in each square being the total number of crosses placed in that square. Tables 2 and 3 show Fellows and Associates separately. Totals and percentages in each age group and in each remuneration group are given.

In the last column the average remuneration in each age group is stated. Group A, under £400 per annum, has been calculated as £350. In groups B-Q the mid-point of each group has been taken (e.g. Group F, £600-£699, has been taken as £650). In Group R (over £2,500 per annum), in which members were asked to state a figure, not all did so: where a figure was given it has been used in the calculation; where no figure was given, the minimum of the group, £2,500, has been used. It will be appreciated that the results do not represent true averages, but experience in the use of previous returns has shown that the figures are useful for comparative purposes. No average remuneration has been shown where the number in the group is relatively small.

In all the remuneration tables it should be noted that Groups B to E cover a range of £50, Groups F to J, £100 and Groups K to P, £200. Group Q covers a range of £500.

Table 4 shows, for Fellows and Associates together, the number in each remuneration group in each class of occupation.

It was necessary to restrict the number of classes of occupation and squares were provided on the cards for the following: industry, government, local authority, university or technical college, school, employer (on own account) and private practice. In consequence some members found difficulty in deciding in which class they fell and indicated their position by placing \times in two or more squares or by adding another class of occupation. Where two or more crosses were used, an attempt was made to select the more informative in tabulating the results. For example "industry" and "government" were recorded as "industry"; "local authority" and "school" as "school"; "employer" and "private practice" as "private practice." Members whose occupation did not fall within one of the above classes—including about 70 who stated that they were post-graduate students or in receipt of a research or training grant and 117 who did not give their occupation—have been grouped together under "Miscellaneous."

Tables 5-7 show, for Fellows and Associates together and separately, the age and remuneration distribution of Members employed in Industry.

Table 8 gives a comparison between the present returns and the results of the similar enquiry in 1942. It should be noted that in 1942 the lowest remuneration group was "under £250" and the highest "over £1,600."

The cards provided squares for members to state if they were serving in the Forces, effectively retired or unemployed. Footnotes to Tables 1-3 show the returns. These figures have not been included in the tabulations.

Only 28 members returned cards with insufficient information for classification. They are included in the footnotes. Five blank cards were returned and 2 in respect of deceased members: these have not been included. Fifty-nine cards were received too late to be considered: the list was closed on 23 January, 1948.

TABLE I
FELLOWS AND ASSOCIATES: AGE/REMUNERATION

Age	Age										Remuneration			Average remuneration £450					
	Under 400	400 to 449	450 to 499	500 to 549	550 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1199	1200 to 1399	1400 to 1599	1600 to 2000	1800 to 2500	Total	Per cent.			
21—25	194	156	135	78	30	22	4	2	—	3	—	2	—	—	626	7.5			
26—30	81	124	167	210	174	224	76	34	12	8	6	3	1	1	—	1121	13.5	569	
31—35	40	49	115	176	147	393	249	184	95	114	43	26	6	4	9	4	1654	19.9	745
36—40	23	9	31	79	87	210	201	154	106	133	71	39	30	6	31	8	1218	14.7	895
41—45	18	18	29	32	59	163	154	165	123	191	123	76	44	22	39	45	1301	15.6	1069
46—50	14	5	13	21	38	116	115	111	89	149	100	78	43	25	58	56	1031	12.4	1217
51—55	3	4	6	16	21	56	63	63	56	83	60	47	26	15	29	59	607	7.3	1316
56—60	3	—	1	9	15	37	38	31	32	71	43	42	25	12	37	55	451	5.4	1458
61—65	1	1	2	4	5	17	19	19	11	27	16	25	7	15	19	21	209	2.5	1566
Over 65	5	2	2	5	3	7	4	5	6	7	12	6	4	5	14	14	101	1.2	—
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R			
Total	382	398	501	630	579	1245	923	768	530	786	474	344	186	105	236	262	8319	Average: £942	
Per cent.	4.6	4.4	6.0	7.6	7.0	15.0	11.1	9.2	6.4	9.5	5.7	4.1	2.2	1.3	2.8	3.1	100.0		

Retired, 396. Serving in Forces, 18.
Unemployed, 50. Unclassifiable, 28.
Total, 492. Grand Total, 8,811.

TABLE 2
FELLOWS: AGE/REMUNERATION

Age	£												Average remuneration				
	Under £400	400 to 449	450 to 499	500 to 549	550 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1199	1200 to 1399	1400 to 1599	1600 to 1799	1800 to 1999	2000 to 2500	Total	Per cent.
21—25	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	0·1	
26—30	2	1	3	5	6	16	3	5	—	1	1	—	—	—	—	43	1·7
31—35	2	2	3	11	12	54	45	47	30	28	16	9	1	—	3	1	867
36—40	2	—	2	5	17	34	58	56	36	58	42	22	17	2	18	4	373
41—45	1	—	4	8	12	40	59	76	50	94	72	54	26	14	24	33	567
46—50	2	—	2	5	12	27	45	51	43	78	66	41	32	14	36	37	491
51—55	2	2	1	3	7	22	30	28	33	50	41	33	18	9	20	43	342
56—60	1	—	—	4	8	15	19	20	20	40	26	32	20	9	28	48	290
61—65	—	—	1	2	1	8	11	13	6	22	13	20	7	12	17	16	149
Over 65	4	1	2	4	2	7	2	5	6	6	10	5	4	4	14	12	88
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R		
Total	16	7	18	47	77	223	272	301	224	376	287	217	125	64	160	194	2608
Per cent.	0·6	0·3	0·7	1·8	3·0	8·6	10·4	11·5	8·6	14·4	11·0	8·3	4·8	2·5	6·1	7·4	100·0

Retired, 322. Serving in Forces, 4.
Unemployed, 12. Unclassifiable, 10.
Total, 348. Grand Total, 2,956.

TABLE 3
ASSOCIATES: AGE/REMUNERATION

Age	£										Average remuneration							
	Under 400	400 to 449	450 to 499	500 to 549	550 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1199	1200 to 1399	1400 to 1599	1600 to 1799	1800 to 1999	2000 to 2500	Over 2500	Total	Per cent.
21—25	194	155	135	78	30	22	4	2	—	3	—	2	—	—	—	—	625	10.9
26—30	79	123	164	205	168	208	73	29	12	8	5	2	1	1	—	—	1078	18.9
31—35	38	47	112	165	135	339	204	137	65	86	27	17	5	4	6	3	1390	24.3
36—40	21	9	29	74	70	176	143	98	70	75	29	17	13	4	13	4	845	14.8
41—45	17	18	25	24	47	123	95	89	73	97	51	22	18	8	15	12	734	12.9
46—50	12	5	11	16	26	89	70	60	46	71	34	37	11	11	22	19	540	9.5
51—55	1	2	5	13	14	34	33	35	23	33	19	14	8	6	9	16	265	4.6
56—60	2	—	1	5	7	22	19	11	12	31	17	10	5	3	9	7	161	2.8
61—65	1	1	1	2	4	9	8	6	5	5	3	5	—	3	2	5	60	1.1
Over 65	1	1	—	1	1	—	2	—	—	1	2	1	—	1	—	2	13	0.2
Total	366	361	483	583	502	1022	651	467	306	410	187	127	61	41	76	68	5711	Average: £775
Percent.	6.4	6.3	8.4	10.2	8.8	17.9	11.4	8.2	5.4	7.2	3.3	2.2	1.1	0.7	1.3	1.2	100.0	

Retired, 74. Serving in Forces, 14.
Unemployed, 38. Unclassifiable, 18.
Total, 144. Grand Total, 5,855.

TABLE 4
FELLOWS AND ASSOCIATES: OCCUPATION/REMUNERATION

Occupation	Under £400	400	450	500	550	600	700	800	900	1000	1200	1400	1600	1800	2000	Over 2500	Total 2500	Per cent.
		to 449	to 499	to 549	to 599	to 699	to 799	to 899	to 999	to 1199	to 1399	to 1599	to 1799	to 1999	to 2500			
Industry ..	113	217	295	412	380	742	578	455	337	504	298	210	126	73	165	175	5080	61.1
Government ..	56	38	63	80	55	152	132	136	98	99	81	39	15	4	13	3	1064	12.8
Local Authority ..	8	13	21	19	17	44	31	27	19	22	8	6	2	—	1	—	238	2.8
University or Technical College ..	111	55	68	47	43	134	95	101	39	77	39	43	23	12	7	2	896	10.8
School ..	17	32	33	47	60	129	57	21	17	14	4	2	—	—	—	—	433	5.2
Employer ..	5	—	4	4	2	4	4	3	3	22	7	16	5	4	20	32	135	1.6
Private Practice ..	11	7	4	7	6	13	8	11	9	23	25	16	10	7	24	41	222	2.7
Miscellaneous ..	61	6	13	14	16	27	18	14	8	25	12	12	5	5	6	9	251	3.0
Total ..	382	368	501	630	579	1245	923	768	530	786	474	344	186	105	236	262	8319	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R		
Per cent. ..	4.6	4.4	6.0	7.6	7.0	15.0	11.1	9.2	6.4	9.5	5.7	4.1	2.2	1.3	2.8	3.1	100.0	

TABLE 5
FELLOWS AND ASSOCIATES: AGE/REMUNERATION IN INDUSTRY

Age	Under £400				£400 to £499				£499 to £599				£599 to £899				£899 to £1199				£1199 to £1399				£1399 to £1599				£1599 to £1999				Average remuneration	
	400	450	500	550	600	650	700	800	900	950	1000	1200	1400	1600	1800	1900	2000	2500	Total	Per Cent.	£	%												
21—25	70	114	93	62	23	17	3	—	—	1	—	2	—	—	—	—	—	—	385	7·6	468	—												
26—30	21	61	106	152	148	177	56	29	10	8	5	2	1	1	—	—	—	—	777	15·3	594	—												
31—35	9	20	59	107	94	268	181	143	74	94	31	21	3	4	5	3	3	1116	22·0	778	—													
36—40	4	3	11	44	44	113	125	104	80	92	48	25	20	5	23	4	23	4	745	14·7	933	—												
41—45	3	11	14	21	34	65	81	98	85	127	82	52	35	14	28	35	35	785	15·4	1138	—													
46—50	2	1	9	10	19	56	65	46	44	89	72	52	30	19	45	39	39	598	11·8	1307	—													
51—55	—	4	1	9	9	21	41	25	20	45	32	24	17	10	19	39	39	316	6·2	1452	—													
56—60	3	—	3	6	17	16	6	16	34	18	17	15	8	27	35	35	221	4·3	1605	—														
61—65	1	1	1	1	2	7	8	3	5	9	6	12	2	10	10	9	9	87	1·7	—	—													
Over 65	—	2	1	3	1	1	2	1	3	5	4	3	3	2	8	11	50	1·0	—	—	—													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R																		
Total	113	217	295	412	380	742	578	455	337	504	298	210	126	73	165	175	5080	Average: £970																
Percent.	2·2	4·3	5·8	8·1	7·5	14·6	11·4	9·0	6·6	9·9	5·9	4·1	2·5	1·4	3·3	3·4	3·4	100·0																

TABLE 6
FELLOWS: AGE/REMUNERATION IN INDUSTRY

Age	Age										Remuneration			Average Remuneration £						
	Under 400	400 to 449	450 to 499	500 to 549	550 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1199	1200 to 1399	1400 to 1599	1600 to 1799	1800 to 1999	2000 to 2500	Total	Per cent.			
21—25	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	0·1	—		
26—30	—	—	2	4	5	9	2	4	—	—	1	—	—	—	—	—	27	1·9	—	
31—35	—	2	3	5	6	30	27	37	25	23	13	6	1	—	2	—	180	12·5	893	
36—40	—	—	1	3	12	12	35	30	24	36	27	11	11	2	12	1	217	15·0	1081	
41—45	—	—	2	6	4	15	32	40	31	59	44	32	21	7	14	24	331	22·9	1303	
46—50	—	—	2	2	9	16	25	19	18	37	44	23	19	11	26	25	276	19·1	1431	
51—55	—	—	2	1	—	4	12	18	9	10	24	17	14	9	6	13	30	169	11·7	1672
56—60	1	—	—	1	3	8	8	6	9	16	9	14	12	6	20	31	144	10·0	1721	
61—65	—	—	—	—	1	3	4	2	2	7	6	10	2	7	8	6	58	4·0	1701	
Over 65	—	1	1	3	—	1	1	1	3	4	3	2	3	1	8	9	41	2·8	2070	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R				
Total	1	6	12	24	44	106	152	148	122	206	164	112	78	40	103	126	1444	Average: £1353		
Per cent.	0·1	0·4	0·8	1·7	3·0	7·3	10·5	10·2	8·5	14·3	11·4	7·8	5·4	2·8	7·1	8·7	100·0			

