PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, January 16th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

After welcoming the visitors who were present, the PRESIDENT stated that he had the pleasant duty to perform of calling upon Mr. Ayerst Henham Hooker, F.I.C., who had intimated to the Council his desire to present a Silver Mace to the Society to commemorate his attaining his jubilee as a Fellow.

Mr. Hooker stated that after spending nearly fifty years abroad, he had been surprised and gratified to receive shortly after his return to this country a letter from the Council congratulating him on completing his fiftieth year of Fellowship. He had sought some means by which he could manifest his appreciation of the important work accomplished by the Society; chancing to meet Professor Thorpe in his club, he had inquired of him if a Silver Mace would be an acceptable gift, and had been delighted to learn subsequently that his suggestion had been favourably received by the Council. In conclusion, Mr. Hooker said : " And now, Sir, I have the honour to salute you and to ask you on behalf of this distinguished Society to accept from my hands ' This Mace ' as an emblem of the authority you so worthily exercise in directing the activities and presiding over the deliberations of this great Society."

In expressing to Mr. Hooker the sincere thanks of the Society for his generous gift, the PRESIDENT stated that the Mace would add to the dignity of the Society and was an appropriate gift in this the ninetieth year of its existence. He mentioned that Mr. Hooker had spent forty-nine years in Egypt, commencing his career there as Chemist in the Customs Administration in 1878. In 1882, Mr. Hooker witnessed the bombardment of Alexandria as Correspondent for the *New York Herald* and the *Morning Post* and was awarded the Medal and Star; from 1883 to 1890 he was engaged in work of great national importance, especially in connexion with the cholera epidemic, for which he obtained the Queen's Gold Medal for Gallantry

and Humanity. In 1891 Mr. Hooker was appointed Director-General of the Salt Monopoly, and when this monopoly was made over to the Egyptian Salt and Soda Company, he became its General Manager. Mr. Hooker left the Khedivial Government's service in 1902, and from 1905 to 1923 was Consul for Norway, receiving the 1st Class Knighthood of St. Olaf. For his services in Egypt Mr. Hooker received the special thanks of Lord Cromer; was promoted to the 2nd Class of the Order of Medjidieh and to the 2nd Class of the Order of Osmanieh, which carries with it the title of Pasha."

"Emergency Hooker," as he was called, because he was always available to Lord Cromer in any emergency, left Egypt in 1926. After his retirement from office, Mr. Hooker devoted his time and energies to the study and development of the country which he had made his home for so many years. Here he endeared himself to all who knew him, and left a record of which he may well be proud.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	*Died.*
William Duncan (Edinburgh) ...	Dec. 3rd, 1896.	Sept. 16th, 1929.
Francis Salsbury Earp	Dec. 1st, 1876.	
Mona Elizabeth Eck	Dec. 2nd, 1926.	Dec. 29th, 1929.
Alfred Edwin Gates	Dec. 5th, 1918.	Oct. 15th, 1929.
John Petty Leather	Dec. 4th, 1902.	Dec. 24th, 1929.
William Frederick Oakfield	June 15th, 1899.	May 19th, 1929.

It was announced, in accordance with the Bye-Laws, that the Members of Council who retire at the Annual General Meeting on March 27th, 1930, are:

President: Prof. J. F. THORPE.

and the following who are not eligible for re-election to the same office until after the lapse of one year:

Vice-President who has filled the Office of President: Prof. H. B. DIXON.

Vice-Presidents who have not filled the Office of President: Prof. G. G. HENDERSON, Prof. A. SMITHELLS.

Ordinary Members of Council:

(*a*) Town Members:

Mr. E. R. BOLTON, Prof. J. C. DRUMMOND, Prof. J. F. SPENCER.

(*b*) Country Members:

Mr. M. P. APPLEBEY, Prof. J. E. COATES, Dr. E. K. RIDEAL.

The following vacant places fall due to be filled at the next Annual General Meeting, in accordance with the Bye-Laws :

President : One vacancy.

Vice-Presidents who have filled the office of President : Two vacancies.

Vice-Presidents who have not filled the office of President : Two vacancies.

Ordinary Members of Council :

(*a*) Town Members (*i.e.* those living within a radius of 50 miles from Charing Cross) : Three vacancies.

(*b*) Country Members (*i.e.* those living beyond a radius of 50 miles from Charing Cross) : Three vacancies.

With respect to the office of President, the Council is of the opinion that owing to the exceptional circumstances arising from the scheme which is about to be launched for the provision of a Central Building to house the Chemical, Mining, and Metallurgical Institutions of the country, everything should be done to maintain uniformity and continuity of effort in the prosecution of the campaign. It considers, therefore, that a change in the office of President this year would be unwise and not in the best interests of the Society. The Council accordingly passed the following resolution on December 19th, 1929, and confirmed it on January 16th, 1930 :

> "That in view of the very important part which Professor J. F. Thorpe has, as President of the Chemical Society, been taking in relation to the scheme for re-housing the Society, and having regard (1) to the importance to the Society of his continuing to represent the Society in the proceedings above referred to with the authority attaching to the office of President, (2) to the continued and probably increased responsibility that will fall upon the representative of the Chemical Society in the further development of the housing scheme, the Council is strongly of opinion that the continuation of Professor Thorpe for another term in the office of President is highly desirable."

The PRESIDENT consented to accept nomination if it were understood that he is at liberty to place his resignation in the hands of the Council after the termination of the first year of the new period of office.

The PRESIDENT read the following section from Bye-Law VI dealing with the manner of nomination for any vacancy among the Officers, Vice-Presidents, or Ordinary Members of Council :

> A nomination for any vacancy among the Officers, Vice-Presidents, or Ordinary Members of Council may be made in

writing signed by at least twenty Fellows, and must be received by the Secretaries at the Society's Rooms not later than the fourteenth day of February. Every nomination must relate to one vacant place only and must be accompanied by a signed declaration by the nominee that he is willing to accept office if elected. Nominations may be made also by the Council.

The following announcements were also made :

1. The Council has resolved to award the Longstaff Medal for 1930 to Dr. William Hobson Mills, F.R.S., of Cambridge, for his distinguished researches in Organic Chemistry especially in its relation to Stereochemistry. The presentation of the medal will be made at the Annual General Meeting on March 27th.
2. Fellows are reminded of the special terms on which they may become subscribers to the Collective Index, 1923—1932, and are urged to send in their applications without delay. The prompt and extensive support of the Fellows is earnestly desired in order that the preparation of the Index may be undertaken at an early date.

The following were formally admitted Fellows of the Chemical Society : D. W. Powell, H. C. Baker, H. H. Hatt, John Farquharson, Arthur W. Morgan, S. E. Boxer, C. R. Wright, E. J. Miller, and Fredk. T. Trustrum.

Forms of Recommendation for Fellowship were read for the first time in favour of :

Hubert Vernon Bettley-Cooke, The Hollies, Minter Street, Canterbury, N.S.W.
Guy Drummond Greville, B.A., Kaye, Woodcote Lane, Purley.
Lena Halpern, A.M., 97, Greencroft Gardens, N.W. 6.
Frank Edward Joselin, B.Sc., A.I.C., Achimota College, P.O. Box 394, Accra, Gold Coast.
Arthur Stuart Clark Lawrence, 41, Halifax Road, Cambridge.
Albert Leonard Lovecy, B.Sc., 37, Tilton Street, Fulham, S.W. 6.
Arthur Kelman Mills, Ph.D., Colliston Manse, Arbroath, Scotland.
Harvey Richard Lyle Streight, M.A., 61, Selly Park Road, Selly Park, Birmingham.
Michael Waloff, 214, Meadvale Road, Ealing, W. 5.

The following Forms of Recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2) :

Karl Merck, Goethestrasse 44, Darmstadt, Germany.
Narendranath Mittra, M.Sc., 90, Hewett Road, Allahabad, India
Horace Hall Selby, 3787, California Street, San Diego, California.

The following papers were read :

" The heats of association of acetic and heptoic acids in the vapour state." By MISS T. E. FENTON and W. E. GARNER.

" The variation of phenol coefficients in homologous series of phenols." By C. E. COULTHARD, J. MARSHALL, and F. L. PYMAN.

" 10-Chloro-5 : 10-dihydrophenarsazine and its derivatives. Part XII. Additional experiments on the synthesis of the 1- and 3-methyl derivatives." By C. S. GIBSON and J. D. A. JOHNSON.

" Properties of conjugated compounds. Part IX. The formation of bimolecular reduction products of butadiene acids." By C. M. CAWLEY, J. T. EVANS, and E. H. FARMER.

" The isomerism of the butylideneacetones." By E. N. ECCOTT and R. P. LINSTEAD.

HUGO MULLER LECTURE.

The Hugo Muller Lecture will be delivered by Professor G. von Hevesy on Wednesday, March 26th, 1930 (the day before the Annual General Meeting and Anniversary Dinner). The title of the lecture will be " The Chemistry and Geochemistry of the Titanium Group."

Further particulars will be announced later.

THE 89TH ANNUAL GENERAL MEETING AND ANNIVERSARY DINNER.

The 89th Annual General Meeting will be held on Thursday, March 27th, 1930, at 4 p.m., and the Anniversary Dinner will take place the same evening at the Hotel Victoria, Northumberland Avenue. Further particulars will be circulated later.

JOURNAL OF PHYSICAL CHEMISTRY.

Subscription to the *Journal of Physical Chemistry* for 1930 should be sent to Mr. W. W. Buffum, *The Journal of Physical Chemistry*, 654, Madison Avenue, New York City, U.S.A., instead of to the Baker Laboratory of Chemistry, Ithaca, New York, U.S.A.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS FIFTIETH ANNIVERSARY CELEBRATIONS.

The celebrations of the Fiftieth Anniversary of the American Society of Mechanical Engineers will be held in New York City, Hoboken, and Washington, from April 5th to 9th, 1930. Fellows of the Society resident in the vicinity are invited to attend the meetings and those desiring to do so should notify the Secretary, 29, West Thirty-ninth Street, New York City, U.S.A.

List of papers, or abstracts thereof, received between December 19th, 1929, and January 16th, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting, or which have appeared in the Journal.)

" Mobile anion tautomerism. Part IV. The stability of some α- and γ-alkylallyl alcohols and their esters. 2 : 4-Dimethyl-cinnamyl alcohol." By H. BURTON.

" The properties of the chlorides of sulphur. Part III. Dielectric constants." By T. M. LOWRY and G. JESSOP.

" The properties of the chlorides of sulphur. Part IV. Density and surface tension." By T. M. LOWRY and G. JESSOP.