TABLE 7
ASSOCIATES' AGE/REMUNERATION IN INDUSTRY

Age	Average Remuneration										Total	Percent.							
	Under £400	£400 to 449	£450 to 499	£500 to 549	£550 to 599	£600 to 699	£700 to 799	£800 to 899	£900 to 999	£1,000 to 1,199	£1,200 to 1,399	£1,400 to 1,599	£1,600 to 1,799	£1,800 to 1,999	£2,000 to 2,500	Total	Percent.		
21—25	70	113	93	62	23	17	3	—	1	—	2	—	—	—	384	10·6			
26—30	21	61	104	148	143	168	54	25	10	8	4	2	1	1	750	20·6			
31—35	9	18	56	102	88	238	154	106	49	71	18	15	2	4	936	25·8			
36—40	4	3	10	41	32	101	90	74	56	56	21	14	9	3	528	14·5			
41—45	3	11	12	15	30	50	49	58	54	68	38	20	14	7	14	454	12·5		
46—50	2	1	7	8	10	40	40	27	26	52	28	29	11	8	19	14	322	8·9	
51—55	—	2	—	9	5	9	23	16	10	21	15	10	8	4	6	9	147	4·0	
56—60	2	—	—	2	3	9	8	—	7	18	9	3	3	2	7	4	77	2·1	
61—65	1	1	1	1	4	4	1	3	2	—	2	—	3	2	3	29	0·8	—	
Over 65	—	1	—	—	1	—	—	1	—	1	—	1	—	1	—	2	9	0·2	—
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R			
Total	112	211	283	388	336	636	426	307	215	298	134	98	48	33	62	49	3636	Average: £818	
Percent.	3·1	5·8	7·8	10·7	9·2	17·5	11·7	8·5	5·9	8·2	3·7	2·7	1·3	0·9	1·7	1·3	100·0		

TABLE 8
COMPARISON, 1942/1947

	1942			FELLOWS			1947		
	No.	Per cent.		No.	Per cent.		No.	Per cent.	Per cent.
Under £400	60	4·8		16	0·6				
400—499	117	9·3	}	25	1·0	}	Under £500		1·6
500—599	175	13·9		124	4·8				
600—699	162	12·8		223	8·6				
700—799	134	10·6	{	500—999	52·1		10·4	500—999	43·9
800—899	102	8·1		301	11·5				
900—999	85	6·7		224	8·6				
1000—1199	155	12·3		376	14·4				
1200—1399	76	6·0	{	287	11·0		1000—1599		33·7
1400—1599	48	3·8		217	8·3				
1600 and over	147	11·7	1600 and over	11·7	543	20·8	1600 and over	20·8	
Total ..	1261	100·0		2608	100·0				100·0
ASSOCIATES									
	No.	Per cent.		No.	Per cent.		No.	Per cent.	Per cent.
Under £400	1167	31·6		366	6·4				
400—499	877	23·8	}	844	14·7	}	Under £500		21·1
500—599	573	15·6		1085	19·0				
600—699	358	9·7		1022	17·9				
700—799	218	5·9	{	500—999	37·3		11·4	500—999	61·9
800—899	140	3·8		467	8·2				
900—999	86	2·3		306	5·4				
1000—1199	116	3·1		410	7·2				
1200—1399	50	1·4	{	187	3·3		1000—1599		12·7
1400—1599	22	0·6		127	2·2				
1600 and over	80	2·2	1600 and over	2·2	246	4·3	1600 and over	4·3	
Total ..	3687	100·0		5711	100·0				100·0
FELLOWS AND ASSOCIATES									
	No.	Per cent.		No.	Per cent.		No.	Per cent.	Per cent.
Under £400	1227	24·8		382	4·6				
400—499	994	20·1	}	869	10·4	}	Under £500		15·0
500—599	748	15·1		1209	14·6				
600—699	520	10·5		1245	15·0				
700—799	352	7·1	{	500—999	41·1		11·1	500—999	56·3
800—899	242	4·9		768	9·2				
900—999	171	3·5		530	6·4				
1000—1199	271	5·5		786	9·5				
1200—1399	126	2·5	{	474	5·7		1000—1599		19·3
1400—1599	70	1·4		344	4·1				
1600 and over	227	4·6	1600 and over	4·6	789	9·4	1600 and over	9·4	
Total ..	4948	100·0		8319	100·0				100·0

NOTES

PERSONAL

Among recent awards made by the Government of the United States to British scientific workers, for their services during the War, are the following to Fellows of the Institute:

Medal of Freedom with Silver Palm: Sir Jack Drummond, F.R.S., scientific adviser to the British Ministry of Food, 1944-46; Sir Alfred Egerton, F.R.S., secretary of the Royal Society and member of the Scientific Advisory Committee to the War Cabinet.

Medal of Freedom with Bronze Palm: Sir Ian Heilbron, D.S.O., F.R.S., for scientific research and development in connection with chemical warfare munitions.

Sir Jack Drummond has also been appointed a Commander in the Order of Orange-Nassau (Civilian Division) in recognition of services rendered to the Netherlands during the War.

Dr. Ernest Harold Farmer, *Fellow*, Assistant Director and Senior Organic Chemist, British Rubber Producers' Research Association, has been elected a Fellow of the Royal Society in recognition of his experimental studies of complex unsaturated hydrocarbons and related natural products.

Professor C. N. Hinshelwood, *Fellow*, has been appointed Chairman of the National Committee for Chemistry, on the resignation of Sir Ian Heilbron, *Fellow*, who has been Chairman since 1943. The Committee has placed on record its deep appreciation of the very valuable services which Sir Ian has rendered to international chemistry.

Mr. T. H. McCombs, *Associate*, has been given the portfolios of Education and Scientific and Industrial Research in the New Zealand Cabinet.

Mr. W. A. Joiner, *Fellow*, has been appointed Deputy Secretary, Department of Scientific and Industrial Research, New Zealand.

Mr. F. J. T. Grigg, *Fellow*, succeeds Mr. Joiner as Dominion Analyst and Director of the Dominion Laboratories.

Mr. A. S. White, *Fellow*, who has been a member of the research staff of Imperial Chemical Industries, Ltd. (Dyestuffs Division) for 14 years, has been appointed Superintendent of the Chemical Engineering Division of the Atomic Energy Research Establishment at Harwell.

Mr. H. V. Potter, *Fellow*, has been appointed a Jubilee Memorial Lecturer for 1948 of the Society of Chemical Industry.

Mr. W. C. Peck, *Fellow*, has been appointed, by the Minister of Education, to the Board of Governors of the National College for Heating, Ventilating, Refrigeration and Fan Engineering.

Mr. H. Lewis, *Fellow*, has been appointed Director of Disposals in the Ministry of Supply.

Dr. R. L. Wain, *Fellow*, Head of the Department of Physical Sciences at Wye College, has had the title of Reader in Agricultural Chemistry in the University of London conferred upon him.

Dr. E. W. Fell, *Fellow*, has been appointed Senior Assistant in Metallurgy at the Bradford Technical College.

Mr. F. C. Price, *Associate*, has been appointed Deputy Chief Chemist to the Indian Jute Mills Research Association, Calcutta, and took up his duties in January.

Erratum.—In JOURNAL AND PROCEEDINGS, 1948, I, 25, under NOTES: PERSONAL, Dr. J. H. Skellon should have been described as "late Senior Assistant . . ." and not "Head Senior Assistant, Department of Chemistry, Chelsea Polytechnic."

BEILBY MEMORIAL AWARDS

The Administrators of the Sir George Beilby Memorial Fund, representing the Institute of Metals, the Royal Institute of Chemistry and the Society of Chemical

Industry, normally meet once a year to consider the making of awards from the interest derived from the invested capital of the Fund. These awards are made to British investigators in science as a mark of appreciation of distinguished work, particularly in such fields as fuel economy, chemical engineering and metallurgy in which Sir George Beilby's special interests lay. In general, the awards are not applicable to the more senior investigators but are granted as an encouragement to younger men who have done independent work of exceptional merit over a period of years.

Owing to the War no awards were made in respect of the years 1941-46 inclusive, but at a recent meeting of the Administrators it was decided to revert to normal practice and to make awards for 1947 to the following investigators —

Geoffrey Vincent Raynor, M A , D Phil , F R I C , F Inst P , for his researches on the constitution of alloy systems,

George Reginald Rigby, B Sc , Ph D , A R C S , D I C , A R I C , for his researches on refractory materials

HARRISON MEMORIAL PRIZE

The Harrison Memorial Prize Selection Committee, consisting of the Presidents of the Chemical Society, the Royal Institute of Chemistry, the Pharmaceutical Society and the Society of Chemical Industry, has awarded the Harrison Memorial Prize for 1947 to Derek Harold Richard Barton, B Sc , Ph D , A R C S , D I C , F R I C

MELDOLA MEDAL

The Council of the Institute, with the concurrence of the Society of Maccabaeans, has decided to award the Meldola Medal for 1947 to James Baddiley, M Sc , Ph D , in recognition of his outstanding contributions to fundamental knowledge, especially in relation to the nucleotides and co-enzymes

PROFESSOR FINDLAY'S MISSION

Since the previous note was published (*JOURNAL AND PROCEEDINGS*, 1948, I, 25), Professor Findlay has continued his tour of India and Pakistan and has forwarded detailed accounts of progress. From his letters it is clear that he has not only established contact with Indian and Pakistani chemists on the development of the science and profession of chemistry in the two Dominions but has established close personal relations with them and with university and industrial staffs throughout the sub-continent.

After attending the Annual General Meeting of the Indian Section and the Indian Science Congress at Patna at the beginning of January, Professor Findlay visited Benares, Allahabad (at the time of the Festival of Magh Mela), Agra and Delhi, where he was present at a prayer meeting of Mahatma Gandhi a week before the assassination. From Delhi he paid special visits to Lahore in Pakistan, via Amritsar, and to Dehra Dun and Mussoorie and then returned via Aligarh to Calcutta, whence he made special visits to the Tata Works and Laboratories at Jamshedpur and to Dacca in East Pakistan. His subsequent journeys took him to Hyderabad, via Nagpur, and to Madras, whence he paid a short visit to Annamalai. In his last letter he reports a journey to Trivandrum, the University of Tranvancore, and his arrival on 10 March at Bangalore, where he was met by Dr Fowler and had begun to talk to candidates taking the practical examination for the Associateship in that centre.

In most of the places visited Professor Findlay gave lectures and addressed chemists on the organisation of the profession. These talks have done much to stimulate interest among chemists and students and have already resulted in a request being made for the establishment of four separate Local Sections of the Institute in the Dominion of India, in place of the existing Indian Section, and to preliminary enquiries as to the possibility of forming an independent Local Section for Pakistan centred on Lahore (see p. 84).

Following attendance at the Associateship Examination in Bangalore, Professor Findlay intends to visit Mysore and then to take a few days of well earned rest in the hill station of Ootacamund. He expects to arrive in Bombay on 28 March and is due to sail from there to Durban on *S S Tairea* on or about 3 April with a view to spending some weeks in South Africa. Professor and Mrs Findlay expect to return to England from Cape Town about 18 June.

With the end of his tour of India and Pakistan in sight, Professor Findlay can well be proud of the success which has attended his mission, and the Council is assured that his visit will have done good not only to the Institute but also to the general relations between British chemists and the chemists of India and Pakistan.

MISCELLANEOUS

Federation of British Industries: Tribute to Nobel Laureates.—The award of Nobel Prizes to two British scientists, Sir Edward Appleton and Sir Robert Robinson, in the same year called forth a special tribute to them from British Industry at a meeting arranged by the Federation of British Industries at the Royal Institution on 19 March. Addresses were given by the two distinguished recipients of the Nobel Prize on "The Scientist in Industry" and "The Scope of Organic Chemistry," respectively. Thus has British Industry honoured the continued pre-eminence of British Science, with the achievements of which industrial development has been so closely linked.

Scientific Research and Development in Northern Ireland.—In accordance with its policy of encouraging the increased application of the results of scientific and industrial research by industry in Northern Ireland, the Ministry of Commerce has formed a Council of Scientific Research and Development. Its work will be closely linked with that of the Directorate of Scientific Development of the Ministry of Commerce. Inquiries in connection with the activities of the Council should be addressed to the Director of Scientific Development, Ministry of Commerce, 20, College Gardens, Belfast.

XI International Congress of Pure and Applied Chemistry.—The Society of Chemical Industry has issued, as a supplement to *Chemistry and Industry*, a reprint of the six Congress Lectures delivered before the XI International Congress of Pure and Applied Chemistry in July, 1947. It comprises "Molecular structure and biological specificity," by L. Pauling; "Some recent results in organic chemistry," by P. Karrer; "Recent developments in electrophoresis," by A. Tiselius; "Simplex non veri sigillum," by B. C. P. Jansen; "The part of chemistry in the new therapeutics," by Sir Henry Dale, O.M.; "Le carbure de calcium et ses propriétés reductrices," by L. Hackspill.

S.I.M.A. Handbook.—The Scientific Instrument Manufacturers' Association, Ltd., has produced its first post-war edition of the *S.I.M.A. Handbook* (S.I.M.A., 26, Russell Square, London, W.C.1., price 10s. 6d.). Besides information about the Association, illustrated reviews of the British scientific instrument industry and a list of research organisations, the volume contains comprehensive lists of products and of member-firms.

International Union of Leather Chemists' Societies.—(See: JOURNAL AND PROCEEDINGS, 1948, I, 27.) The following have been elected as Provisional Officers of the International Union of Leather Chemists' Societies:—President, Professor Dr. P. Chambard; 1st Vice-President, Mr. J. R. Blockey (*Fellow*); 2nd Vice-President, Mr. J. Mallebay; Hon. Treasurer, Mr. W. R. Atkin; Hon. Secretary, Mr. A. Harvey (*Fellow*). The offices of the International Union are at "Craigieburn," Duppas Hill Road, Croydon, Surrey.

British Standards Institution.—B.S. 12: 1947—Portland Cement (ordinary and rapid-hardening), 146:1947—Portland-Blast furnace cement and 915:1947—High Alumina cement, have been prepared by the Cement, Lime and Gypsum Industry Standards Committee and issued recently. They are revisions of earlier standards. Copies may be obtained from the offices of the Institution, 28, Victoria Street, London, S.W.1, price 3s. 6d. net each, post free.

Research Association of British Rubber Manufacturers.—The Association publishes each month a "Summary of Current Literature"—a comprehensive digest of all the important available scientific and technological literature on rubber, plastics and materials used in the rubber and plastics industries. The price to the public is £18 per annum. Address 105, Lansdowne Road, Croydon, Surrey.

D.S.I.R. Fuel Research Report.—The Fuel Research Station, Blackwall Lane, East Greenwich, has recently published a report on "The Winning, Harvesting and Utilization of Peat" (H.M. Stationery Office, price 6d., by post 7d.).

Food Parcels from New Zealand.—With reference to the note in JOURNAL AND PROCEEDINGS, 1947, VI, 253, it has been learnt that members of the New Zealand Institute of Chemistry who are not also members of the New Zealand Section of the Royal Institute of Chemistry bore a generous share in sending food parcels during the past winter to those who are in receipt of regular grants from the Benevolent Fund. The Council wishes to take this opportunity of giving expression to its deep appreciation of this kindly action on the part of members of the sister Institute.

EXAMINATIONS, JANUARY, 1948

EXAMINATION FOR THE ASSOCIATESHIP IN GENERAL CHEMISTRY

Abstract of the Report of the Board of Examiners

Examiners Dr G M Bennett C B F R S and Dr T G Pearson

Entered	Passed
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The Examination was held in the Examinations Hall and Chemical Laboratory of the University of London South Kensington theoretical papers being taken also at various local centres in the week beginning Monday 19 January 1948 51 20*

- * Three candidates failed in part only of the examination and two candidates satisfied the Examiners in parts of the examination in which they had previously failed

The following papers and exercises were set —

MONDAY 19 JANUARY 1948 10 a m to 1 p m

(Answer FIVE questions only Give formulae and equations where possible)

- 1 Give a resume of the chemical and physical properties of the following compounds of the metals —(a) sulphides (b) sulphates (c) nitrates (d) carbonates

- 2 Define the term activity coefficient

Indicate how the mean activity coefficients of strong electrolytes vary with concentration and outline the theory which attempts to describe these variations quantitatively

The solubility in pure water of a salt MX_3 , where M is a tervalent cation and X a univalent anion is 2.0×10^{-5} moles per litre at $25^\circ C$. Calculate the solubility in 0.01 molar sodium chloride assuming that the Debye Huckel limiting law is applicable

- 3 Outline the advances that have been made during the last twenty five years in our knowledge of the nature of elementary hydrogen

- 4 Explain one method of determining the absolute entropy of a gas such as nitrogen
Indicate why the value for the entropy of a substance derived from thermal data may differ from the value derived from spectrographic data

- 5 Give a concise account of the chemistry of ONE of the following groups of elements —

(a) vanadium niobium and tantalum (b) chromium molybdenum tungsten and uranium

- 6 Explain the physical chemistry underlying the technique of precipitation in accurate gravimetric analysis

- 7 Give an account of the oxides and oxy acids of ONE of the following elements —
(a) bromine (b) nitrogen

2 to 5 p m

(Answer FIVE questions only Give formulae and equations where possible)

- 1 Derive the relationship between the maximum amount of electrical energy obtainable from a voltaic cell and the heat of reaction of the corresponding chemical change. The E M F of the cell $Pb|PbCl_2(s), KCl\text{ soln}, AgCl(s)|Ag$ is + 0.4913 volt at $18^\circ C$ and + 0.4900 volt at $25^\circ C$. Write down the cell reaction and calculate the heat evolved or absorbed per gram equivalent of chemical change at $25^\circ C$ (a) in the reversible discharge of the cell and (b) in the spontaneous occurrence of the cell reaction
 $F = 96,500$ coulombs 1 volt-coulomb = 0.2390 calorie

- 2 Discuss the implications of the term transition elements

- 3 Discuss the phenomena observed during (a) the evaporation of aqueous solutions of hydrated salts and (b) the de hydration of solid hydrated substances

- 4 Write an essay under ONE of the following titles —(a) Graphite and Graphitic Compounds (b) Non stoichiometric Compounds

5. Discuss in detail the kinetics of ONE gaseous reaction in which you have been interested. (The reaction should be thermal, not photo-chemical.)

6. Indicate the modes of occurrence and outline and explain the processes used in the extraction of ONE of the following:—(a) the platinum metals, (b) magnesium, (c) beryllium.

7. Discuss EITHER (a) colloidal electrolytes OR (b) the origin of the charge carried by a colloid particle.

TUESDAY, 20 JANUARY, 1948: 10 a.m. to 1 p.m.

(Answer FOUR questions only. Give formulae and equations where possible.)

1. How is acetone produced on the industrial scale (a) from acetylene and (b) from starchy materials?

Indicate briefly the reactions by which acetone may be converted into (i) a β -diketone, (ii) a doubly unsaturated ketone, (iii) a glycol, (iv) a benzene hydrocarbon, (v) a tertiary alcohol, (vi) a hydroxy-acid.

2. Describe the various methods available for methylating a substance in the laboratory.

What method would be used to methylate each of the following and what product would result:—glucose, benzene, phenol, benzoic acid, sodium arsenite, the enol of ethyl acetoacetate?

3. By what steps may the following substances be conveniently prepared using aniline as the starting material:—(a) quinol, (b) *m*-dichlorobenzene, (c) diphenyl, (d) *p*-aminoacetophenone, (e) *m*-nitrobenzoic acid, (f) *o*-aminobenzenesulphonic acid?

4. Classify the different types of isomerism which are known and give formulae illustrating one example of each type.

5. How has 2 : 6-dimethylpyrone been prepared? Mention briefly its characteristic chemical properties.

Give the evidence, both analytical and synthetical, for the structure of quercetin.

6. What are the essential differences between the structures of maltose and sucrose? What simple observations can be made which differentiate them?

Give a concise account of the structural investigation of ONE of these sugars.

7. Discuss ONE of the following subjects:—

- (a) the proteins,
- (b) the mechanism of alcoholic fermentation,
- (c) degradative oxidation as a method of determining chemical structure.

2 to 3.30 p.m.

Translation of French and German technical literature.

WEDNESDAY, 21 JANUARY, 1948: 10 a.m. to 4.30 p.m.

(Lengthy descriptions of practical work are not required. Make concise notes of your experiments as they are made and where possible in tabular form. State your final conclusions clearly.)

1. Examine qualitatively the aqueous solution (A) and report on its composition. (This exercise must be completed to-day.)

[(A) = aqueous 5-vol. hydrogen peroxide containing 2 per cent. orthophosphoric acid and 2 per cent. sulphuric acid.]

2. Solution (B) contains copper, aluminium and alkali metal sulphates. Determine the concentration in grams per litre of (a) copper and (b) aluminium by the following method:—Separate the copper as sulphide, and determine the copper *volumetrically* using standard sodium thiosulphate solution. Determine the aluminium *gravimetrically* in the filtrate from the copper sulphide using oxine. Pure copper and approximately 0.1N sodium thiosulphate are provided.

(The copper determination must be completed to-day. The aluminium determination may be completed to-morrow.)

3. Determine the concentration in grams per litre of sulphate ion in solution (B) gravimetrically.

(This determination may be completed to-morrow.)

THURSDAY, 22 JANUARY 1948 10 a m to 4 30 p m

(Lengthy descriptions of practical work are not required. Make concise notes of your experiments as they are made and where possible in tabular form. State your final conclusions clearly)

Complete the determinations 2 (b) and (3) begun yesterday

4 Examine qualitatively the mixture (C) and report on its composition [(C) = barium sulphate zinc phosphate and strontium citrate]

FRIDAY 23 JANUARY, 1948 10 a m to 4 30 p m

(Lengthy descriptions of practical work are not required. Make concise notes of your experiments as they are made and where possible in tabular form. State your final conclusions clearly)

1 Determine the percentage of silver in the given silver salt of an organic acid and deduce the equivalent of the acid

2 Separate the two components of the mixture (P) and identify both. Leave specimens of the pure components and of any derivatives you may make, each labelled with its name and m p or b p [(P) = *p*-cresol and phenetole OR *m* cresol and anisole]

SATURDAY 24 JANUARY 1948 10 a m to 4 30 p m

(Lengthy descriptions of practical work are not required. Make concise notes of your experiments as they are made and where possible in tabular form. State your final conclusions clearly)

3 Identify the single substance (Q) [(Q) sodium *p* chlorobenzoate OR sodium *p* chlorobenzenesulphonate]

4 From the cyclohexanone provided prepare small specimens of each of the following —

(i) the oxime (ii) the semicarbazone (iii) the dibenzylidene derivative (iv) adipic acid

Leave specimens each labelled with its name and m p

REPORT

Inorganic and Physical Chemistry

The answers to Q 1, Paper 1, tended to be diffuse. Candidates had plenty of information, but few selected the salient points and arranged them well. Generalisations made in answering Q 2 were rarely exemplified. The same fault tended to appear in answers to Q 6, Q 3, 5, and 7 were generally adequately treated. Few candidates answered Q 4.

On the whole the calculations given in answer to Q 1, Paper 2, were more accurate than usual, but there were still too many careless slips in signs and in the use of units. The implications of the term "transition element," Q 2, were for the most part satisfactorily presented, but quite a number of candidates referred only to the elements of Group VIII, whilst others made no mention of the characteristic poly valence coloured ions and para-magnetism of the elements of this Group. A number of answers to Q 5 were confined to the equilibrium state of such systems as nitrogen hydrogen ammonia and hydrogen-iodine hydrogen iodide. Some of the answers to Q 7 also illustrated the importance of reading questions carefully before attempting to answer them. The parts of this question asked respectively for a discussion of EITHER colloidal electrolytes OR the origin of the charge carried by a colloid particle. Several candidates gave general answers on the preparation and properties of colloids and made only passing references to the questions specifically asked them.

In a number of recent examinations, candidates have tended to prefer the inorganic to the neglect of the physical chemistry questions. In future examinations, therefore the first paper will be predominantly inorganic and the second paper predominantly physical in character. The special attention of future candidates is called to this re-arrangement. Candidates will be expected to satisfy the Examiners in both papers.

In the practical examination the quantitative exercises were on the whole well done. A number of candidates missed the hydrogen peroxide present in the Solution A. The mixture C given in Q 4 admittedly presented difficulties, but careful attention to the preliminary tests would have served to indicate the presence of barium, zinc and possibly

strontium also, the presence of an acid radical containing sulphur, or an organic radical, and the possible presence of a phosphate group. Many candidates apparently made only a cursory preliminary examination, passed straight to the group tests and not unnaturally found themselves in trouble.

Organic Chemistry.