" The 3-halogeno-6-nitro- and the 3-halogeno-6-amino-dimethyl-anilines." By H. H. HODGSON and A. KERSHAW.

" 4-Sulpho 3-hydroxybenzoic acid." By M. S. SHAH.

" Some trinitroethylbenzenes." By J. N. E. DAY.

" Colloidal phenoxides. Part II. Some phenanthraxanthones." By W. BAKER.

" Synthesis of alkyl naphthalenes. Part I. 1-Methyl-7-ethyl-naphthalenes." By J. HARVEY, I. M. HEILBRON, and D. G. WILKINSON, and " Part II. 1-Methyl-6-ethylnaphthalene and 1-methyl-5-ethylnaphthalene." By I. M. HEILBRON and D. G. WILKINSON.

" *N*-Acylpyrazolones as acylating agents." By J. S. AGGARWAL and J. N. RAY.

" The photochemical interaction of acetaldehyde and oxygen." By E. J. BOWEN and E. L. TIETZ.

" Photomicrographic methods applied to two-component salt mixtures." By W. M. MADGIN.

" The catalytic hydrogenation of different types of unsaturated compounds. Part V. The hydrogenation of cyclic ethylenic derivatives and of their mixtures." By S. V. LEBEDEV and M. PLATONOV.

"Extinction of methane flames by water vapour." By H. F. COWARD and J. J. GLEADALL.

"The polarity of acid chlorides." By W. J. DEVERALL and H. W. WEBB.

"Some chemical properties of aluminium." By N. F. BUDGEN.

"Investigations on the bivalency of carbon. Part III. Some experiments on xanthhydrol, dixanthhydryl ether, and xanthhydryl chloride." By F. G. KNY-JONES and A. N. WARD.

"The unsaturation and tautomeric mobility of heterocyclic derivatives. Part II. The aromatic nature of the heterocyclic nucleus in α-naphthathiazole and the synthesis of a derivative of γ-naphthathiazole." By R. F. HUNTER and J. W. T. JONES.

FORMS OF RECOMMENDATION FOR FELLOWSHIP. THE BALLOT WILL BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, FEBRUARY 20th, 1930.

ANDERSON, JOHN STUART, 42, Grosvenor Road, Highbury, N. 5. British. B.Sc., A.R.C.S., D.I.C. (Imperial College of Science, London). Research Student. (*Signed by*) H. B. Baker, A. A. Eldridge, R. H. Purcell.

BETTLEY-COOKE, HUBERT VERNON, "The Hollies," Minter Street, Canterbury, N.S.W., Australia. British. Chemist. Associate Australian Chemical Institute. Senior Chemist Dyes & Chemicals, Ltd., agents for I.G. Farbinindustrie. (*Signed by*) A. D. Ollé, R. Grant, R. W. Challinor.

BRECHIN, THOMAS STEWART, c/o Miller & Co., Chemists, Kandy, Ceylon. British. Dispensing Chemist. Pharmaceutical Chemist, England. Examination passed, April 7th, 1909. Certificate No. 17534. (*Signed by*) Wm. H. Saunders, George Dalrymple, H. Humphreys Jones, J. W. Clayton.

CHEESMAN, GEOFFREY HERBERT, 9, Compton Road, Wimbledon, S.W. 19. British. B.Sc. (Lond.); A.R.C.S. (*Signed by*) H. B. Baker, James C. Philip, H. L. Riley.

COLLIER, KATHLEEN MARY, 85, Worple Road, Wimbledon, S.W. 19. British. Assistant Science Mistress at Bedford High School. At present a Postgraduate Student at Imperial College of Science and Technology. (*Signed by*) M. A. Whiteley, James C. Philip, H. L. Riley.

CORDINGLEY, HAROLD, Hawksworth Avenue, Guiseley, nr. Leeds. British. Research Student. B.Sc. (Leeds), Hons. Chem. (*Signed by*) C. K. Ingold, J. W. Baker, H. Burton.

COSTIGAN, HOWARD AUGUSTUS, 280, Wellington Road North, Heaton Chapel, Stockport. English. Head of Department (Chemistry and Physics), Stockport College. B.Sc., 1st Class Hons., 1st Division, School of Chemistry, July 1922; Ph.D. (Liverpool University). Two years' research under Prof. Baly, F.R.S., on "Refractive Index and Chemical Constitution," Dec. 1924. Hon. Scholar, Liverpool University, 1922. Teacher in Primary, Secondary, and Technical Schools during the past eighteen years. Now Lecturer, with duties of Head of Department, in Chem. and Physics, at Stockport College, appointed as from Sept. 1, 1927. Desirous of keeping in touch, conveniently, with developments in chemistry, and of availing myself of the Society's facilities. (*Signed by*) R. A. Morton, R. O. Griffith, A. McKeown.

DAVIES, JOHN MALCOLM, 33, Boverton Street, Cardiff, S. Wales. British. Acting Head, Department of Pharmaceutics, Cardiff Technical College. Pharmaceutical Chemist. Lecturer in Pharmacy and Pharmaceutical Chemistry. (*Signed by*) F. W. Hodges, E. A. W. Hebdon, Ernest A. Rudge.

DOJA, MOHAMMAD QAMRUD, Doja Buildings, P.O. Bankipore, Patna, India. Indian. Research Student. B.A. (Cambridge); B.Sc. (Patna). (*Signed by*) W. J. Pope, W. H. Mills, R. G. W. Norrish.

ELLIS, CECIL PHILIP, School for Sons of Chiefs, Bo, Protectorate of Sierra Leone, West Africa. British. Teaching (Colonial Civil Service). B.Sc. London (2nd Class Hons. Chem.); A.I.C. Science Master, Bo School, Sierra Leone. (*Signed by*) S. Sugden, George W. Ferguson, W. Solomon.

FISHER, NELLIE IVY, 127, Wellesley Road, Ilford, E. British. Research Chemist. A.R.C.S.; B.Sc., Imperial College of Science and Technology, South Kensington. Student at the Imperial College of Science and Technology (one year's research). Research Assistant to Dr. F. M. Hamer at the Research Laboratories of the Photographic Plates & Papers, Ltd. Riley and Fisher, *J.C.S.*, 1929, 2006. (*Signed by*) H. L. Riley, F. M. Hamer, H. Baines.

FRASER, HUGH BOUVARD, 32, Lansdowne Crescent, Holland Park, London, W. 11. British. Research Student. B.Sc. (Edinburgh). Organic Chemistry Research at the Imperial College of Science and Technology, South Kensington. (*Signed by*) Jocelyn Thorpe, G. A. R. Kon, R. P. Linstead.

FUSEYA, GIICHIRO, Kogakubu, Tohoku Imperial University, Sendai, Japan. Japanese. Professor of Applied Electrochemistry, Tohoku Imperial University. Publication: "The Common Properties of Addition Agents in Electrodeposition," *Trans. Amer. Electrochem. Soc.*, 1926; "Addition Agents in Electrodeposition, II," *ibid.*, 1927. (*Signed by*) Riko Magima, Hiroshi Nomura, Sin-iti Kawai.

GADDIE, ROBERT, "Laguna," Eskbank, Dalkeith, Midlothian. Scottish. Assistant in the Dept. of Therapeutics, University of Edinburgh. B.Sc., Edinburgh. I am at present carrying out research and wish to keep in touch with the developments in chemistry. (*Signed by*) George Barger, C. P. Stewart, Edgar Stedman.

GREVILLE, GUY DRUMMOND, Kaye, Woodcote Lane, Purley, Surrey. British. Analytical and Research Chemist, Crookes' Laboratories. B.A. (Cantab.), Parts I and II, Natural Sciences Tripos (1st Class). (*Signed by*) Frank Dickens, Wilfrid Lawson, H. E. F. Notton.

HALPERN, LENA, 97, Greencroft Gardens, N.W. 6. American. Student (Research). A.B., Hunter College, New York City; A.M., Columbia University, N.Y.C. 1926–1929, Research Assistant, N.Y. Post-Graduate Medical School and Hospital. (*Signed by*) F. G. Donnan, K. N. Menon, K. R. Krishnaswami.

HEWSON, GEORGE CHRISTOPHER, Arran Street, Ballina, Co. Mayo. British. Pharmaceutical Chemist. L.P.S.I. (1st place honours in all subjects). Examiner to the Pharmaceutical Society of Ireland in Botany and Materia Medica. (*Signed by*) G. Clifford Riley, Ian C. P. Smith, P. J. Thompson.

HEY, LESLIE, 11, Sholebroke Place, Chapeltown, Leeds. British. Research Student. B.Sc. (Chem. Hons., 2nd Class), Leeds. (*Signed by*) C. K. Ingold, H. Burton, J. W. Baker.

HUNTER, JOHN, 17, Brunswick Road, Withington, Manchester. British. Teacher. B.Sc. (London); A.I.C. Science Master, South Manchester School. Joint author of paper on "The Reaction between Bromine and Sodium Formate in Aqueous Solution" in School Science Review, December 1929. At present engaged in research on Ternary Liquid Mixtures. Some-

time Research Assistant and Assistant Works Chemist for Messrs. Spencer, Chapman & Messel, Ltd., Silvertown, E. (*Signed by*) J. R. Partington, A. Robertson, D. C. Jones, John K. Wood.

JOSELIN, FRANK EDWARD, 86, Pendle Road, Streatham, S.W. 16. British. Science Master, Achimota College, Gold Coast. B.Sc., London. Associate of the Institute of Chemistry. Associate of the City and Guilds, Finsbury College. From 1925 to Dec. 31, 1929, Chemist to the British Electrical Federation, Ltd. (*Signed by*) R. Leslie Collett, George Senter, Samuel Sugden.

KONDO, HEIZABURO, Pharmaceutical Institute, Imperial University, Tokio. Japanese. Professor of Chemistry. Professor Kondo has made many contributions to the original literature and is distinguished as teacher and investigator. (*Signed by*) Robert Robinson, S. Sugasawa, O. L. Brady.

LAMONT, FRANCIS GEORGE, 81, St. George's Road, Victoria, S.W. 1. British. Research Student at Royal College of Science. B.Sc. (Hons.) and M.Sc., Queen's University, Belfast. (*Signed by*) C. S. Gibson, John D. Johnson, William A. Bone.

LAWRENCE, ARTHUR STUART CLARK, 41, Halifax Road, Cambridge. English. Chemist. Research worker, Dept. of Physical Chemistry, Cambridge. Formerly Junior Chemical Assistant at the Royal Institution to the late Sir James Dewar and to Sir William Bragg. Author of " Soap Films " (Bell, 1929). Paper on " Soap Films and Colloidal Behaviour " in *J. Phys. Chem.*, in press; also one on " Separation of Soaps from Solution " in *Kolloid Zeitschrift*, in press. (*Signed by*) Henry E. Armstrong, W. H. Bragg, Eric K. Rideal.

LETON, ERNEST, 60, Brondesbury Park, N.W. 6. British. Research Student. Diplôme d'Ingénieur-Chimiste, University of Lausanne, Switzerland. Organic Chemistry Research at the Imperial College of Science, South Kensington. (*Signed by*) Jocelyn Thorpe, G. A. R. Kon, R. P. Linstead.

LOVECY, ALBERT LEONARD, 37, Tilton Street, Fulham, S.W. 6. British. Research Chemist. B.Sc., University of London. Employed at Research Department, Royal Arsenal, Woolwich. Late student at University College, London. (*Signed by*) W. W. Jones, T. E. Ellison, P. W. B. Harrison.

MILLS, ARTHUR KELMAN, Colliston Manse, Arbroath, Scotland. Scottish. Rockefeller Research Fellow. B.Sc., Ph.D. (St. Andrews). Carnegie Scholar, 1927–29. Rockefeller Research Fellow, 1929. Publications : *Ber.*, 1929, **62**, 284, 1784. (*Signed by*) Alex. McKenzie, Isobel A. Smith, Robert Roger, John D. M. Ross.

MILLS, JAMES EDWARD, 164, Willesden Lane, N.W. 6. British. Research Student at University College. M.Sc. (Queensland University). 1851 Exhibition Research Scholarship. (*Signed by*) F. G. Donnan, S. Barratt, W. Rogie Angus.

MORISON, CECIL GRAHAM TRAQUAIR, Pinsgrove, Hinksey Hill, Oxford. British. University Reader in Agricultural Chemistry. Student of Christ Church, Oxford. M.A. (Oxon.). (*Signed by*) N. V. Sidgwick, R. T. Lattey, E. Hope, Frederick M. Brewer, C. J. Virden, D. Ll. Hammick.

MOSALLAM, SAYED, Sedfa, Eldwair, Egypt. Egyptian. Chemistry Lecturer, Egyptian University, Cairo. B.Sc. (Hons.), Manchester, 1926. (*Signed by*) R. S. Cahn, D. H. Bangham, A. I. Kahîl, A. K. Wahbi.

ODELL, MARJORIE WINIFRED, 67, Marlowes, Hemel Hempstead, Herts. British. Chemistry Mistress at Barr's Hill School, Coventry. B.Sc. and A.R.C.S., Royal College of Science. (*Signed by*) Jocelyn Thorpe, M. A. Whiteley, R. P. Linstead.

PRAAGH, GORDON VAN, 15, Langland Gardens, Hampstead, N.W. 3. British. Research Student, Laboratory of Physical Chemistry, Cambridge. B.Sc., London. Graduated University of London, 1st Class Honours, 1928, Session 1928–29. Engaged in Research at University College, London, and at present at Laboratory of Physical Chemistry, Cambridge. (*Signed by*) T. M. Lowry, Eric K. Rideal, Gwyn Williams.

RAMSDEN, ELSIE, Lyddon Hall, Virginia Road, Leeds. English. Research Student. B.Sc., Hons. Chemistry, Leeds. Research Student in the University of Leeds. (*Signed by*) H. Burton, C. K. Ingold, C. W. Shoppee.

ROBERTSON, GEORGE ALEXANDER, 146, Holland Street, Glasgow. British. Research Chemist. Since qualifying ten years ago, I have been employed mainly on research. (*Signed by*) R. S. Cahill, S. Ellingworth, Henry Worth.

ROBINSON, EDMUND BRODIE, "Van Ryn," Glencroft Terrace, Darlington. British. Teacher. B.Sc., Sp. (Lond.), A.I.C. Student, four years' Honours Chemistry Course. Teacher, Day and Night School. Desire to keep in touch with the advance of Chemistry. (*Signed by*) G. R. Clemo, Richard Raper, P. L. Robinson, R. D. Haworth, L. A. Sayce.

SCHALIT, ROSA, 41, Eton Avenue, N.W. 3. British. Student. A.R.C.S., B.Sc., at Royal College of Science. To obtain the Society's publications and to attend the meetings. (*Signed by*) Jocelyn Thorpe, M. A. Whiteley, R. P. Linstead.

SHEPHERD, FLORENCE MARY ELLALINE, 54, Craignair Road, Tulse Hill, S.W. 2. British. Assistant Research Chemist. B.Sc., Chemistry Honours (London), Class I; M.Sc., Chemistry (London). Assistant Lecturer and Demonstrator in Chemistry, Royal Holloway College, 1925–28. Junior Assistant Chemist at H.M. Fuel Research Station, 1928–. (*Signed by*) A. B. Manning, T. S. Moore, M. Boyle.

STREIGHT, HARVEY RICHARD LYLE, 61, Selly Park Road, Selly Park, Birmingham, England. Canadian (British). Student. B.A., 1927 (with First Class Honours); M.A., 1929; both at University of British Columbia, Vancouver, Canada. Investigator: "The Electrolysis of Cyanogen Halides," R. H. Clark and H. R. L. Streight, *Trans. Roy. Soc. Canada*, 3, XXII, 323, 1928. Investigator and Author: "Cathodic Halogen—Electrolysis of Halogenyl Amides," Streight and Hallonguist, *J. Amer. Electro. Chem. Soc.*, 1929. Investigator: "A Systematic Study of the Preparation of Alkyl Chlorides," Clark and Streight, *Trans. Roy. Soc. Canada*, 1929. Assistant, Dept. of Chemistry, University of British Columbia, 1927–29 (two years inclusive). At present holder of an 1851 Exhibition Scholarship, representing Canada, at University of Birmingham. (*Signed by*) W. N. Haworth, S. R. Carter, Wm. Wardlaw, E. L. Hirst.

TOWERS, ALBERT, 9, Cambridge Street, Guiseley, Leeds. British. Grammar School Master. M.Sc. (Leeds University). Student, Leeds University, 1922–26. Assistant Chemistry Master, Urmston Grammar School, 1928. (*Signed by*) C. K. Ingold, J. W. Baker, C. W. Shoppee.

ULLAH, SYED ANWAR, c/o S. A. Manzar, Esq., B.A., Barrister-at-law, Patna, B. & O., India. Indian (British subject by birth). Student (Research). B.Sc. from Aligarh Muslim University, Aligarh, U.P., India. Student Demonstrator at Aligarh Muslim University, Aligarh, 1927–29. Research Student at the University College, London. (*Signed by*) F. G. Donnan, Bryan Topley, S. Barratt.

WALOFF, MICHAEL, 214, Meadvale Road, Ealing, W. 5. Russian. Clerk. Final B.Sc. Student (Chemistry) at Birkbeck College. (*Signed by*) S. Sugden, F. H. Burstall, George W. Ferguson.

WHALLEY, HAROLD KENNETH, Pembroke College, Cambridge. English. Research Student in Physical Chemistry. B.A. (Cambridge); B.Sc. (London). Scholar of Pembroke College. (*Signed by*) Eric K. Rideal, N. P. McCleland, T. M. Lowry.

WILLIAMS, ALBERT EDWARD, 38, Cavendish Road, Chorlton-cum-Hardy, Manchester. British. Analytical and Works Chemist. Two years as Assistant Chemist to The Comet Chemical Co., Ltd., Stalybridge, Cheshire. One year as Chemist to the British Union Lamp Works, Ltd., Huyton, Liverpool. One year as Chemist to The Birmingham Starch Co., Ltd., Wellhead Works, Perry Barr, Birmingham. Seven years as Works Chemist to The Southern Oil Co., Ltd., Trafford Park, Manchester. I am also a Fellow of the Royal Society of Arts (London). (*Signed by*) J. W. Mellor, T. P. Hilditch, E. F. Armstrong.

WOLFENDEN, JOHN HULTON, Exeter College, Oxford. British. Teacher of Chemistry. M.A. (Oxon.); M.A. (Princeton). Fellow and Tutor in Chemistry, Exeter College, Oxford. (*Signed by*) H. B. Hartley, E. J. Bowen, C. N. Hinshelwood.

WYMAN, BERNARD, c/o Brunner, Mond & Co., Winnington Works, Northwich, Cheshire. English. Librarian. B.A., Cambridge. Technical Librarian for Brunner, Mond & Co. (*Signed by*) F. Leslie Clark, W. R. H. Hurtley, H. M. Spittle.

The following Forms of Recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2):

MERCK, KARL, Darmstadt, Germany, Goethestrasse 44. German. Partner of the Chemical Works E. Merck, Darmstadt. Dr. rer. nat. at Strassburg, 1912. *Liebigs Annalen*, 1918, Bd. 415, Thiele and Merck, "Kondensation von Inden mit Ketonen." (*Signed by*) Jocelyn Thorpe.

MITTRA, NARENDRANATH, 90, Hewett Road, Allahabad City, U.P., India. Indian. Chemist, Medical Department, East Indian Railway (State Railway). M.Sc., Allahabad University, Allahabad. Papers contributed: (1) "On Induced Oxidations," Mittra and Dhar, *Trans. Faraday Soc.*, **17**, 676 (1922). (2) "On Induced Reactions and their Analogy in Animal Bodies," *Z. Anorg. Chem.*, **122**, 146 (1922). (3) "Induced Reactions and Diabetes from the Viewpoint of Induced Oxidation," *Journ. Phys. Chem.*, Vol. XXIX, pp. 376–394, April 1925. (4) "Experiments on Hemolysis," Sen and Mittra, *J.I.C.S.*, V, issue 6, 1928; **6**, issue 2, 1929; **6**, issue 1, 1929; and *Ind. Journ. Med. Research*, **17**, No. 1, July 1929. A.I.C. (*Signed by*) N. R. Dhar, K. P. Chatterjee.

SELBY, HORACE HALL, 3787, California Street, San Diego, California, U.S.A. American. Chemist. Private Analytical Laboratory, 1921–24. Student of Chemistry, University of Wyoming, 1924–25. Chief Chemist, Hage's Ice Cream Co., San Diego, 1926–. 2nd Lt., Chem. Warfare Service, 1927–. (*Signed by*) William A. Bush.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

COFMAN, VICTOR. Les colloïdes traités au point de vue de la biophysique et de la thermodynamique. Nancy 1929. pp. 87. ill. (*Recd.* 17/12/29.) From the Author.

INDIAN LAC ASSOCIATION FOR RESEARCH. Reports of the Committee and of the Director . . . for the year 1st April 1927 to 31st March 1928, etc. Calcutta 1928 +. (*Reference.*)
From the Director.