Most of the questions set in this paper were answered at a fairly good standard, but very few candidates attempted Q. 5 on pyrone derivatives and the essays written for Q. 7 were generally unsatisfactory. An up-to-date knowledge of the chemistry of alcoholic fermentation was not shown by any candidate and the essays on the proteins were little better. A number of the accounts of oxidative degradation were more satisfactory, but the illustrations given were drawn too much from a single group of substances and candidates tended to take a point of view that was not sufficiently general.

In Q. 1 few candidates were familiar with the direct fermentation process for the production of acetone and butyl alcohol.

In Q. 3, asking for convenient methods of preparation of various substances from aniline, many very complicated procedures were advocated. *m*-Dichlorobenzene may be obtained easily via 2 : 4-dichloroacetanilide; diphenyl is readily prepared by decomposing the diazonium salt with copper powder in presence of alcohol. It suffices to use zinc chloride (not aluminium chloride) in order to prepare *p*-acetaminoacetophenone from acetanilide. *o*-Aminobenzenesulphonic acid is best obtained through *p*-bromo-aniline or *o*-nitroaniline.

The practical work was, on the whole, well done, but many candidates failed to identify anisole or phenetole.

PASS LIST

Examination in General Chemistry for the Associateship

- Auskerin, Henry, Merchant Venturers' Technical College, Bristol.
 Baldwin, Henry Donald, Acton Technical College, London.
 Bowen, John Peter, Birkbeck College and The Polytechnic, Regent Street, London.
 Cameron, James Brisbane, B.Sc.(Glas.), University of Glasgow and Acton Technical College, London.
 Carlier, Reginald John, B.Sc.(Lond.), Woolwich Polytechnic, London.
 Carr, Wilfrid Raymond, The Polytechnic, Regent Street, London.
 Downing, Stanley, Central Technical College, Birmingham.
 Fearn, Raymond Joseph, Technical College, Derby.
 Garwood, Miss Mavis Pauline, B.Sc.(Lond.), South-West Essex Technical College, Walthamstow.
 Heaton, John Burgess, Storey Institute, Lancaster, and Harris Institute, Preston.
 Jones, Rupert Douglas, Birkbeck College and Acton Technical College, London.
 Lewis, Richard Keith, Sir John Cass Technical Institute, London.
 Mason, Ian Sissons, Birkbeck College and Sir John Cass Technical Institute, London.
 Parisi, Walter Henry, College of Technology, Rugby.
 Slade, Jack Harry Ralph, Merchant Venturers' Technical College, Bristol.
 Stobbs, Robert William, City Technical College, Liverpool, and Royal Technical College, Salford.
 Topham, William Geoffrey, City Technical College, Liverpool.
 Turner, Geoffrey Burdett, Technical College, Coventry.
 Wolfenden, George, City Technical College, Liverpool
 Wyllie, William King Fullarton, Royal Technical College, Glasgow.

THE REGISTER

New Fellows

- | | |
|--|---|
| Akers, Sir Wallace Alan, C.B.E., B.A.
(Oxon.). | Cross, Edwin John, B.Sc., Ph.D. (Lond.). |
| Barry, Vincent Christopher, D.Sc.
(N.U.I.). | Evans, Elliott Alfred, M.Inst.Mech.E.,
F.Inst.Pet. |
| Bradley, Rupert Stevenson, M.A.
(Cantab.). | Happold, Professor Frank Charles, Ph.D.,
D.Sc. (Manc.). |
| Bradley, Professor William, M.Sc., Ph.D.
(Manc.). | Hinshelwood, Professor Cyril Norman,
M.A., D.Sc. (Oxon.), Hon. D.Sc.
(Dublin), Hon. D.Sc. (Lond.), F.R.S. |

Mittler, Gustav Adolf, Ph D (Vienna)
 Rogan, Harold, B Sc , Ph D (Liv)
 Sharratt, Lt -Col Walter, M Sc (Manc)

Warren, Frederick Lloyd, M A , B Sc (Oxon), Ph D , D Sc (Lond)
 Whalley, Harold Kenneth, M A , Ph D (Cantab)

Associates to Fellowship

Balloch, Alexander, B Sc (Glas)
 Barnett, John, B Sc , Ph D (Lond)
 Bennett, Arthur
 Blair-McGuffie, Malcolm Hugh, B Eng . (McGill), M I Chem E
 Bourne, Geoffrey John, B Sc (Lond)
 Cahn, Robert Sidney, M A (Cantab), D Phil Nat (Frankfurt)
 Downes, Hector Ingram, M Sc (Wales), F C I P A
 Hall, Leslie, B Sc , Ph D (Lond)
 Hamilton, George Narne Gordon, D Sc (Glas), F G S
 Hillman, Herbert Colston, B Sc (Bris)
 Holt, Arthur, B Sc (Lond)
 Klyne, William, M A , B Sc (Oxon), Ph D (Edin)

MacDonald, Alexander Craig, B Sc (Glas)
 Merrick, Leslie, M Sc Tech (Vict)
 Morgan, David Cecil, B Sc (Wales)
 Newman, Mrs Helen Mackay, M B E , M A , B Sc (Aberd)
 Price, David Hermon Andrew, B Sc (Birm)
 Ritchie, Alexander, B Sc , Ph D (St Andrews), A M I Chem E
 Rolfe, Horace George, B Sc (Lond), Ph C
 Russell, William Lyle, A H -W C
 West, Donald Willoughby Capon, A C G I
 Whitehead, Alan Douglas, B Sc (Lond)
 Wilson, Rupert Marcus Walter William, B Sc (Lond), A R C S , A M I Chem E

New Associates

Abbott, John Russell, B Sc (Lond)
 Ablewhite, Stanley Arthur John, B Sc (Lond)
 Auskerin, Henry
 Bain, Alistair Angus John, B Sc (Lond)
 Baldwin, Henry Donald
 Barnard, Harold Randall, B Sc (Lond)
 Bird, Philip Lorraine
 Blyth, Jabez George
 Bowen, John Peter
 Brockwell, Victor Charles Hultgren, B Sc (Lond)
 Burdon, Martin Clive, B Sc (Lond)
 Cameron, James Brisbane
 Carlier, Reginald John, B Sc (Lond)
 Carr, Wilfrid Raymond
 Chandler, Romily David Thomas Ernest, M P S
 Clare, Kenneth Ernest, B Sc (Lond)
 Clark, Thomas Morton, B Sc (Lond)
 Crawford, Cyril Gunn, B Sc (Q U B)
 Drey, Rudolf Eric Arnold, B Sc (Lond)
 Dennis, Peter Owen, B Sc (Lond)
 Desai, Jayant Nanalal, B Sc (Bombay)
 Doggart, James Russell, M Sc (Q U B)
 Downing, Stanley
 Ellinger, Leo Philipp, M A , D Phil (Oxon)
 Fearn, Raymond Joseph
 Flockhart, Brian Duncan, M Sc (Q U B)
 Frampton, David Albert, B Sc (Lond)
 Franklin, Charles Edmund Leonard, B Sc , Ph D (Wales)
 Garwood, Miss Mavis Pauline, B Sc (Lond)
 George, Neville Collis M Sc (Manc)
 Glen, John Mathie, B Sc (Glas)
 Goode, Alan Trevor, B Sc (S A)
 Gordon, John Prebble B Sc (Lond), A R C S

Greenwood, Charles Trevor, B Sc (Birm)
 Grossman, Sydney, B Sc (Glas)
 Hampton, John Winnall Franklin, M A (Cantab)
 Harris, Frank William
 Heaton, John Burgess
 Hobson, Peter Norman, B Sc (Birm)
 Howard, Michael Augustus, B Sc (Leeds)
 Hunt, Charles Henry, A A C I
 Jepson, John Buchan, M A (Cantab), B Sc , D Phil (Oxon)
 Jones, John Dewi, B Sc (Wales)
 Jones, Rupert Douglas
 Kalthod, Gurudathrao Ganapathrao, B Sc Tech (Bombay)
 Khundkar, Mukharram Hussain, M Sc (Dacca)
 Langley, Kenneth Geoffrey, B Sc (Lond)
 Lewin, Aleksander, B Sc (Lond)
 Lewis, Dyfed, B Sc (Wales)
 Lewis, Richard Keith
 Loewenstein, Klaus Leopold B Sc (Lond)
 Lucking, Paul Anthony, B Sc (Lond)
 Martin, Ewan Cameron, A S T C , A A C I
 McCabe, James, B Sc (Dunelm)
 McDonnell, Francis Robert Maxwell, M Sc (Q U B)
 Menary, James Wilson, B Sc (Q U B)
 Meyer, Herbert Ph D (Cologne)
 Moore, Frederick Joseph, B Sc (Lond)
 Morgan John Toriel, B Sc (Wales)
 Musgrave, Oliver Charles
 Needleman, Benjamin, B Sc (Lond)
 Nendick, Gordon William, B Sc (Lond)
 Neville, Francis Michael B Sc (N U I)
 Page, Roland Burnand B Sc Tech (Manc)
 Palmer, Richard Gilbert M A (Cantab)
 Parriss Walter Henry
 Parsons Roger B Sc (Lond)

Patrick, Gordon, B.Sc. (Lond.).
 Robertson, Oswald, B.Sc. (Glas.).
 Robinson, George Leonard.
 Robinson, Ian Francis Stuart, M.Sc. (Lond.), A.R.C.S., D.I.C.
 Rosen, Gordon Drielsma, B.Sc. (Liv.).
 Schouhal, Edouard.
 Sharpe, Sidney Bertrand, B.Sc. (Liv.).
 Shaw, Michael, B.Sc. (Lond.).
 Shine, Henry Joseph, B.Sc., Ph.D. (Lond.).
 Shuttleworth, Duncan, B.Sc. (Lond.).
 Silk, Michael Hugh, M.Sc. (S.A.).
 Simmonds, Miss Alma Beryl, B.Sc. (Lond.), Ph.C.
 Slade, Jack Henry Ralph.
 Smith, John Frederick, B.Sc. (Wales).
 Snadow, Ronald, B.Sc. (Lond.).
 Stern, Edward Severin, B.Sc., Ph.D. (Lond.), A.R.C.S., D.I.C.

Swain, Tony, B.Sc. (Lond.).
 Swallow, Albert John, B.Sc. (Birm.).
 Tatton, Juston O'Grady, M.Sc. (Lond.).
 Taylor, George Theobald, B.A. (T.C.D.).
 Thakur, Babue Lal, M.Sc. (Patna).
 Thomas, Leslie Charles, B.Sc. (Lond.).
 Thomas, Ronald Guyton, B.Sc. (S.A.).
 Topham, William Geoffrey.
 Turner, Geoffrey Burdett.
 Turner, Mervyn Edward Dennant, B.Sc. (Lond.).
 Wapenaar, Johannes Petrus, B.Sc. (S.A.).
 Weil, Hans Georg, B.Sc. (Lond.).
 Wells, Edward Robert, B.Sc. (Lond.).
 White, Reginald Percy, B.Sc. (Lond.).
 Wolfenden, George.
 Wren, William Lees, B.Sc. (Lond.).
 Wyllie, William King Fullerton.

Re-elected Associates

Hughes, William Frederick, M.A. (Can-tab.).
 McFadden, Alexander, B.Sc. (Glas.).

Robinson, Albert Edward, B.Sc. (Liv.).
 Stobbs, Robert William.

New Students

Anderson, David Keith.
 Aspden, James Geoffrey.
 Atkinson, Richard Maxwell.
 Brant, Edward William.
 Birkett, Leonard.
 Briggs, James Anthony.
 Briggs, Patrick Ivor.
 Bullock, Richard Manus.
 Butterworth, Miss Joan.
 Challis, James Anthony.
 Chapman, Frederick Arthur.
 Collins, Miss Edith Lilian.
 Denyer, Peter Edmund.
 Dickens, Harry, Jnr.
 Dixon, John Roy.
 Doggett, Richard Hugh.
 Eborall, Frank Edward.
 Eggleton, Alan Edwin John.
 Farthing, Sydney.
 Faure, Anthony Gerhard.
 Frost, Robert Harry.
 Gledhill, Dyson.
 Goldsmith, Miss Betty Dorothy.
 Hannaby, William Berwyn.
 Hesp, Paul Granville.
 Hills, Peter Robert.
 Holt, Roland.
 Howarth, John.
 Jeffery, Bryan.
 Lee, George Raymond.
 Lewis, William.
 Liversage, David Trevor.
 Lonsdale, Ernald.
 Mauritzen, Charles Albert Michael.
 McDonnell, James.