ISABEY, JEAN. Cours de chimie. Paris 1930. pp. iv + 395. ill. 70 *fr.* (*Recd.* 6/1/30.)
From the Publishers : MM. Gauthier-Villars et Cie.

OSBORN, ALBERT S. Questioned documents. 2nd edition. Albany, N.Y. 1929. pp. xxiv + 1028. ill. 55*s.* net. (*Recd.* 9/1/30.) From the Author.

PALMÆR, WILH. The corrosion of metals. Part I. General theory. (*Ingeniörsvetenskapsakademiens Handlingar* No. 93.) Stockholm 1929. pp. 347. ill. *Kr.* 20. (*Recd.* 11/1/30.)

PAULI, WOLFGANG, and VALKÓ, EMERICH. Elektrochemie der Kolloide. Wien 1929. pp. xii + 647. ill. *M.* 66. (*Recd.* 23/12/29.) From Mr. E. Hatschek.

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. *Water Pollution Research.* Summary of Current Literature. Vol. III, etc. London 1930 +. (*Reference.*) From the Director.

[SOCIETE DE CHIMIE INDUSTRIELLE.] La grande œuvre de la chimie. Paris 1929. pp. 250. ill. 35 *fr.* (*Recd.* 21/11/29.)

SÖDERBAUM, HENRIK GUSTAV. Jac. Berzelius. Levnadsteckning. 2 vols. Uppsala 1929. pp. x + 548 + 32, viii + 540 + 14. ill. (*Recd.* 30/12/29.)
From the K. Svenska Vetenskapsakademien.

STAMBERGER, PAUL. The colloid chemistry of rubber. London 1929. pp. vi + 80. ill. 6*s.* net. (*Recd.* 20/12/29.)
From the Academic Registrar, University of London.

WILD, A. MARTIN DE. The scientific examination of pictures : an investigation of the pigments used by the Dutch and Flemish masters. Translated from the Dutch by L. C. JACKSON. London 1929. pp. xvi + 106. ill. 15*s.* net. (*Recd.* 30/12/29.)

II. *By Purchase.*

ABRAHAM, HERBERT. Asphalts and allied substances : their occurrence, modes of production, uses in the arts and methods of testing. 3rd edition. New York 1929. pp. xviii + 891. ill. 42*s.* net. (*Recd.* 23/12/29.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, February 6th, 1930, at 8 p.m., Professor H. B. BAKER, C.B.E., D.Sc., F.R.S., Vice-President, in the Chair.

The CHAIRMAN referred to the loss sustained by the Society, through death on January 18th, of Henry Wilson Hake, who was elected a Fellow of the Society on January 20th, 1876.

The following were formally admitted Fellows of the Chemical Society: Dorothy L. Fox, Elizabeth E. J. Marler, F. S. H. Head, F. H. Curd, W. Solomon, R. Winstanley Lunt, C. E. Duce.

Forms of Recommendation for Fellowship were read for the first time in favour of:

Edmund David Patrick Barkworth, B.A., Flat 2, 4, Colville Square, W. 11.
Reginald Henry Coysh, M.Sc., 7, Cannon Close, Raynes Park, S.W. 20.
Louis Robert Hickson, B.Sc., A.I.C., 19, The Cambridge Road, N. 17.
Arthur William Middleton, B.Sc., 27, St. Bernard's Road, East Ham, E. 6.
Margaret Mary Murray, M.Sc., 42, Wilton Crescent, Wimbledon, S.W. 19.
Walter Frederick Thorne, B.Sc., 4, Langley Road, Branksome, Bournemouth.
Alfred Harold Whitaker, 131, Holmleigh Road, Stamford Hill, N. 16.
Robert David Williams, M.Sc., The Paint Research Station, Teddington, Middlesex.

The following papers were read:

"The photolysis of aqueous hydrogen peroxide solutions. Part I. Experimental methods." By A. J. ALLMAND and D. W. G. STYLE.

"The photolysis of aqueous hydrogen peroxide solutions. Part II. Experimental results." By A. J. ALLMAND and D. W. G. STYLE.

"The scission of diaryl ethers and related compounds by means of piperidine. Part III. The nitration of 2 : 4-dibromo-2′ : 4′-dinitrodiphenyl ether and of 2 : 4-dibromophenyl *p*-toluenesulphonate and benzoate. The chlorination and bromination of *m*-nitrophenol." By R. V. HENLEY and E. E. TURNER.

"The action of phenyldiazonium chloride on 2-nitroethanol and its derivatives." By E. C. S. JONES and J. KENNER.

Ordinary Scientific Meeting, Thursday, February 20th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death on February 19th, of Mr. Hugh Chester Bell, who was elected a Fellow on December 15th, 1921.

Forms of Recommendation for Fellowship were read for the first time in favour of :

Ivor Lloyd, 8a, Chip Street, Clapham, S.W. 4.
William Dales Oldham, 22, Edenhall Avenue, Levenshulme, Manchester.
William Edward Raybould, B.Sc., A.I.C., 30, Station Street, Sutton Coldfield, Birmingham.
Frederic Eric Tomkinson, M.A., B.Sc., Eirianfa, St. Asaph, Flintshire.
Eric Walton, M.Sc., Ph.D., 15, Avenue Gardens, Teddington, Middlesex.
Eric Ernest Thomas Young, Elmhurst, Lonsdale Place, Derby.

The following Forms of Recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2) :

Paul Borg, Office of Agriculture, Malta.
R. Chester Roberts, M.A., B.S., Colgate University, Hamilton, N.Y., U.S.A.
Vinayak Yeshwant Shewade, B.Sc., 80, Ada Bazar, Indore, Central India.

Miss Z. Kamil and Dr. E. H. Farmer were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows :

John Stuart Anderson, B.Sc., A.R.C.S., D.I.C.
Hubert Vernon Bettley-Cooke.
Thomas Stewart Brechin.
Geoffrey Herbert Cheesman, B.Sc., A.R.C.S.
Kathleen Mary Collier.
Harold Cordingley, B.Sc.
Howard Augustus Costigan, B.Sc., Ph.D.
John Malcolm Davies.
Mohammad Qamrud Doja, B.A., B.Sc.
Cecil Philip Ellis, B.Sc., A.I.C.
Nellie Ivy Fisher, B.Sc., A.R.C.S.
Hugh Bouvard Fraser, B.Sc.
Giichiro Fuseya.
Robert Gaddie, B.Sc.
Guy Drummond Greville, B.A.
Lena Halpern, A.M.
George Christopher Hewson.
Leslie Hey, B.Sc.
John Hunter, B.Sc., A.I.C.
Frank Edward Joselin, B.Sc.
Heizaburo Kondo.
Francis George Lamont, M.Sc.
Arthur Stuart Clark Lawrence.
Ernest Leton.
Albert Leonard Lovecy, B.Sc.
Karl Merck.
Arthur Kelman Mills, Ph.D.
James Edward Mills, M.Sc.
Narendranath Mittra, M.Sc.
Cecil Graham Traquair Morison, M.A.
Sayed Mosallam, B.Sc.
Marjorie Winifred Odell, B.Sc., A.R.C.S.
Gordon van Praagh, B.Sc.
Elsie Ramsden, B.Sc.
George Alexander Robertson.
Edmund Brodie Robinson, B.Sc., A.I.C.
Rosa Schalit, B.Sc., A.R.C.S.
Horace Hall Selby.

Florence Mary Ellaline Shepherd, M.Sc.
Harvey Richard Lyle Streight, M.A.
Albert Towers, M.Sc.
Syed Anwar Ullah, B.Sc.
Michael Waloff.
Harold Kenneth Whalley, B.A., B.Sc.
Albert Edward Williams.
John Hulton Wolfenden, M.A.
Bernard Wyman, B.A.

The following papers were read :

"Trypanocidal action and chemical constitution. Part IX. Aromatic arsinic acids containing an amide group." By G. A. C. GOUGH and H. KING.

"The properties of the chlorides of sulphur. Part III. Dielectric constants." By T. M. LOWRY and G. JESSOP.

"The properties of the chlorides of sulphur. Part IV. Density and surface tension." By T. M. LOWRY and G. JESSOP.

"Strychnine and brucine. Part X. The degradation of dinitrostrycholcarboxylic acid; its recognition as a derivative of quinoline and the consequent modification of the constitutional formulæ for the strychnos bases proposed in Part VII." By K. N. MENON, (the late) W. H. PERKIN, jun., and R. ROBINSON.

THE HUGO MÜLLER LECTURE.

The Hugo Müller Lecture entitled "The Chemistry and Geochemistry of the Titanium Group" will be delivered by Professor Dr. G. von Hevesy at the Salters' Hall, St. Swithin's Lane, E.C. 4, on Wednesday, March 26th, at 5.30 p.m. (by kind permission of the Court of the Salters' Company). Tickets of admission will not be required.

89TH ANNUAL GENERAL MEETING.

The Annual General Meeting will be held at Burlington House, on Thursday, March 27th, 1930, at 4 p.m., when the President will deliver his Address.

ANNIVERSARY DINNER.

The Anniversary Dinner of the Society will be held at the Hotel Victoria, Edward VII Rooms, Northumberland Avenue, W.C. 2, on Thursday, March 27th, 1930 (the day of the Annual General Meeting), at 7 for 7.30 p.m.

The price of the tickets will be Twelve Shillings and Sixpence (12*s.* 6*d.*) each, including gratuities to waiters.

Tickets can be obtained from the Assistant Secretary, Chemical Society, Burlington House, Piccadilly, London, W. 1, and a remit-

tance for the number of tickets required, made payable to Mr. S. E. Carr, must accompany each application. Application should be made as soon as possible.

RAILWAY FACILITIES.

The Railway Companies have granted facilities by which those attending the meetings on March 26th and 27th will be able to travel from all parts of the country to London at the reduced rate of an ordinary single fare and one-third for the double journey, *provided that not less than* 100 *persons avail themselves of this privilege.* No minimum distance is fixed, and the facilities apply to all the Railway Companies in Great Britain except the Metropolitan, Metropolitan District and London Electric Railways. Tickets will be available from March 25th to March 28th (inclusive). If you desire to take advantage of this privilege you should apply to Mr. S. E. Carr, Chemical Society, Burlington House, Piccadilly, London, W. 1, for a signed voucher, which must be surrendered at the Booking Office when the ticket is purchased.

List of papers, or abstracts thereof, received between January 16th and February 20th, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting, or which have appeared in the Journal.)

"Derivatives of 3-keto-2 : 3-dihydrothionaphthen 1 : 1-dioxide." By A. COHEN and S. SMILES.

"Note on the melting point of 1 : 3 : 5-xylenoxyacetic acid." By T. LOVE.

"Nitration of phenyl substituents of heterocyclic nuclei." By R. FORSYTH and F. L. PYMAN.

"The apparent hydration of ions. Part IV. The densities and viscosities of saturated solutions of silver nitrate in nitric acid." By J. W. INGHAM.

"The ternary system zinc oxide–hydrochloric acid–zinc chloride–water." By H. C. HOLLAND.

"The interaction between alkyl Grignard reagents and antimony trichloride." By W. J. C. DYKE, W. C. DAVIES, and W. J. JONES.

"Syntheses by means of magnesium amyl halides." By W. C. DAVIES, R. S. DIXON, and W. J. JONES.

"Colour and constitution. Part V. The colours of certain azo-dyes from 2-chloro-3-aminoanisole and of the nitrobenz-

aldehyde-3-chloroanisyl-2-hydrazones." By H. H. HODGSON and A. KERSHAW.

" Intramolecular rearrangement in the isomeric tetrachloro-derivatives of *p*-tolylhydrazones." By F. D. CHATTAWAY and A. B. ADAMSON.

" Passivity of metals. Part IV. The influence of acids in passivity and corrosion." By U. R. EVANS.

" The reduction of triphenylhalogenomethanes." By J. C. THOMAS, S. T. BOWDEN, and W. J. JONES.

" The angles of floating lenses." By C. G. LYONS.

" A phase diagram for unimolecular films." By C. G. LYONS and E. K. RIDEAL.

" The electrical conductivities of solutions of tetramethylammonium iodide in benzonitrile." By A. R. MARTIN.

" Strychnine and brucine. Part IX. Preparation of some isomerides of dinitrostrychol and trinitrostrychol." By J. N. ASHLEY, (the late) W. H. PERKIN, and R. ROBINSON.

" The nature of the alternating effect in carbon chains. Part XXXII. The directive influence of ψ-basic systems in aromatic substitution. Nitration of benzylidene-*m*-nitroaniline." By J. W. BAKER and C. K. INGOLD.

" The chemistry of the three-carbon system. Part XXIV. The regeneration of some esters from their sodio-derivatives." By W. E. HUGH and G. A. R. KON.

" Primary and associated results of replacement of hydrogen directly attached to 4-co-ordinated carbon." By L. COCKER, A. LAPWORTH, and A. WALTON.

" The nitrosation of phenols. Part VIII. Resorcinol monoethyl ether." By H. H. HODGSON and H. CLAY.

" The determination of the dissociation pressures of hydrated salts by a dynamical method. Part III." By J. R. PARTINGTON and R. J. WINTERTON.

" γ-Phenyl-α-methylpropyldimethylarsine, β-benzylbutyldimethylarsine, and some related compounds." By A. BREWIN and E. E. TURNER.

" *iso*-β-Naphthol sulphide." By L. A. WARREN and S. SMILES.

" The partial esterification of polyhydric alcohols. Part XI. The differentiation between isomeric glycerides." By A. FAIRBOURNE.

" The reactivity of halogen atoms in compounds of the pyridine series. Part I. The halides of 2-stilbazole." By J. W. BLOOD and B. D. SHAW.

" A synthesis of pyrylium salts of anthocyanidin type. Part XIX. A synthesis of delphinidin chloride not involving a demethyl-

ation process together with an account of the synthesis of hirsutidin chloride and of delphinidin chloride 3′-methyl ether, possibly identical with petunidin chloride." By W. BRADLEY, R. ROBINSON, and G. SCHWARZENBACH.

" Digoxin, a new digitalis glucoside." By S. SMITH.

" Studies in polymorphism. Part I. A preliminary investigation of the polymorphism of *o*-nitroaniline." By J. F. J. DIPPY and N. H. HARTSHORNE.

" A simple method for the preparation of maleic anhydride." By F. A. MASON.

" The action of nitric acid on some metals." By E. S. HEDGES.

" The ' uniform movement ' of flame in mixtures of ethylene, propylene, butylene, and air." By E. H. M. GEORGESON and F. J. HARTWELL.

" Further degradative experiments in the morphine group." By R. S. CAHN.

" Crystalline α-methylmannofuranoside (γ-methylmannoside). Part I." By W. N. HAWORTH and C. R. PORTER.

" Crystalline α-methylmannofuranoside (γ-methylmannoside). Part II." By W. N. HAWORTH, E. L. HIRST, and J. I. WEBB.

" Physical constants and miscibility curves of samples of *n*-butyric and *iso*butyric acids." By W. H. PATTERSON.

" The nitrosation of phenols. Part IX. Further study of the nitrosation of *m*-bromophenol." By H. H. HODGSON and A. KERSHAW.

" Symmetrical triad prototropic systems. Part VI. The effect of substitution on tautomeric mobility and equilibrium in the αγ-diphenylpropene system." By C. W. SHOPPEE.

" Conductivity measurements of the comparative rates of hydrolysis of lactones derived from simple sugars." By S. R. CARTER, W. N. HAWORTH, and R. A. ROBINSON.

" A synthesis of certain higher aliphatic compounds. Part III. A variation of the keto-acid synthesis, constituting an improved method for the extension of normal carbon chains." By (MRS.) G. M. ROBINSON.

" The essential oil of *Backhousia angustifolia*. Part II. The isolation of naturally occurring β-diketones; α- and β-angustiones." By C. S. GIBSON, A. R. PENFOLD, and J. L. SIMONSEN.

" Experiments on the constitution of the aloins." Part II. By C. S. GIBSON and J. L. SIMONSEN.

" Influence of poles and polar linkings on the course pursued by elimination reactions. Part VII. A generalised form of the olefinic degradation of sulphones." By G. W. FENTON and C. K. INGOLD.

" Influence of poles and polar linkings on the course pursued by elimination reactions. Part VIII. The methylenic and paraffinic degradation of sulphones." By C. K. INGOLD and J. A. JESSOP.

" Influence of poles and polar linkings on the course pursued by elimination reactions. Part IX. Isolation of a substance believed to contain a semipolar double linking with participating carbon." By C. K. INGOLD and J. A. JESSOP.

" Oxidation of *p*-aminophenyltrimethylammonium methosulphate and some quaternary ammonium derivatives." By A. ZAKI.

" Passivity of metals. Part V. The potential–time curves of some iron alloys." By L. C. BANNISTER and U. R. EVANS.

" Anthoxanthins. Part XI. A synthesis of diosmetin and of luteolin 3'-methyl ether." By A. LOVECY, R. ROBINSON, and S. SUGASAWA.

" Anthoxanthins. Part XII. Transition from a flavylium salt to a flavone, illustrated by a new synthesis of scutellarein tetramethyl ether." By R. ROBINSON and G. SCHWARZENBACH.

" The octammines—with special reference to tin." By A. J. COOPER and E. WARDLAW.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

DAVIES, CECIL WHITFIELD. The conductivity of solutions and the modern dissociation theory. London 1930. pp. viii + 204. ill. 15*s*. net. (*Recd.* 4/2/30.)
From the Publishers : Messrs. Chapman & Hall.

DESBLEDS, L. BLIN. Exact colour matching and specifying. Paris [n.d.]. pp. 116. ill. 4*s*. net. (*Recd.* 23/1/30.)
From the Publishers : Technological and Industrial Service.

HAISSINSKY, M. L'atomistica moderna e la chimica. Milano 1930. pp. xvi + 315. ill. *L*. 35. (*Recd.* 4/2/30.)
From the Publisher : Ulrico Hoepli.

MENSCHUTKIN, BORIS NIKOLAEVITSCH. Abridged chemistry for higher educational institutions. 2nd edition. Leningrad 1930. pp. 161. [In Russian.] *R*. 2.50. (*Recd.* 4/2/30.) From the Author.

SOCIÉTÉ DE BIOLOGIE. Comptes rendus. Vol. CIII, etc. Paris 1930 +. (*Reference.*) From the Biochemical Society.

II. *By Purchase.*

ANDRESEN, M. [and others]. Erzeugung und Prüfung lichtempfindlicher Schichten. Lichtquellen. (Handb. wiss. angew. Photo-

graphie. Vol. IV.). Wien 1930. pp. viii + 344. ill. *M.* 39. (*Recd.* 16/1/30.)

ASCHAN, OSSIAN. Naphtenverbindungen, Terpene und Campherarten inkl. Pinusharzsäuren sowie Körper der Kautschukgruppe. Berlin 1929. pp. xvi + 378. *M.* 32. (*Recd.* 4/2/30.)

BEHRE, ALFRED. Chemische Laboratorien, ihre neuzeitliche Einrichtung und Leitung. Leipzig 1928. pp. x + 113 + 33 plates. ill. *M.* 7. (*Recd.* 13/12/29.)

BERMBACH, WILLIBAD. Die Akkumulatoren, ihre Theorie, Herstellung, Behandlung und Verwendung. Berlin 1929. pp. vi + 214. ill. *M.* 9.75. (*Recd.* 2/1/30.)

BONE, WILLIAM ARTHUR, NEWITT, DUDLEY MAURICE, and TOWNEND, DONALD THOMAS ALFRED. Gaseous combustion at high pressures: being mainly an account of the researches carried out in the high pressure gas research laboratories of the Imperial College of Science and Technology, London, together with the equipment and experimental methods employed. London 1929. pp. xiv + 396. 42*s.* net. (*Recd.* 16/1/30.)

BORN, MAX, and JORDAN, PASCUAL. Vorlesungen über Atommechanik. Vol. II. Elementare Quantenmechanik. (Struktur der Materie in Einzeldarstellungen.) Berlin 1930. pp. xii + 434. *M.* 30. (*Recd.* 7/2/30.)

BRUNNER, ALBERT. Analyse der Azofarbstoffe. Berlin 1929. pp. vi + 124. ill. *M.* 11.50. (*Recd.* 2/1/30.)

BYWATERS, HUBERT WILLIAM. Modern methods of cocoa and chocolate manufacture. London 1930. pp. xii + 316. ill. 21*s.* net. (*Recd.* 21/1/30.)

CAMPBELL, NORMAN ROBERT, and RITCHIE, DOROTHY. Photoelectric cells: their properties, use, and applications. London 1929. pp. viii + 209. ill. 15*s.* net. (*Recd.* 16/1/30.)

CONN, H. J. Biological stains. 2nd edition. Enlarged and revised with the assistance of W. C. HOLMES and R. W. FRENCH. Geneva, N.Y. 1929. pp. 224. ill. 13*s.* 6*d.* net. (*Recd.* 21/1/30.)

DEBYE, PETER. [Editor.] Dipolmoment und chemische Struktur. Leipzig 1929. pp. viii + 134. ill. *M.* 9. (*Recd.* 12/2/30.)