McNamara, Dennis Gordon.
 Millar, Ian Torrance.
 Miller, Horace Vernon.
 Miller, Keith Alan.
 Morris, George Sheldon.
 Moule, Howard Antrobus.
 Murray, John Patrick.
 Nicholson, John.
 Ogden, Kenneth George.
 Ottewill, Ronald Harry.
 Passmore, Richard Ian Oliver.
 Pawley, John Raymond.
 Plumley, Leslie Eli.
 Rae, Edward John.
 Roberts, Dennis Reginald Thomas.
 Russell, Patrick.
 Schmeidler, Gunter Arthur.
 Sheard, Miss Christine Patricia.
 Shears, Eric Campbell.
 Skinner, Donald Alfred.
 Smith, John William Gordon.
 Smith, Ronald Herbert.
 Sperring, Peter Adrian Hugh.
 Stevens, Peter Frank Edward.
 Stroud, Kenneth Cecil George.
 Sudaby, Donald.
 Summerside, Keith Anthony.
 Sutton, John Frank Hoad.
 Theaker, Gordon.
 Wade, Miss Maureen Mavis Scott.
 Wale, George James.
 Wilshire, Herbert David.
 Wood, Barrie.
 Wright, Patrick William.

Re-registered Student

Galloway, Robert Macleod.

DEATHS

Fellows

Thomas Cooksey, B Sc (Lond), Ph D (Marburg), F A C I	George Stanley Withers Marlow, B Sc (Lond), Barrister at Law
John Chester Cowap, B Sc (Vict)	George McGowan, Ph D (Leipzig), F R S E
Bernard Furley Davis	Albert Henry Mitchell, B Sc (Lond)
Bernard Dyer, D Sc (Lond)	George Steedman, A R T C
Charles James John Fox, B Sc (Lond), Ph D (Breslau)	Montagu White Stevens, A R C S
	John Henry Sugden, M Sc (Vict)

Associates

Peter Bourhill	Subikas Das Gupta, B Sc (Calcutta), M Sc Tech (Manc)
Arthur Herbert Clark, B Sc (Birm)	William Stephen Milne, B Sc (Lond), M I Chem E

OBITUARY

EDWARD CHARLES CYRIL BALY died on 3 January, 1948, in his 77th year

He was educated at Temple Grove School, Aldenham, and University College, London, and became an Associate of the Institute in 1892. In 1899 he joined the teaching staff of University College, becoming, in 1903, assistant professor of chemistry under Sir William Ramsay and lecturer in spectroscopy. He was elected a Fellow of the Royal Society in 1909. A year later he succeeded Campbell Brown as Grant Professor of Inorganic Chemistry in the University of Liverpool, which Chair he held until his retirement in 1937. He took the degree of M Sc (Liverpool) and was made Hon D Sc of Benares University.

During the 1914-18 war he was deputy inspector of high explosives for the Liverpool area and in 1918 was awarded the C B E for his services.

Baly established his reputation by his researches and his great monograph on spectroscopy, but after the First World War he turned his attention to the chemistry of the photosynthetic processes in the living plant, on which he published a book in 1940.

He served on the Councils of the Chemical Society and the British Association of Chemists, as well as in many capacities in the University of Liverpool.

He was elected an Associate of the Institute in 1892 and a Fellow in 1901. He served on the Council from 1918 to 1921 and as a Vice-President from 1924 to 1927.

LOUIS PIERRE BOSMAN died in Cape Town on 26 November, 1947, in his 53rd year.

Educated at the Normal College Boys' High School and the South African College School, he proceeded to the South African College (later the University of Cape Town), where he graduated B A in 1915. After a period as a junior lecturer in chemistry at the University, he came to Edinburgh to study under Sir James Walker and obtained the degrees of B Sc and Ph D at the University of Edinburgh. Returning to South Africa in 1922 he became senior lecturer in biochemistry in the University of Cape Town. Whilst holding this post he studied medicine and qualified M B, Ch B in 1933. In that year he went into private practice as a clinical pathologist. He was also honorary lecturer in physiology at the University. He was a Fellow of the Royal Society of South Africa.

Bosman took an active part in public life. After serving successively on the Cape Town City Council and the Cape Provincial Council, he was elected to the South African Parliament in 1943.

He was elected an Associate of the Institute in 1921 and a Fellow in 1946.

PETER BOURHILL died on 20 January, 1948, in his 65th year.

He received his early education at Dalkeith High School and Dalkeith Higher Grade School. After serving in the army during the 1914-18 War and being badly wounded, he entered the service of the Lothian Coal Company, Ltd., Newton Grange, Midlothian, in 1921, at the same time commencing his scientific training at the Heriot-Watt College, Edinburgh. He was subsequently Head Fuel Chemist to the Company.

He was elected an Associate of the Institute in 1933.

ARTHUR HERBERT CLARK died early in 1948, in his 59th year.

Educated at Earlestow District School and Warrington Secondary School, he entered the University of Birmingham in 1912 and was awarded the B.Sc. degree for research in mine rescue work. He was for three years lecturer and demonstrator in mine rescue work and the chemistry of mining at the University.

He was later occupied in research work at the British Coal Dust Station, Altofts, and the Home Office Experimental Station, Eskmeals, and in 1915-16 worked on gas respirators and poison gas, before being appointed research chemist at H.M. Factory (Chance & Hunt, Ltd.), Oldbury. He subsequently became Assistant Manager and later Manager of the Fuel Department of J. Crosfield & Sons, Warrington.

He was elected an Associate of the Institute in 1918.

PERCY BROADBENT CROSSLEY died on 3 July, 1947, in his 60th year.

He was educated at the Central High School and the College of Technology, Manchester. From 1904 to 1909 he worked with Beyer, Peacock and Co., Manchester. He then accepted an appointment under the Government of India as metallurgist in the Indian Ordnance Factory, Cossipore, and became chemist and metallurgist in 1914. In 1918 he became consulting chemist and metallurgist to Hoare, Miller & Co., Ltd., Calcutta. Returning to this country he worked with the General Electric Co., and the Allgemeine Elektricitats Gesellschaft, Berlin, before taking up an appointment with the Ford Motor Co., Ltd. In 1934 he became chief chemist to Enfield Rolling Mills Co.

He was elected a Fellow of the Institute in 1925.

SUBIKAS DAS GUPTA was murdered in the street in Calcutta on 21 April, 1947, in his 35th year.

Educated at the Scottish Church Collegiate School, the Puddopukur Institution and the Hindu School, Calcutta, he commenced his scientific training at the University of Calcutta and graduated B.Sc. in 1933. From 1935 to 1938 he studied at the College of Technology, Manchester, and was awarded the degrees of B.Sc. Tech. (in Textile Chemistry) in 1937 and M.Sc. Tech. in 1938. Returning to India he worked for a time in the dyeing department of the Raipur Manufacturing Co., Ltd., Ahmedabad, before joining the teaching staff of the Government Central Textile Institute, Cawnpore, U.P.

He was elected an Associate of the Institute in 1939.

ANDREW JAMES DIXON died in 1941 at the age of 70.

He studied at the Glasgow and West of Scotland Technical College and the Royal School of Mines, South Kensington. In 1893 he entered his father's analytical and assaying practice in Sydney, New South Wales, and, after his father's death, carried on the practice until he retired some years ago.

He was elected an Associate of the Institute in 1891 and a Fellow in 1896.

JOHN DON died on 2 January, 1947, in his 86th year.

He received his scientific training in the University of Aberdeen, graduating M.A. (Aberdeen) and B.Sc. (London). He was for ten years Principal Assistant in the Higher Department of Raining's School, Inverness. From 1893-98 he was Principal of the Burgh Technical School, Inverness. During 1899-1900 he worked in the Laboratory of I. F. Tocher, Peterhead, and in the latter year became Rector of Peterhead Academy. In 1906 he moved to the Carrick Academy, Maybole, Ayrshire. In later years he practised as a consulting chemist.

He was elected a Fellow of the Institute in 1903.

BERNARD DYER died on 12 February, 1948, in his 92nd year.

Educated at the City of London School, he became pupil and assistant to Augustus Voelcker in 1873, and continued his studies at King's College, the Royal College of Science and the Pharmaceutical Society. He graduated B.Sc. of the University of London in 1886 and D.Sc. in 1892. In 1876 he established a practice as analytical, agricultural and consulting chemist, at 17, Great Tower Street, London, and in due course became Official Agricultural Analyst to several Counties and Public Analyst to many Counties and Boroughs.

Dyer was one of four Associates elected at the first regular General Meeting of the Society of Public Analysts (now the Society of Public Analysts and Other Analytical Chemists) on 5 February, 1875, and throughout his life took a deep interest in the work of the Society. He became a member of its Council in 1880. In 1883 he was elected Hon. Secretary (with Otto Hehner) and continued to fill this position until 1897, when he was elected President.

He was a member of the Council of the Chemical Society 1893-97 and 1904-08.

He was the author of several books and of a large number of scientific papers, principally on fertilisers, soils and other agricultural subjects.

Dyer was elected an Associate of the Institute in 1878 and a Fellow in 1880. He served on the Council for six periods, 1889–92, 93–96, 97–99, 1903–06, 07–08 and 26–29; was an Examiner from 1899 to 1903 and again from 1915 to 1925; was a Vice-President, 1908–10 and filled the office of Censor, 1919–24.

DONALD HELMSLEY HEWITT died on 25 August, 1947, in his 32nd year.

He received his early education at West House School, Edgbaston, Birmingham, and Bromsgrove School, Worcestershire, proceeding to Corpus Christi College, Cambridge, in 1934, where he graduated B.A. in the Natural Science Tripos in 1937.

In 1938 he joined the staff of Jenson and Nicholson, Stratford, London, and in the following year was appointed to the research staff of Lewis Berger & Sons, Ltd., becoming personal assistant to the Director of Research and Technical Operations in 1941.

He was elected an Associate of the Institute in 1943.

CHRISTOPHER LAMBOURNE died in 1946 in his 67th year.

Educated at New College School and the City Technical Institute, Oxford, he entered the University of Oxford and graduated M.A. After three years at Portsmouth Technical Institute he was in charge of science teaching for Cardiff Higher Education Committee from 1907 to 1911, when he took charge of the Chemical and Physical Departments of the South Wales School of Mines. In 1915 he entered the Department of Explosives Supply of the Ministry of Munitions and later became Director of a department for the production of mineral oil from coal. More recently he practised as a consultant in fuel technology.

He was elected a Fellow of the Institute in 1917.

BARRADALE WHIDDON MELHUISH died on 8 November, 1947, in his 53rd year.

He received his early education at Wellington School, Somerset, and later studied at the School of Pharmacy of the Pharmaceutical Society, where he was Bell Scholar in 1916 and won the bronze medal for chemistry and *materia medica*, the Martindale medal and the silver medal for chemistry. He qualified as a chemist and druggist in 1917 and as a pharmaceutical chemist in 1920, later obtaining the B.Sc. degree of the University of London. From 1920 he was assistant lecturer and demonstrator in the School of Pharmacy of the Pharmaceutical Society, before becoming superintendent of the Society's examinations.

He was elected an Associate of the Institute in 1922.

ALBERT HENRY MITCHELL died on 16 February, 1948, in his 90th year.

He received his early education at Longwood Grammar School, Huddersfield and St. John's College, York. After holding various teaching appointments, he began his scientific training at Owens' College, Manchester, and continued later at the Birkbeck Institution (later Birkbeck College), University College and the Royal College of Science, London, graduating B.Sc. of the University of London. He was science master at Camberwell Grammar School from 1892 to 1895 and was then appointed Head of the Chemical Department of Tiverton Technical School, Devon. In 1895 he set up in private practice and became Borough Analyst for Tiverton, which post he held until two or three years ago. He was also consultant to Heathcote & Co.

He was elected a Fellow of the Institute in 1901.

CHARLES AINSWORTH MITCHELL died on 5 January, 1948, in his 81st year.

He was educated at King William's College, Isle of Man, and entered Exeter College, Oxford, in 1887. He graduated B.A. in 1889 and proceeded to M.A. in 1919 and D.Sc. in 1929. In 1894 he became assistant to Otto Hehner and in 1895 was appointed chemist to Beaufoy & Co., vinegar manufacturers, Lambeth, with whom he remained until 1932. Subsequently he was consultant to British Vinegars, Ltd.

Mitchell was President of the Medico-Legal Society, 1935–37, and was elected an Honorary Vice-President of the Medico-Legal Society of France in 1937. He was Editor of *The Analyst* from 1921 to 1945, served on the Council of the Society of Public Analysts and Other Analytical Chemists, 1899–1900, and was Secretary of the Society from 1925 to 1937.

He was the author of many books on forensic chemistry and other subjects and of numerous articles in scientific and literary journals.