DEUTSCHE BUNSEN GESELLSCHAFT. Messungen elektromotorische Kräfte galvanischer Ketten mit wässerigen Elektrolyten. Edited by RICHARD ABEGG, FRIEDRICH AUERBACH, and ROBERT LUTHER. Halle (Saale) 1911. pp. xii + 213. *M.* 3.50.

—— —— Ergänzungsheft I. Edited by FRIEDRICH AUERBACH. Halle (Saale) 1915. pp. xii + 60. *M.* 2.

—— —— Ergänzungsheft II. Edited by CARL DRUCKER. Berlin 1929. pp. x + 234. *M.* 24. (*Recd.* 2/12/29.)

EUCKEN, ARNOLD. Lehrbuch der chemischen Physik. Being the 3rd edition of Grundriss der physikalischen Chemie. Leipzig 1930. pp. xvi + 1037. ill. *M.* 56. (*Recd.* 12/2/30.)

FINCKE, HEINRICH. Die Kakaobutter und ihre Verfälschungen. Stuttgart 1929. pp. 238. *M.* 20. (*Recd.* 2/1/30.)

GERLACH, WALTHER, and SCHWEITZER, EUGEN. Die chemische Emissions-Spektralanalyse. Grundlagen und Methoden. Leipzig 1930. pp. vi + 120. ill. *M.* 12.75. (*Recd.* 4/2/30.)

GORTNER, ROSS AIKEN. Outlines of biochemistry. The organic chemistry and the physico-chemical reactions of biologically important compounds and systems. New York 1929. pp. xvi + 793. ill. 30*s.* net. (*Recd.* 16/1/30.)

GRÜN, ADOLF. Analyse der Fette und Wachse. Vol. II. Berlin 1929. pp. xvi + 806. ill. *M.* 98. (*Recd.* 19/12/29.)

HACKH, INGO WALDO DAGOBERT. A chemical dictionary containing the words generally used in chemistry, and many of the terms used in the related sciences. Based on recent chemical literature. [Philadelphia 1929.] pp. viii + 790. ill. (*Reference.*) 2*s.* net.

HANDBUCH DER ALLGEMEINEN CHEMIE. Edited by PAUL WALDEN and CARL DRUCKER. VIII. i. Elektromotorische Kräfte, Elektrolyse und Polarisation. By ROBERT KREMANN and ROBERT MÜLLER. Leipzig 1930. pp. xvi + 891. ill. (*Reference.*) *M.* 85.

HERBIG, W. Die Öle und Fette in der Textilindustrie. 2nd edition. Stuttgart 1929. pp. viii + 451. ill. *M.* 32. (*Recd.* 2/1/30.)

KAPPEN, HUBERT. Die Bodenazidität. Nach agrikulturchemischen Gesichtspunkten dargestellt. Berlin 1929. pp. viii + 363. ill. *M.* 39. (*Recd.* 2/1/30.)

KAUSCH, OSCAR. Phosphor, Phosphorsäure und Phosphate. Ihre Herstellung und Verwendung. Berlin 1929. pp. vi + 325. ill. *M.* 42. (*Recd.* 12/2/30.)

LUNGE, GEORGE. Technical chemists' handbook. 3rd edition. Revised by ALEXANDER CHARLES CUMMING. London 1929. pp. xvi + 262. 12*s.* 6*d.* net. (*Recd.* 21/1/30.)

MARLOW, GEORGE STANLEY WITHERS. Law and industry. London 1929. pp. viii + 319. 17*s.* 6*d.* net. (*Recd.* 21/1/30.)

MIERS, SIR HENRY ALEXANDER. Mineralogy: an introduction to the scientific study of minerals. 2nd edition. Revised by HERBERT LISTER BOWMAN. London 1929. pp. xx + 658. ill. 30*s.* net. (*Recd.* 16/1/30.)

NASH, ALFRED WILLIAM and BOWEN, ARTHUR RILEY. The principles and practice of lubrication. London 1929. pp. xii + 315. ill. 15*s.* net. (*Recd.* 16/1/30.)

NIEL, C. B. VAN. The propionic acid bacteria. Haarlem 1928. pp. viii + 187. ill. 13*s.* 6*d.* net. (*Recd.* 13/2/30.)

PICKARD, JOSEPH ALLEN. Filtration and filters. With a section on the mathematical aspects of filtration by A. J. V. UNDERWOOD. London 1929. pp. 488. ill. 45*s.* net. (*Recd.* 16/1/30.)

PLINIUS, CAIUS SECUNDUS. Chapters on chemical subjects. Part I. Edited, with translation and notes, by KENNETH CLAUDE BAILEY. London 1929. pp. 249. 12*s.* 6*d.* net. (*Recd.* 21/1/30.)

SEDLACZEK, ERWIN. Die Krackverfahren unter Anwendung von Druck (Druckwärmespaltung). Berlin 1929. pp. iv + 402. ill. *M.* 45. (*Recd.* 2/1/30.)

SPONS' Workshop receipts for manufacturers and scientific amateurs. Supplement. London 1930. pp. viii + 458. ill. (*Reference.*) 5*s.* net.

STUCKERT, LUDWIG. Die Emailfabrikation. Ein Lehr- und Handbuch für die Emailindustrie. Berlin 1929. pp. viii + 276. ill. (*Recd.* 2/1/30.)

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—— —— Pamphlet No. 15. The work of the Division of Economic Entomology for the year 1928–29. By ROBIN JOHN TILLYARD. Melbourne 1929. pp. 19.

—— —— Pamphlet No. 16. The work of the Division of Animal Nutrition for the year 1928–29. By THORBURN BRAILSFORD ROBERTSON. Melbourne 1929. pp. 30.

BRITISH PHOTOGRAPHIC RESEARCH ASSOCIATION. Report for the year 1928–29. London [1929]. pp. 15.

ELLIS, OLIVER COLIGNY DE CHAMPFLEUR. Flame movements in gaseous mixtures. (From *Fuel*, 1928, 7.)

GARCÍA-BLANCO, J. Microdeterminación directa del agua en tejidos conectivos. (From the *Arq. Seminario Est. Galegos*, 1929.)

García-Blanco, J. Sobre la regulación hormonal de la economía hídrica en el tejido celular subcutáneo. (From the *Arq. Seminario Est. Galegos*, 1929.)

Indian Lac Association for Research. Bulletin No. 1. Physical properties of shellac solutions. Part I. By M. Rangaswami and M. Venugopalan. Calcutta 1928. pp. ii + 14.

Institute of Chemistry of Great Britain and Ireland. The world's sugar industry. By Lewis Eynon. London 1929. pp. 20.

Kuno, Yufu. Critical study on the enzymic decomposition of nicotine. (From the *Bul. Sci. Fak. Terkult. Kjûsu*, 1929, 3.) [In Japanese. English summary.]

Leffmann, Henry, and Pines, Charles C. Further notes on tests for acetone and aldehyde. (From the *Bull. Wagner Free Inst. Sci. Philadelphia*, 1929, 4.)

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—— El contenido en iodo de las principales algas marinas de las costas de Galicia. (From *Datos Geoquím, Galicia*, 1927.)

Pondal, Isidro Parga, and Vázquez-Garriga, J. Contribución al estudio de los minerales de wolframio de Galicia. I. Análisis de las wolframitas de la Brea, Corpiño y Carboeiro (Lalín, Pontevedra). (From the *Arq. Seminario Est. Galegos*, 1929.)

Scientific and Industrial Research, Department of. Report of test . . . on the Turner retort installed at the works of the Comac Oil Co., Ltd., Coalburn, Lanarkshire. London 1930. pp. vi + 29. ill.

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—— —— Special Report No. 13. The use of calcium chloride or sodium chloride as a protection for mortar or concrete against frost. By W. N. THOMAS. London 1929. pp. iv + 30.

—— —— Technical Paper No. 8. The corrosion of lead in buildings. By FRANK LAWRENCE BRADY. London 1929. pp. vi + 30. ill.

—— *Fuel Research.* Special Report No. 5. Fires in steamship bunker and cargo coal. London 1929. pp. vi + 55. ill.

—— —— Technical Paper No. 24. The assay of coal for carbonisation purposes. (Part iii.) Correlation with coal gas manufacture. By JAMES GRIEVE KING and L. J. EDGCOMBE. London 1930. pp. vi + 30. ill.

SHINODA, J., SATO, S., and KAWAGOYE, M. Neue Synthese von Polyoxychalkon, Polyoxyhydro-chalkon und Polyoxyflavanon. VI. Zur Synthese von Butein, Butin und Phloretin. (From the *J. Pharm. Soc. Japan*, 1929, **49**.) [In Japanese. German summary.]

SOUTH AFRICA, UNION OF. *Department of Agriculture.* (Division of Chemistry, Series No. 95.) The soil solution and its relation to the soil colloids. By D. J. R. VAN WIJK. (From the *Proc. Dept. Conf.*, 1929.)

—— —— (Division of Chemistry, Series No. 96.) Note on the distribution of nitrogen in some fruits. By P. D. V. D. R. COPEMAN. (From the *Proc. Dept. Conf.*, 1929.)

—— —— (Division of Chemistry, Series No. 97.) Routine mechanical analysis of soils by the Robinson method. By J. P. VAN ZIJL. (From the *Proc. Dept. Conf.*, 1929.)

—— —— (Division of Chemistry, Series No. 98.) A report of the findings of the "pica survey" of 1921–1922. By J. P. VAN ZIJL, H. H. GREEN, and B. DE C. MARCHAND. (From the *Proc. Dept. Conf.*, 1929.)

—— —— (Division of Chemistry, Series No. 99). Hardpans, concretionary layers and neo-formations of the soils of the more arid parts of the Union. By J. V. CUTLER. (From the *Proc. Dept. Conf.*, 1929.)

—— —— (Division of Chemistry, Series No. 100.) The fixation of phosphates in soils. By C. O. WILLIAMS. (From the *Proc. Dept. Conf.*, 1929.)

UNITED STATES. *Department of Agriculture.* Technical Bulletin No. 141. The spontaneous combustion of hay. By CHARLES A. BROWNE. Washington 1929. pp. 38. ill.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, March 6th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	Died.
William E. Bickerdike	Dec. 7th, 1865.	Feb. 26th, 1930.
Alaric V. C. Fenby	May 6th 1897.	Feb. 21st, 1930.

The following list of Nominations for vacant places on the Council was read from the Chair :

President : J. F. THORPE.

Vice-Presidents who have filled the office of President (two vacancies) :

P. F. FRANKLAND, A. SCOTT.

Vice-Presidents who have not filled the office of President (two vacancies) :

A. LAPWORTH, F. L. PYMAN.

Ordinary Members of the Council :

Town Members (*i.e.* those resident within a radius of fifty miles from Charing Cross) ; three vacancies :

T. J. DRAKELEY, R. H. A. PLIMMER, C. K. TINKLER.

Country Members (*i.e.* those resident beyond a radius of fifty miles from Charing Cross) ; three vacancies :

H. M. DAWSON (Leeds), E. HOPE (Oxford), J. KENDALL (Edinburgh).

The following were formally admitted Fellows of the Chemical Society : Edmund Langley Hirst, R. Campbell Feather, and A. Vasundhara.

Forms of Recommendations were read for the first time in favour of :

Norah Janet Broadway, B.Sc., 16, Lodge Road, West Croydon.
John Henry Daniels, 4, Mill Lane, Wallasey, Cheshire.

Wilfred Morley Morgans, B.Sc., Charman Dene, Cromwell Avenue, Cheshunt.
Donald Price, M.A., Ph.D., 37, Grange Road, Cambridge.
Pundi Ranga Ramanujam, B.A., 18, Gloucester Road, Kew.
Foster Dee Snell, B.S., A.M., Ph.D., 130, Clinton Street, Brooklyn, New York.
James Williamson, Ivanhoe, Bilston Road, Aigburth, Liverpool.

The following papers were read :

" Crystalline α-methylmannofuranoside (γ-methylmannoside). Part I." By W. N. HAWORTH and C. R. PORTER.

" Crystalline α-methylmannofuranoside (γ-methylmannoside). Part II." By W. N. HAWORTH, E. L. HIRST, and J. I. WEBB.

" Passivity of metals. Part IV. The influence of acids in passivity and corrosion." By U. R. EVANS.

" Influence of poles and polar linkings on the course pursued by elimination reactions. Part VII. A generalised form of the olefinic degradation of sulphones." By G. W. FENTON and C. K. INGOLD.

" Influence of poles and polar linkings on the course pursued by elimination reactions. Part VIII. The methylenic and paraffinic degradations of sulphones." By C. K. INGOLD and J. A. JESSOP.

" Influence of poles and polar linkings on the course pursued by elimination reactions. Part IX. Isolation of a substance believed to contain a semi-polar double linking with participating carbon." By C. K. INGOLD and J. A. JESSOP.

Ordinary Scientific Meeting, Thursday, March 20th, 1930, at 8 p.m., the President, Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	Died.
Kennedy J. P. Orton	May 6th, 1897.	March 16th, 1930.
John Henry Taylor	May 2nd, 1918.	July 15th, 1929.
Sir David Wilson	June 21st, 1883.	March 8th, 1930.
Allister MacLean Wright	Dec. 3rd, 1908.	Jan. 31st, 1930.

In referring to the death of Professor K. J. P. Orton the President said :

> " Professor Orton, who died on March 16th last at the age of 58, was Professor of Chemistry in the University College of N Wales, Bangor. Formerly he held the position of demonstrator at St. Bartholomew's Hospital. He was the author of numerous papers which appeared in our Journal dealing with

chloroamines, nitroamines, and kindred subjects. In this field he was a successful pioneer in the application of kinetic measurements to the elucidation of reaction mechanism. He served on the Council from 1913 to 1917, and from 1926 to 1929, and was elected F.R.S. in 1921. Fellows will mourn his death as a loss not only to the Society, but to Chemistry generally.

It was announced that the following Address of Congratulation had been sealed in Council that afternoon and would be presented to the American Society of Mechanical Engineers on the occasion of its 50th Anniversary Celebrations to be held in New York, Hoboken, and Washington from April 5th to 9th, 1930 :—

The Chemical Society
to the
American Society of Mechanical Engineers.

The meeting held at Stevens Institute of Technology in Hoboken, N.J., on the 7th April, 1880, was fraught with signal importance for the future of Mechanical and Engineering Science in the United States. Fifty years have elapsed since then, and during those years your Society has ever been prominent in developing the cultural, social, economic, and political life of your country on its engineering side. Your activities have been closely linked with the work of the chemist, for it is certain that without the close co-operation between engineering and chemical science which your Society has fostered the great development of chemical industry in modern times would have been impossible.

The Chemical Society therefore sends greetings and congratulations coupled with the hope that the American Society of Mechanical Engineers may continue with ever increasing success to further the objects for which it was founded.

Signed on behalf of the Chemical Society,

L.S.

JOCELYN THORPE, *President.*
T. SLATER PRICE, *Treasurer.*
C. S. GIBSON, T. S. MOORE, } *Secretaries.*
F. G. DONNAN, *Foreign Secretary.*

Sealed in Council this Twentieth Day of March, One Thousand Nine Hundred and Thirty.

Forms of Recommendation for Fellowship were read for the first time in favour of :

Dorothy May Diamond, South View, Langton, Tunbridge Wells.
Homi Ruttonji Nanji, B.Sc., 48, Penywern Road, S.W. 5.
Wilfred Beaumont Orr, D.Sc., Ph.D., 212, Upper Newtownards Road, Bloomfield, Belfast.

Charles Benjamin Walter Richardson, B.Sc., 133, Inverness Terrace, Bayswater, W. 2.
Allan Coley Waine, B.Sc., Ellesmere, Anchorage Road, Sutton Coldfield, Birmingham.
Ronald Southern Walton, B.Sc., The Ranelagh School, Athlone, I.F.S.

The following forms of recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2) :

N. Dănailă, Institute of Industrial Chemistry, Calea Masilor 132, Bucarest.
Lionel Stuart Davis, Government Laboratory, Georgetown, Demerara.
William Francis, F.I.C., Government Laboratory, Georgetown, Demerara.
G. G. Longinescu, University of Bucarest, Bucarest.
Samuel Marion McElvain, 2017, Adams Street, Madison, Wisc., U.S.A.
Emil Severin, Polytechnic School, Bucarest.
Albert Ernest Robert Westman, M.A., Ph.D., 47, Queen's Park, Toronto.

The following papers were read :

" The mechanism of and constitutional factors controlling the hydrolysis of carboxylic esters. Part I. The constitutional significance of hydrolytic stability maxima." By C. K. INGOLD.

" The mechanism of and constitutional factors controlling the hydrolysis of carboxylic esters. Part II. Hydrolytic stability maxima of some glyceric esters." By (Miss) C. M. GROOCOCK, C. K. INGOLD, and A. JACKSON.

" On active nitrogen. Part VIII. (*a*) The influence of photogens and of surfaces upon glow phenomena in nitrogen; and (*b*) The effects of addition of other gases to luminous nitrogen." By E. J. B. WILLEY.

FARADAY LECTURE.

The Faraday Lecture will be delivered by Professor Dr. Niels Bohr, of Copenhagen, on Thursday, May 8th, 1930. The title of the Lecture will be " Chemistry and the Quantum Theory."

Further particulars will be announced later.

List of Papers, or Abstracts thereof, received between February 20th and March 20th, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting or which have appeared in the Journal.)

" Tetrachloroiodides of the alkaloids." By F. D. CHATTAWAY and G. D. PARKES.

" Quinoline compounds containing arsenic. Part I. Synthesis of 6-methoxyquinoline derivatives of aminophenylarsinic acids." By R. H. SLATER.

"*Cannabis Indica* resin. Part I. The constitution of nitrocannabinolactone (oxycannabin)." By R. S. CAHN.

"The nature of the alternating effect in carbon chains. Part XXXIII. The nitration of some aromatic sulphonium and selenonium salts." By J. W. BAKER and W. G. MOFFITT.

"Aromatic stibinic acids containing phenyl and quinolyl radicals." By G. T. MORGAN and J. W. COOK.

"The rearrangement of the alkylanilines. Part II. The course of the rearrangement in presence of metal salts." By W. J. HICKINBOTTOM, and (in part) A. C. WAINE.

"The rearrangement of the alkylanilines. Part III. The formation of *p*-amino*iso*butylbenzene and of *p*-amino-*tert.*-butylbenzene from *iso*butylaniline." By W. J. HICKINBOTTOM and G. H. PRESTON.

"The preparation of secondary aryl alkylamines and their purification." By W. J. HICKINBOTTOM.

"Organic derivatives of silicon. Part XLI. *cyclo*Hexyl derivatives of silicane and silicoethane." By K. W. PALMER and F. S. KIPPING.

"Organic derivatives of silicon. Part XLII. The formation of tri- and tetra-phenylsilicane by the action of sodium on triphenylsilicyl chloride." By F. S. KIPPING and J. F. FROST.

"Attempts to prepare cyanine dyes from quaternary salts of 2-methylacenaphthpyridine and of *ms*-methylacridine." By F. M. HAMER.

"The addition of halogens to unsaturated acids and esters. Part III. The velocity of bromination." By N. W. HANSON and D. M. WILLIAMS.

"Investigations in the diphenyl series. Part IX. Further experiments with sulphonamides." By F. BELL.

"The behaviour of hydrogen chloride in different solvents." By W. F. K. WYNNE-JONES.

"The effect of gas pressure on the colour of halogen vapours." By A. SHEARER and R. WRIGHT.

"The calculation of activity coefficients from solubility measurements: thallous chloride." By H. E. BLAYDEN and C. W. DAVIES.

"10-Chloro-5 : 10-dihydrophenarsazine and its derivatives. Part XIII. Absorption spectra." By C. S. GIBSON, E. S. HISCOCKS, J. D. A. JOHNSON, and J. L. JONES.

"The action of fuming nitric acid on the 4-halogeno-2 : 6-dibromophenols and -anisoles. Anomalous behaviour of fluorine." By H. H. HODGSON and J. NIXON.

"Polycyclic aromatic hydrocarbons. Part I. α- and β-Phenyl-

anthracene and some derivatives of 1 : 2-benzanthracene." By J. W. COOK.

"The dismutation of some disulphides." By E. W. MCCLELLAND and L. A. WARREN.

"Orientation effects in the diphenyl series. Part VIII. The nitration of 4 : 4'-difluorodiphenyl." By R. J. W. LE FÈVRE and E. E. TURNER.

"The validity of the interference method for the measurement of the specific area of a copper surface." By F. J. WILKINS.

"2-Arylcoumaranones." By W. BAKER.

"A revision of the atomic weight of tantalum. Determination of the ratios $TaBr_5 : 5Ag : 5AgBr$ and $TaCl_5 : 5Ag : 5AgCl$." By K. R. KRISHNASWAMI.

"The bromination of 2-nitro- and 2-acetamido-diphenyl ether." By H. MCCOMBIE, W. G. MACMILLAN, and H. A. SCARBOROUGH.

FORMS OF RECOMMENDATION FOR FELLOWSHIP. THE BALLOT WILL BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, MAY 1st, 1930.