He was elected an Associate of the Institute in 1893 and a Fellow in 1897. He was a Member of Council, 1928–31 and 1934–37, Vice-President, 1937–40, and Censor, 1935–36.

KOHITISH CHANDRA MUKHERJI died on 4 February, 1944, in his 52nd year.

He studied at Dacca College from 1908 to 1913 and was awarded the degrees of B.Sc. and M.Sc. of the University of Calcutta. From 1913 he was successively Government Research Scholar and lecturer in Chemistry at Dacca College. In 1917 he was appointed Inspector of Excise and Salt under the Government of Bengal and in 1920 became Assistant Research Chemist at the Government Technological Institute, Cawnpore. From 1924 to the time of his death he was Industrial Chemist to the Government of the United Provinces at Cawnpore.

He was elected an Associate of the Institute in 1925.

HAROLD THOMAS NAUGHTIN, a Registered Student, was reported missing on 28 May, 1941, whilst on operational duties as a Pilot in the Royal Air Force, and is now presumed killed. He was in his 22nd year.

He was educated at Palmer's College, Grays, Essex, and Sir Joseph Williamson's Mathematical School, Rochester, Kent. In 1938 he received an appointment with Berry, Wiggins & Co., at Rochester, and continued his studies at Medway Technical College, until he entered the Royal Air Force in 1939.

ARTHUR CHAMBERS PRIGGE died on 12 October, 1943, while a prisoner of war in Japanese hands, in his 30th year.

He was educated at Dr. Challoner's Grammar School, Amersham, and Wesley College, Dublin, and entered Trinity College, Dublin, in 1932, graduating B.A. (first class Moderatorship in Experimental Science) in 1936 and M.Sc. After a period as Demonstrator in Trinity College, he was appointed to the Colonial Education Service in 1938, as Science Master at the Sultan Abdul Hamid College, Kedah, Malaya. War had broken out before his arrival in Singapore and he was detained for some time on special duties before proceeding to the College. He joined the Straits Settlements Volunteer Force and was taken prisoner on the fall of Singapore.

He was elected an Associate of the Institute in 1937.

WALTER RAYMOND SCHOELLER died on 19 December, 1947, in his 68th year.

Educated at the Royal Athenaeum, Antwerp and Tournai, Schoeller received his technical training at the Polytechnic Institutes of Darmstadt and Stuttgart and the University of Greifswald, being awarded the degree of Ph.D. in 1902.

He came to this country in 1903 as Chief Chemist to D. C. Griffith and Co. Belgian by birth, he became a naturalised British subject in 1909. From 1906-1911 he travelled in the U.S.A. and China, returning in the latter year as research chemist to the British Gelatine Works, Luton. In 1914 he was appointed Chief Chemist to G. T. Holloway, Ltd., and in 1915 became metallurgist to the Thames Smelting and Refining Co., Ltd. In 1916 he returned to D. C. Griffith & Co. After an interruption of work due to ill health, he was appointed, in 1946, Chief Chemist to Baker Platinum, Ltd.

Schoeller published many scientific papers and contributed chapters to several standard works of reference. He was the author of *The Analysis of Minerals and Ores of the Rarer Elements* (with A. R. Powell) and of *The Analytical Chemistry of Tantalum and Niobium*. For his researches in the latter subject he was granted a Sir George Beilby Memorial Award in 1932.

He was elected an Associate of the Institute in 1918 and a Fellow in 1935.

NAGENDRA NATH SEN-GUPTA died on 29 July, 1947, in his 52nd year.

He received his early education at the Chittagong High School and matriculated in the University of Calcutta. Coming to Armstrong College, Newcastle-upon-Tyne, in 1915, he graduated B.Sc. in the University of Durham, with first-class honours in agriculture, and later M.Sc. From 1919 to 1922 he engaged in research in soil biochemistry at Rothamsted Experimental Station. In 1923 he returned to India as Professor at Allahabad Agricultural Institute and in 1925 entered the Government Test House, Alipore, Calcutta, becoming Head of the Chemical Section later in that year.

He was elected an Associate of the Institute in 1930.

JAMES SMITH died on 30 October, 1947, in his 69th year.

He received his scientific training at the Liverpool School of Science, Technology and Art (now the City of Liverpool Technical College), winning the Derby and Tate prizes. In 1895 he joined the firm of Geo. Watson Gray, consulting chemists, in Liverpool, becoming a partner in 1919, and, on G. W. Gray's death in 1928, senior partner.

He was elected a Fellow of the Institute in 1919.

MONTAGUE WHITE STEVENS died in Shanghai on 29 December, 1947, in his 67th year. Educated at Mannamead School, Plymouth and Plymouth College, he entered the Royal College of Science, London, in 1899, obtaining the A R C S diploma in 1902. After a short period as assistant chemist with Stangor and Blount, Westminster, he was for ten years Assistant Examiner in the Patent Office. At the end of the 1914-18 War he went to China as an Officer in the Hongkong Ordnance Corps. He moved to Shanghai in 1929, was with the Shanghai Waterworks Company for two years and professor of mathematics at the Lester Technical Institute. In more recent years he was associated with the Shanghai Chemical Laboratory, except for a period of internment following the Japanese invasion.

He was elected an Associate of the Institute in 1903 and a Fellow in 1913.

ALEXANDER BENHAM STICH died on 6 January, 1948, in his 59th year.

He was educated at the Paisley Grammar School and proceeded to the University of Glasgow in 1906, graduating B Sc and later M B, Ch B. He subsequently practised medicine.

He was elected an Associate of the Institute in 1913.

RALPH CHARLES STOREY died on 2 December, 1947, in his 47th year.

After receiving a general education at Christ Church School, Upper Armley and the West Leeds High School, he entered the University of Leeds in 1920, graduating B Sc with second-class honours in colour chemistry and dyeing in 1923 and proceeding to M Sc. Awarded a Clothworkers' Research Scholarship, he continued research at the University under A G Perkin and was awarded the Ph D in 1926. He was then employed in further research at the University by the Graesser Monsanto Chemical Co, Ltd. In 1927 he became research chemist in the Dyestuffs Research Department of British Celanese, Ltd., at Spaldon. From 1931-35 he was a chemist with John Crockatt, Ltd., and in the latter year was appointed chief research chemist to the Yorkshire Dyeware and Chemical Company, Ltd., becoming in due course Chief Chemist and Technical Manager of their Wood and Bedford Branch in Leeds. At the time of his death he was a Director of the Company. The results of his researches were embodied in many patent specifications.

He was elected an Associate of the Institute in 1924 and a Fellow in 1941.

1948

COMING EVENTS

April

5-6 SOCIETY OF CHEMICAL INDUSTRY (London Section) Symposium "Detergents, Wetting and Emulsifying Agents". At The Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W C 2.

6 SOCIETY OF CHEMICAL INDUSTRY (Chemical Engineering Group) "Modern Propellants". Mr J M Pring, in the Rooms of the Geological Society, Burlington House, Piccadilly, London, W 1, at 5.30 p m.

7 SOCIETY OF PUBLIC ANALYSTS AND OTHER ANALYTICAL CHEMISTS Ordinary Meeting, in the Rooms of the Chemical Society, Burlington House, Piccadilly, London, W 1, at about 7.15 p m.

BRITISH ASSOCIATION OF CHEMISTS Demonstration of Scientific Apparatus. In the Nicholson Lecture Theatre, University of Liverpool, at 7 p m.

INSTITUTE OF FUEL (North-Western Section) Annual General Meeting (1.30 p m.) "External Deposits on the Heating Surface of Boiler Plant". Dr H E Crossley, at the Engineers' Club, Albert Square, Manchester, 2, at 2.30 p m.

INSTITUTE OF WELDING (Manchester and District Branch) Annual General Meeting "Welding in Railway Workshops". Mr G Foster in Reynold's Hall College of Technology, Manchester, at 7 p m.

8 CHEMICAL SOCIETY Reading of short, original communications. In the Chemistry Department, University of Manchester, at 6.30 p m.

INSTITUTE OF METALS Annual General Meeting (6 p m.) Open Discussion on "The Oxidation of Metals". Professor N F Mott, F R S and Dr J H Mitchell, at 4, Grosvenor Gardens, London, S W 1 at 7 p m.

April

- 9 BIOCHEMICAL SOCIETY: Meeting at Dublin.
- TEXTILE INSTITUTE: Meeting at the Textile Institute, Manchester, at 1 p.m.
- OIL AND COLOUR CHEMISTS' ASSOCIATION (Manchester Section): Annual General Meeting, at the Engineers' Club, Albert Square, Manchester, 2, at 6.30 p.m.
- 12 THE INSTITUTE (Hull and District Section): "The Electrochemical Mechanism of Corrosion." Dr. U. R. Evans, at the Royal Station Hotel, Hull, at 7 p.m.
- INSTITUTION OF THE RUBBER INDUSTRY (Midland Section): Experimental Evening: "Demonstrations with Rubber." Mr. E. F. Powell, at the James Watt Memorial Institute, Great Charles Street, Birmingham, 3, at 7.15 p.m.
- INSTITUTE OF PETROLEUM (Northern Branch): Meeting at the Engineers' Club, Albert Square, Manchester, 2, at 6 p.m.
- 13 SOCIETY OF CHEMICAL INDUSTRY (Plastics Group): "Temperature Sensitivity of the System Plasticiser/Polymer." Messrs. H. Jones and E. Chadwick, in the Rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1, at 6.30 p.m.
- SOCIETY OF INSTRUMENT TECHNOLOGY (North-West Section): "Automatic Control Applications in the Chemical Industry." Mr. H. Schmitt (paper to be presented by Mr. G. B. Harvey), at the College of Technology, Manchester, at 7.15 p.m.
- 14 THE INSTITUTE (Sheffield, South Yorkshire and North Midlands Section): Visit to Wood Bros. Glass Works, Barnsley (2.30 p.m.); Lecture. Professor H. Moore, at Barnsley Mining and Technical College, at 6 p.m.
- INSTITUTE OF PETROLEUM: "Properties of Paraffin Wax as an Effect of Composition." Mr. S. T. Minchin, at Manson House, 26, Portland Place, London, W.1 at 5.30 p.m.
- 15 THE INSTITUTE (Liverpool and North-Western Section): Annual General Meeting. "X-ray Study of Glyceride Polymorphism." Dr. T. Malkin, in the Chemistry Lecture Theatre, University of Liverpool, at 7 p.m.
- INSTITUTION OF MINING AND METALLURGY: General Meeting. In the Rooms of the Geological Society, Burlington House, Piccadilly, London, W.1, at 4.15 p.m.
- PHARMACEUTICAL SOCIETY (Manchester, Salford and District Branch): Annual General Meeting. In the Council Chamber, Houldsworth Hall, Manchester, at 7.45 p.m.
- 15-16 The Institute: Anniversary Meetings, including the Annual General Meeting, on 16 April, at 3.30 p.m., in Birmingham (see p. 129).
- ELECTRODEPOSITORS' TECHNICAL SOCIETY: Annual Conference, at the Imperial Hotel, Temple Street, Birmingham.
- 16 INSTITUTION OF THE RUBBER INDUSTRY (Leicester Section): Annual General Meeting. "The Past, Present and Future of Rubber." Mr. F. N. Pickett and Dr. H. J. Stern, at the Bell Hotel, Humberstone Gate, Leicester, at 7 p.m.
- INSTITUTION OF CHEMICAL ENGINEERS: Annual Corporate Meeting, at the Connaught Rooms, Great Queen Street, London, W.C.2, at 11.45 a.m. President's Address, "The Chemical Engineer and Civilisation," by Mr. H. W. Cremer, at 2.30 p.m.
- SOCIETY OF DYERS AND COLOURISTS (Manchester Section): Lecture. Dr. C. M. Whittaker, in the Lecture Theatre, Gas Department Showrooms, Town Hall Extension, Manchester, at 6.30 p.m.
- BRITISH INTERPLANETARY SOCIETY: "High Strength Hydrogen Peroxide for Rocket Propulsion." Messrs. V. W. Slater and W. S. Wood, in the Lecture Theatre, Science Museum, South Kensington, London, S.W.7, at 7 p.m.
- 19 PLASTICS INSTITUTE (Midlands Section): "Polystyrene." Mr. A. A. K. Whitehouse, at the James Watt Memorial Institute, Great Charles Street, Birmingham, 3.
- 20 SOCIETY OF CHEMICAL INDUSTRY (Agriculture Group): "Carbohydrate Metabolism in Soil." Dr. W. G. C. Forsyth, in the Chemistry Department, Royal College of Science, South Kensington, London, S.W.7, at 2.30 p.m.

April

- 20 ROYAL SOCIETY OF ARTS (Dominions and Colonies Section) "The New East African Ground Nuts Scheme" Mr A J Wakefield, C M G, at the Royal Society of Arts, John Adam Street, Adelphi, London, W C 2, at 2 30 p m
- HULL CHEMICAL AND ENGINEERING SOCIETY Annual General Meeting At the Church Institute, Albion Street, Hull, at 7 30 p m
- INSTITUTION OF THE RUBBER INDUSTRY (London and District Section) Annual General Meeting and film evening At Caxton Hall, Caxton Street, London, S W 1
- SOCIETY OF DYERS AND COLOURISTS (Huddersfield Section) "An Assessment of Commercial Mothproofing Agents" Messrs J Barritt and R S Hartley, in Field's Cafe, Westgate, Huddersfield, at 7 30 p m
- SOCIETY OF DYERS AND COLOURISTS (Scottish Section) Annual General Meeting "An Investigation into the Practical Aspects of the Absorption of Acid and Chrome Dyes by Wool" Mr G H Lister, at the St Enoch Hotel, Glasgow, at 7 p m
- 21 THE INSTITUTE (London and South-Eastern Counties Section) Symposium on "Laboratory Lay-out and Construction" Mr C L Prior, Professor W H Linnell, Mr J Haslam and others, at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W C 1, at 4 p m
- SOCIETY OF CHEMICAL INDUSTRY (Newcastle Section) Annual General Meeting "Immunochemistry" Professor M Stacey, at King's College, Newcastle upon Tyne, at 6 30 p m
- MIDLAND CHEMISTS COMMITTEE (Society of Chemical Industry) Jubilee Memorial Lecture "Water—A National Asset" Mr H W Cremer, at The University, Edmund Street, Birmingham, at 6 30 p m
- INSTITUTION OF THE RUBBER INDUSTRY (Southern Section) Annual General Meeting At the Polygon Hotel, Southampton, at 7 15 p m
- PLASTICS INSTITUTE (Southern Section) "Protein Plastics" Mr J H Collins, at the Polygon Hotel, Southampton, at 7 30 p m
- 22 THE INSTITUTE (East Midlands Section) Annual General Meeting Molecular Association' Professor L Hunter, at The Technical College, Nottingham, at 7 15 p m
- THE INSTITUTE (London and South-Eastern Counties Section) The Chemistry of Packaging" Dr G L Riddell, at Medway Technical College, Gillingham, at 7 30 p m
- CHEMICAL SOCIETY Scientific Meeting In the Rooms of the Society, Burlington House, Piccadilly, London, W 1, at 7 30 p m
- BRITISH ASSOCIATION OF CHEMISTS (Liverpool Section) Annual Section Meeting At Bradford Hotel, Tithebarn Street, Liverpool, at 7 p m
- INSTITUTE OF PLASTICS (London and District Section) "Alginates" Mr C B Bonnikson, at the Waldorf Hotel, Aldwych, London, W C 2
- 24 THE INSTITUTE (London and South-Eastern Counties Section) "A Day in the Life of an Alkali Inspector, or The Control of Noxious or Offensive Gases" Mr W A Damon, C B E, at Brighton Technical College Brighton, at 5 45 p m
- THE INSTITUTE (Tees-side Section) "The Structure of Anti bodies and the Nature of Serological Reactions" Professor Linus Pauling, in the lounge, Norton Hall, Norton, Stockton-on-Tees, at 3 p m
- INSTITUTION OF CHEMICAL ENGINEERS (North-Western Branch) "Dust Explosions in Factories" Mr S H Wilkes, at the College of Technology, Manchester, at 3 p m
- 26 INSTITUTION OF THE RUBBER INDUSTRY (Manchester and District Section) Annual General Meeting and Social Evening, at the Engineers' Club, Albert Square, Manchester, 2, at 6 15 p m
- INSTITUTION OF THE RUBBER INDUSTRY (Midland Section) Annual General Meeting At the James Watt Memorial Institute, Great Charles Street, Birmingham, 3, at 7 15 p m

April

- 28 THE INSTITUTE (Belfast and District Section): Visit to the Linen Research Institute, Lambeg.
- 29 THE INSTITUTE (Manchester and District Section): Annual General Meeting. Lecture, "Terylene." Mr. J. R. Whinfield, at the Engineers' Club, Albert Square, Manchester, 2, at 7 p.m.
- 30 THE INSTITUTE (South Wales Section): Annual General Meeting.

May

- 1 THE INSTITUTE (London and South-Eastern Counties Section): May Day Social. At the Oak Restaurant, 18, Kensington High Street, London, W.8.
- 3 SOCIETY OF CHEMICAL INDUSTRY (London Section): "The Treatment and Disposal of Waste Waters from Industry." Dr. B. A. Southgate, in the Rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1, at 6.30 p.m.
- 4 SOCIETY OF CHEMICAL INDUSTRY (Chemical Engineering Group): "Recent Developments in Cast Iron." Mr. J. G. Pearce, in the Rooms of the Geological Society, Burlington House, Piccadilly, London, W.1, at 5.30 p.m.
- ELECTRODEPOSITORS' TECHNICAL SOCIETY: "Modern Nickel and Chromium Plating Practice." Mr. N. Christie, at the James Watt Memorial Institute, Great Charles Street, Birmingham, 3.
- 5 SOCIETY OF PUBLIC ANALYSTS AND OTHER ANALYTICAL CHEMISTS: Scientific Meeting in the Rooms of the Chemical Society, Burlington House, Piccadilly, London, W.1, at 7 p.m.
- MIDLAND CHEMISTS' COMMITTEE (THE INSTITUTE): At the Technical College, Coventry, at 7 p.m.
- 6 THE INSTITUTE (Sheffield, South Yorkshire and North Midlands Section): Annual General Meeting. In the Applied Science Department, The University, Sheffield, at 6 p.m.
- CHEMICAL SOCIETY: Reading of original papers. In the Rooms of the Society, Burlington House, Piccadilly, London, W.1, at 7.30 p.m.
- CHEMICAL SOCIETY: "The Chemical Bond." Professor L. R. Pauling, in the Chemistry Department, University of Manchester, at 6.30 p.m.
- 7 SOCIETY OF CHEMICAL INDUSTRY (Manchester Section): Visit to Messrs. Monsanto Chemicals, Ltd., Ruabon.
- 8 THE INSTITUTE (Mid-Southern Counties Section): Inaugural Meeting of the Section at the Civic Centre, Southampton, at 3 p.m.
- 10 MIDLAND CHEMISTS' COMMITTEE (BIRMINGHAM UNIVERSITY CHEMICAL SOCIETY): At the University, Edgbaston, Birmingham, at 4.30 p.m.
- THE INSTITUTE (Hull and District Section): Annual General Meeting. Lecture. Dr. H. J. T. Ellingham, at the Royal Station Hotel, Hull, at 7 p.m.
- INSTITUTE OF PETROLEUM (Northern Branch): Meeting at the Engineers' Club, Albert Square, Manchester, 2, at 6 p.m.
- 11 SOCIETY OF INSTRUMENT TECHNOLOGY (North-West Section): Annual General Meeting. "Pressure Gauges, with Special Reference to their Selection, Installation and Maintenance." Mr. C. F. Budenberg, M.C., at the College of Technology, Manchester, at 7.15 p.m.
- 12 INSTITUTE OF PETROLEUM: "The Chemical Evaluation of Oils of Medium Viscosity." Dr. C. H. Johnson, at Manson House, 26, Portland Place, London, W.1, at 5.30 p.m.
- 13 ROYAL PHOTOGRAPHIC SOCIETY (Scientific and Technical Group): Symposium on "Reversal Development." At 16, Prince's Gate, London, S.W.7, at 7 p.m.
- 14 MIDLAND CHEMISTS' COMMITTEE: "Observations on the Strength of Organic Acids." Dr. J. F. J. Dippy, at The University, Edmund Street, Birmingham, at 6.30 p.m.

May

- 20 CHEMICAL SOCIETY In the rooms of the Society, Burlington House, Piccadilly, London, W 1, at 7 30 p m
 INSTITUTION OF MINING AND METALLURGY General Meeting, in the Rooms of the Geological Society, Burlington House, Piccadilly, London, W 1, at 5 p m
- 22 SOCIETY OF CHEMICAL INDUSTRY (Agriculture Group) Annual General and Summer Meeting at the East Malling Research Station, Maidstone, Kent, at 12 noon
- NUTRITION SOCIETY Annual General Meeting, followed by Scientific Meeting
- 26 SOCIETY OF CHEMICAL INDUSTRY (Chemical Engineering Group) Annual General Meeting In the Rooms of the Geological Society, Burlington House Piccadilly, London, W 1, at 5 30 p m
- 28 THE INSTITUTE (Bristol and South-Western Counties Section) "Immunochemistry" Professor M Stacey, at Exeter
- 29 BIOCHEMICAL SOCIETY Meeting at Oxford

June

- 2 BRITISH ASSOCIATION OF CHEMISTS (London Section) "Emulsification and Detergency" Mr F Courtney Harwood, in Room 3, Gas Industries House 1, Grosvenor Place, London, S W 1, at 7 p m
- 3 CHEMICAL SOCIETY Meeting for the reading of original papers, in the Rooms of the Society, Burlington House, Piccadilly, London, W 1
- 8-11 INSTITUTION OF GAS ENGINEERS 85th Annual General Meeting, in the Large Hall Friends' House, Euston Road, London, N W 1
- 9 INSTITUTE OF PETROLEUM Meeting at Manson House, 26, Portland Place, London, W 1, at 5 30 p m
- 16 MIDLAND CHEMISTS' COMMITTEE "The Chemist as a Government Inspector" Mr E J Osborne at The University, Edmund Street, Birmingham, at 6 30 p m
- 19-23 INSTITUTION OF FIRE ENGINEERS Conference at Eastbourne

July

- 12-17 SOCIETY OF CHEMICAL INDUSTRY Annual General Meeting, at Edinburgh

ANNOUNCEMENTS**EXAMINATIONS**

Examinations will be held in **September, 1948**, as follows —

For the Associateship

In the week beginning **Monday, 13 September**, in **London and Glasgow**

Candidates who have not yet been accepted should obtain from the Registrar the prescribed form of application without delay, so as to leave ample time to secure thereon the necessary signatures certifying that they have complied with the Regulations concerning their courses of training. The completed application form must reach the Institute not later than **Monday, 7 June**. No application in respect of the September Examination will be considered if received later than that date.

Entry forms will be sent as soon as they are ready to all candidates who have been previously accepted and to those whose applications have been received as above.

The last date for the receipt of entry forms will be **Monday, 5 July**, after which no entry can be accepted.

For the Fellowship

In the week beginning **Monday, 20 September**, in **London**, or elsewhere at the discretion of the Council.

Last dates for application and for entry as for the Associateship, except that candidates who desire to present themselves for examination in a Special Branch of work must submit their entry forms before **Monday, 7 June**.

ANNIVERSARY MEETINGS, 1948

The Annual General Meeting of the Royal Institute of Chemistry will be held in Birmingham on 16 April, 1948, and in celebration of this event the Birmingham and Midlands Section has arranged an Exhibition and a series of meetings and social events. To mark the occasion, the Lord Mayor of Birmingham has expressed his intention to extend a civic welcome to the President of the Institute.

Thursday, 15 April

- 3 p.m. **Exhibition.** "The Chemist in the Midlands," to be opened by the President, at the Central Technical College. The Exhibition will remain open until 7.30 p.m.; on the two following days it will be open to the public at a charge of 1s. for adults, 6d. for children.
- 6 p.m. **Lecture on "The Chemical Research Laboratory, Teddington,"** by Dr. R. P. Linstead, C.B.E., M.A., D.Sc., F.R.I.C., F.R.S., at the University, Edmund Street.
- 8 p.m. Dinner given by the Committee of the Section in honour of the President and Council, at Queen's Hotel.

Friday, 16 April

- 11 a.m. **Lecture on "The New Fluorocarbon Chemistry,"** by Professor Maurice Stacey, D.Sc., F.R.I.C., at the Botanical Gardens.
- 1 p.m. **Anniversary Luncheon** at the Botanical Gardens. *Tickets 12s. 6d., available to Members only.*
- 3.30 p.m. **Annual General Meeting at the Botanical Gardens.** *Open to Fellows and Associates only (See accompanying notice and agenda).*
- 7.30 p.m. **Reception and Dance** at the Botanical Gardens. *Tickets 7s. 6d., available for Members and their friends.* Bus transport will be available at a small charge at 11.15 p.m. and after the Dance.

Saturday, 17 April

- 10 a.m. Conference of Hon. Secretaries of Local Sections, at the Chamber of Commerce.
- Visits. (a) The University and the Barber Institute of Fine Arts.
 (b) Messrs. Chance Bros.' Glassworks, Smethwick.
 (c) Messrs. Marston, Thompson & Evershed's Brewery, Burton-on-Trent.

Members and Students resident outside the Birmingham area should have made application for any tickets required for the above events to the Assistant Secretary of the Institute, 30, Russell Square, London, W.C.1, before 16 March. Enquiries about allocation of places or other matters not settled by 6 April should be addressed to Mr. E. M. Joiner, Hon. Secretary, Birmingham and Midlands Section, 15, Halton Road, Sutton Coldfield, Warwickshire.

SCIENTIFIC COURSES AND CONFERENCES

Particulars of the following have been received:—

Course on Biochemistry at Chelsea Polytechnic, London.—Part 2 of a course of twenty lectures on "Biochemistry," by Dr. G. A. D. Haslewood, on Mondays at 6.15 p.m., from 12 April to 21 June, 1948 (17 May excluded). The course meets the requirements of students who have a knowledge of Chemistry to degree standard and wish to acquire a knowledge of Biochemistry.

Further particulars and forms of application can be obtained from the Principal of the Polytechnic, Manresa Road, London, S.W.3.

Course of Post-Graduate Lectures on Chemistry at Acton Technical College.—The remaining lectures are:—

Four lectures on "Bacterial Chemistry," by Dr. H. N. Rydon, beginning 9 April, 1948. Six lectures on "Steroid Hormones," by Dr. C. W. Shoppee, beginning 7 May, 1948. Fee for each group of lectures, 10s.

Further particulars may be obtained from the Principal, Acton Technical College, High Street, Acton, London, W.3.

Course of Lectures on Newer Engineering Materials, at the Northampton Polytechnic, London.—The course began on 3 March, 1948. The remaining lectures are:—

Two lectures on "Plastics," by Mr. R. F. Phillips, on 14 and 21 April, at 7 p.m. Lecture on "Silicones," by Mr. P. A. Claret, on 28 April, at 7 p.m.

Fee for the Course, 10s. 6d.

For particulars apply to Northampton Polytechnic, St. John Street, London, E.C.1. Enrolment daily at the Polytechnic office, 10 a.m. to 7 p.m.

Course of Lectures on Trade Marks at the Sir John Cass Technical Institute—Four lectures by Mr Eric Walker on Tuesday evenings, 6-7 30 p m , beginning on 13 April fee 5s Applications should be made to the Principal of the Institute, Jewry Street, Aldgate, London, E C 3

Post graduate Course at Bradford Technical College—A post graduate course in High Polymer Chemistry will be held in the Bradford Technical College during the summer term The course, which will consist of 10 lectures, will be held on Wednesday evenings at 7 p m , commencing on Wednesday, 12 May, 1948

Further particulars of the course may be obtained from the Principal, Technical College, Bradford

The Faraday Society A General Discussion on "The Physical Chemistry of Process Metallurgy" will be held in the latter half of September, 1948

It is intended that the discussion should be devoted to the thermodynamics and kinetics of the high temperature reactions involved in smelting and refining It is proposed to exclude reactions occurring in mechanical working and heat treatment, and also electrochemical processes in aqueous solutions

Authors whose proposed papers have been accepted should send in their complete papers by 1 July, 1948

Summer School in Chemistry at University College, Dublin—A Summer School in Chemistry, under the auspices of the Irish Chemical Association, will be held in the Department of Chemistry, University College, Dublin, from 5 to 9 July, 1948

A course of five lectures will be given in each of the following subjects —

1 "Some Recent Advances in Chemotherapy," by Dr V C Barry

2 "Recent Advances in the Determination of the Structure of Organic Compounds," by Professor W Cocker

3 "Recent Advances in Biochemistry," by Professor E J Conway, F R S

4 "The Electronic Theory in Chemistry," by Professor T S Wheeler

One lecture in each subject will be given every day, the first being at 10 a m on Monday, 5 July

Further particulars may be obtained from the Hon Secretary, Cumann Ceimicidhe na h Eireann, The Laboratory, 12, Dawson Street, Dublin

Cambridge Summer School in Metal Physics—The School will be held from 23 August to 3 September in the Cavendish Laboratory, Cambridge, and will provide research workers with an introduction to the application of physical methods to the examination and utilisation of metals Application forms must be obtained from and returned before 1 June to Mr G F Hickson, M A , Secretary of the Board of Extra-Mural Studies, Stuart House, Cambridge

Summer School in X Ray Crystallography at Manchester College of Technology—A summer school in X-Ray Crystallography will be held from 6 to 17 September, 1948, in the Physics Department of the Manchester College of Technology, under the direction of Dr H Lipson The course is designed to meet the needs of those who wish to make use of X-Ray diffraction in both industrial and academic research, but who have not had opportunity to acquire the basic training

Further details may be obtained from the Director of Extra-Mural Studies, The University, Manchester, 13

THE ROYAL SOCIETY SCIENTIFIC INFORMATION CONFERENCE

Arising out of the Royal Society Empire Scientific Conference and the British Commonwealth Scientific Official Conference the Council of the Royal Society has decided to arrange a Conference on Scientific Information Services The Conference will take place from 21 June to 2 July, 1948, in London and will be attended by representatives of countries providing information services in English, namely the countries of the British Commonwealth and the United States of America

The Conference, which will consider information services from the point of view of the scientific user, will meet in four sections (1) Publication and Distribution of Papers reporting Original Work, (2) Abstracting Services, (3) Indexing and other Library Services (4) Reviews, Annual Reports, etc In scope it is proposed to include all scientific subjects including the agricultural, medical and engineering sciences

Invitations to the Conference are being issued by the Royal Society and admission will be by ticket only, but organisations and individuals interested can make application for tickets, in writing, to the Assistant Secretary, The Royal Society, Burlington House, London, W 1, before 1 June, 1948

PREVENTION OF ACCIDENTS

Safety Rules for Use in Chemical Works.—The Association of British Chemical Manufacturers has issued a new edition of "Safety Rules for use in Chemical Works, Part I. Model Rules," and has generously agreed to enable the Institute to obtain a limited number of copies for sale to members of the Institute at the special reduced price of 3s. 6d. Members of the Institute who desire to obtain a copy of this publication under these favourable conditions are asked to make application to the Records Officer, The Royal Institute of Chemistry, 30, Russell Square, London, W.C.1, with remittance for 3s. 6d.

Origins and Prevention of Laboratory Accidents.—With reference to the announcement in JOURNAL AND PROCEEDINGS, 1948, I, 43, it has been decided to postpone the proposed discussion until later in the year, probably October. It is intended to arrange for papers on various aspects of the subject to be presented and discussed and for the proceedings of the meeting to form the basis of an authoritative publication.

MISCELLANEOUS

International Study of Rheology.—The First International Rheological Congress, organised by a Dutch Committee, will be held at Scheveningen (near The Hague) from 21 to 25 September, 1948. Those intending to present papers should communicate with the principal secretary, Dr. R. Houwink, Rubber-Stichting, Julianalaan 134, Delft, Holland. Manuscripts (limited to 3,000 words) must be received before 1 May, 1948. The Congress fee will be about £1. 8s.

The Joint Committee on Rheology of the International Council of Scientific Unions will hold a meeting during the Congress.

Chemical Society Research Fund.—The Council of the Society will award grants from the Fund in June. Applications, to be made on forms obtainable from the General Secretary, The Chemical Society, Burlington House, Piccadilly, London, W.1, must be received on or before 10 May. Applications from Fellows of the Society will receive prior consideration.

Ramsay Memorial Fellowships for Chemical Research.—The trustees will consider in June, 1948, applications for Ramsay Memorial Fellowships for chemical research, one of which will be limited to candidates educated in Glasgow. Full particulars can be obtained from the Joint Honorary Secretaries, Ramsay Memorial Fellowships Trust, University College London, Gower Street, London, W.C.1, to whom applications must be forwarded not later than 17 April.

Research Studentships and Exhibitions.—Trinity College, Cambridge, offers research studentships and Dominion and Colonial exhibitions every year, and elections will take place in July, 1948. Research studentships are open to graduates of universities other than Cambridge who are not more than twenty-six years of age. The exhibitions are open to undergraduates as well as those wishing to undertake research. Applications, to be sent through the head of the candidate's university, must reach the Senior Tutor, Trinity College, Cambridge, not later than 1 May, 1948.

Imperial Chemical Industries Research Fellowships.—Applications are invited for Research Fellowships, normally of the value of £600 per annum, founded by Imperial Chemical Industries, Ltd., tenable in the University of Cambridge and available for research in physics, chemistry, biochemistry, engineering, metallurgy, pharmacology, chemotherapy, or related subjects. Regulations governing the award of the Fellowships may be obtained from the Secretary of the Board of Research Studies, The Old Schools, Cambridge, to whom all applications should be addressed not later than 30 April.

U.S. National Research Council Fellowships.—The U.S. National Research Council is again offering a number of fellowships for advanced study and research in the natural sciences. Particulars can be obtained from the National Research Council Fellowship Office, National Research Council, 2101, Constitution Avenue, N.W., Washington 25, D.C.

Boots' Booklovers Library.—Members are reminded that the subscription arranged for Fellows and Associates expired on 1 March, 1948, and fresh application forms should have been completed by those members who desire to continue for a further year's service. The new rates are:—

Class "A": 22s. 6d. per volume for 12 months (against 25s. to the general public).
 Class "B": 10s. 6d. per volume for 12 months (against 12s. 6d. to the general public).
 Forms may be obtained from the Records Officer of the Institute.

GENERAL NOTICES

(*For notices relating to matters of immediate importance see "Announcements" on p 128*)

Notice to Associates—Regulations and forms of application for the Fellowship can be obtained from the Registrar

Appointments Register—A Register of Fellows and Associates who are available for appointments, or are desirous of extending their opportunities, is kept at the offices of the Institute. Prospective employers and Fellows and Associates who desire to make use of this service as a means of obtaining employment should communicate with the Registrar

Libraries—The comprehensive Library of the Chemical Society, Burlington House, Piccadilly, W 1, to the maintenance of which the Institute makes substantial contributions, is available to Fellows, Associates and Registered Students wishing to consult or borrow books, from 10 a m to 9 p m on week-days (except Saturdays 10 a m to 5 p m). Books can also be borrowed by post

Books may be borrowed from the Science Library, Science Museum, South Kensington, S W 7, on production of requisitions signed by the Registrar or the Secretary of the Institute

The Library of the Institute is open to Fellows, Associates and Registered Students from 10 a m to 5 p m on week-day (not including Saturdays)

Lantern Slides for Lecturers—A list of slides of portraits of great chemists and other scientists throughout the ages can be obtained on application to the Secretary. As the slides are frequently in demand, members are requested to notify their requirements at least 14 days before the date on which the slides are to be used

Joint Subscription Arrangements—Fellows, Associates and Registered Students who wish to participate in the arrangements whereby they can acquire on favourable terms membership of the Chemical Society, the Society of Chemical Industry and the Faraday Society or the Society of Public Analysts and Other Analytical Chemists, with substantial privileges as to publications (see special article, JOURNAL AND PROCEEDINGS, 1945, Part IV, p 148), can obtain further particulars and necessary forms from the Conjoint Chemical Office, 9 and 10, Savile Row, London, W 1

Benevolent Fund—Contributions for 1948 may be sent to the Honorary Treasurer, 30, Russell Square, London, W C 1. Forms for Deeds of Covenant may be obtained from the Secretary

Covers for the Journal—Members who desire covers (2s each) for binding the JOURNAL AND PROCEEDINGS in annual volumes should notify the Assistant Secretary of their requirements, indicating the years (1946 or earlier) required

Service with H M Forces—Fellows, Associates and Registered Students who are on service with the Navy, Army and Air Force are requested to notify the Institute, giving particulars as to their rank, unit, etc

Changes of Address—Fellows, Associates and Registered Students who wish to notify changes of address are requested to give, so far as possible, their permanent addresses for registration. When writing from an address different from that previously given they are requested to state if the new address is to be used in future and whether the change affects the Appointments Register. All requests for changes should be addressed to the Registrar, and not to the Honorary Secretaries of Local Sections

In order to facilitate identification, Fellows, Associates and Registered Students are asked to give their full initials on communications addressed to the Institute. In the prevailing circumstances they are also asked not invariably to expect formal acknowledgments of communications addressed to the Institute unless replies are necessary