BARKWORTH, EDMUND DAVID PATRICK, Flat 2, 4, Colville Square, Notting Hill Gate, W. 11. British. Research Chemist. B.A., Oxon. I desire to keep in touch with present-day developments in chemistry. (*Signed by*) A. A. W. Russell, C. N. Hinshelwood, N. V. Sidgwick.

BROADWAY, NORAH JANET, 16, Lodge Road, W. Croydon, Surrey. British. Student of Chemistry. B.Sc. (General), London, 2nd Class Hons., 1929. I wish to attend meetings of the Society and receive the Journal. (*Signed by*) James F. Spencer, Ernest S. Hedges, Z. Kamil.

COYSH, REGINALD HENRY, 7, Cannon Close, Raynes Park, S.W. 20. British. Assistant Lecturer in Chemistry. M.Sc. (Bristol). Present position : Assistant Lecturer in Chemistry, Battersea Polytechnic. (*Signed by*) J. Kenyon, T. Heap, F. Bell.

DANIELS, JOHN HENRY, 4, Mill Lane, Wallasey, Cheshire. British. Chemical Engineering Assistant, Wallasey Corporation, Gas and Water Dept. Regularly trained as a Gas and Water Engineer, including three years' laboratory and control. Associate Member of the Chartered Institute of Gas Engineers. Higher National Certificate, Gas Engineering (Institute of Gas Engineers); Ordinary National Certificate (Institute of Mechanical Engineers); School Leaving Certificate (Credits in Physics and Chemistry); Final Grade Certificate, Gas Engineering (City and Guilds of London); Earl of Derby Prize, Engineering and Design. (*Signed by*) A. E. Findley, Thomas J. Roberts, Andrew J. Myles.

DIAMOND, DOROTHY MARY, "South View," Langton, Tunbridge Wells, Kent. British. Student of Chemistry. I wish to attend the meetings of the Society and to receive the Journal. (*Signed by*) James F. Spencer, Ernest S. Hedges, Z. Kamil.

HICKSON, LOUIS ROBERT, 19, The Cambridge Road, N. 17. British.

Chief Chemist, Messrs. Hadfields (Merton), Ltd. B.Sc. (Hons.), London (East London College). A.I.C. Lecturer (Nitrocellulose Lacquers), The Polytechnic, Regent Street. Contributor to *Annual Reports on Applied Chemistry* (1929), Cellulose Ester Varnishes and Enamels Sections. Four years' laboratory and works control experience, Messrs. Hadfields (Merton), Ltd., Mitcham, Surrey. *J.C.S.*, 1925, **127**, 2544 (in conjunction with J. H. Carrington and W. H. Patterson). (*Signed by*) Louis A. Jordan, J. O. Cutter, Herbert H. Hughes.

LLOYD, IVOR, 8A, Chip Street, Clapham, S.W. 4. British. Consulting Metallurgist. Managing Director of Expert Tool and Case-hardening Co., Ltd., specialising in the scientific treatment of steels and non-ferrous metals for aircraft and automobile industry. (*Signed by*) J. C. Crocker, F. H. Lowe, C. Dorée.

MIDDLETON, ARTHUR WILLIAM, 27, St. Bernard's Road, East Ham, E. 6. English. Chemist. B.Sc., Special, London (2nd Class Chemistry). Analyst, Messrs. Yardley & Co. Assistant Chemist (Research and Analytical), Allen and Hanbury's, Ltd. (*Signed by*) A. M. Ward, Henry J. S. Sand, F. G. Kny Jones.

MORGANS, WILFRED MORLEY, Charman Dene, Cromwell Avenue, Cheshunt, Herts. British. B.Sc. (Wales). Organic Chemistry Research Student, University College, London. (*Signed by*) Robert Robinson, William Bradley, K. N. Menon.

MURRAY, MARGARET MARY, 42, Wilton Crescent, Wimbledon, S.W. 19. British. Lecturer in Biochemistry. B.Sc. and M.Sc., London. Recognised Teacher in the University of London in Biochemistry. Papers in *Biochem. Journal*, 1924 and 1925; *Journal of Physiology*, 1924, 1926–27, and 1928. (*Signed by*) Eustace E. Turner, Rosalind Henley, Mary S. Lesslie.

NANJI, HOMI RUTTONJI, Modi Minar, Parel Road, Bombay, 12; and 48, Penywern Road, S.W. 5. Parsi (Indian). Research Student. Working for the Ph.D. degree (London) in the Imperial College of Science. B.Sc. (First), University of Bombay. Holding a Research Scholarship of the University of Bombay. (*Signed by*) G. A. R. Kon, Arnold Stevenson, R. P. Linstead.

OLDHAM, WILLIAM DALES, 22, Edenhall Avenue, Levenshulme, Manchester. British. Works Chemist. University of Manchester Certificate in Chemical Technology. Associateship of the College of Technology, Manchester. Part-time Demonstrator in Bacteriology at the College of Technology, Manchester. (*Signed by*) T. K. Walker, W. H. Brindley, O. Rhys Howell.

ORR, WILFRED BEAUMONT, 212, Upper Newtownards Road, Bloomfield, Belfast. British. Assistant Lecturer in Chemistry, University College, Hull. D.Sc. (Belfast); Ph.D. (Durham). Formerly Senior Assistant in Chemistry, Queen's University, Belfast, and D.S.I.R. student. *J.C.S.*, 1927, 740. (*Signed by*) F. G. Tryhorn, A. W. Stewart, H. Graham, J. K. Marsh.

PRICE, DONALD, 37, Grange Road, Cambridge. American. Research Student, Cambridge University. A.B., M.A., Ph.D. (Columbia). Assistant in Chemistry, Columbia University, New York, 1925–28; Du Pont Fellow in Chemistry, 1928–29; Member American Chemical Society since 1926. (*Signed by*) T. M. Lowry, Brynmor Jones, R. C. Traill.

RAMANUJAM, PUNDI RANGA, 18, Gloucester Road, Kew, Surrey. British Indian. Student. B.A. (Hons.), Madras University. Research Student in the Imperial College of Science and Technology. (*Signed by*) James C. Philip, H. J. T. Ellingham, A. Vasundhara.

RAYBOULD, WILLIAM EDWARD, 30, Station Street, Sutton Coldfield, Bir-

mingham. British. Works Chemist. B.Sc. (Hons.), Birmingham University; Associate of the Institute of Chemistry. Works Chemist, Messrs. Morris & Shaw, Ltd., nr. Tamworth. (*Signed by*) A. W. Knapp, W. N. Haworth, S. R. Carter, Wm. Wardlaw.

RICHARDSON, CHARLES BENJAMIN WALTER, 133, Inverness Terrace, Bayswater, W. 2. British. Research Chemist. B.Sc., London. Six years with Messrs. Hadfields (Merton), Ltd., as Chemist. Three years at the Paint Research Station (Teddington). Research in paint technology. (*Signed by*) L. A. Jordan, J. O. Cutter, G. M. Hamilton, C. W. H. Story.

SNELL, FOSTER DEE, 130, Clinton Street, Brooklyn, N.Y. American. Consulting Chemist. B.S., Colgate, 1919; A.M., Columbia, 1922; Ph.D., Columbia, 1923. Teaching Technical Chemistry, Pratt Institute, five years (1923–28). Publications: Book Colorimetric Anal., 1921. Various papers on rayon, treatment of trade waste, and other subjects. (*Signed by*) M. L. Crossley, Arthur D. Little, Marston T. Bogert.

THORNE, WALTER FREDERICK, 4, Langley Road, Branksome, Bournemouth. British. Chemist. B.Sc., London (External), 2nd Class Honours Chemistry. I have been a Chemist to the Bournemouth Gas and Water Company for nearly six years. (*Signed by*) E. A. Seeley, M. A. M. Penrose, Philip G. G. Moon.

TOMKINSON, FREDERIC ERIC, "Eirianfa," St. Asaph, Flintshire, North Wales. British. Schoolmaster. B.Sc., 1st Class Honours in Chemistry, Liverpool University; M.A., Liverpool; Sheridan Muspratt Research Scholar. At present, and since February 1927, Chemistry Master at the St. Asaph Grammar School, North Wales. (*Signed by*) E. C. C. Baly, F. C. Guthrie, J. T. Nance, I. M. Heilbron.

WAINE, ALLAN COLEY, Ellesmere, Anchorage Road, Sutton Coldfield, Birmingham. British. Research Chemist, University of Birmingham. B.Sc. (Hons.), Birmingham. In order to keep in touch with the latest developments in chemical research. (*Signed by*) W. N. Haworth, H. D. K. Drew, Wm. Wardlaw.

WALTON, ERIC, 15, Avenue Gardens, Teddington, Middlesex. British. Research in Chemotherapy Section, Chemical Research Laboratory, Teddington. B.Sc. (Hons. Chem.), M.Sc., Ph.D. (University of Durham). Nearly three years research at Armstrong College, Newcastle-on-Tyne. College Research Student, 1928–29. *J.C.S.*, 1928, 723; 1929, 2368. (*Signed by*) G. R. Clemo, R. D. Haworth, G. T. Morgan.

WALTON, RONALD SOUTHERN, The Ranelagh School, Athlone, I.F.S. English. School Science Master. Graduate (2nd Class Honours in Chemistry) of Durham University, and wishing to keep in touch with recent advances in chemistry. (*Signed by*) Irvine Masson, C. W. Gibby, G. H. Christie, W. A. Waters.

WHITAKER, ALFRED HAROLD, 131, Holmleigh Road, Stamford Hill, N. 16. British. Chief Chemist, Dry Colour Dept., Lewis Berger. I desire to be considered for Fellowship in order to study all recent developments of chemical science. My own work has comprised original research on pigmentary dyes, *e.g.* Hansa yellows, permanent red series, and on intermediates (nitrotoluidines, and various sulphonic acids). (*Signed by*) William Baird, Louis A. Jordan, G. M. Hamilton, J. O. Cutter.

WILLIAMS, ROBERT DAVID, The Paint Research Station, Teddington, Middlesex. British. Research Chemist. B.Sc., Hons. (2nd Class); M.Sc. (Liverpool). I am engaged on research under the Research Association of British Paint, Colour, and Varnish Manufacturers, and desire to keep in

touch with modern developments. (*Signed by*) L. A. Jordan, J. O. Cutter, C. W. H. Story, G. M. Hamilton.

WILLIAMSON, JAMES, "Ivanhoe," Bilston Road, Aigburth, Liverpool. British. Manufacturing Chemist. M.P.S., Edinburgh. I am engaged in analytical work and control of manufacturing process in a wholesale chemical laboratory, and I desire to use the Library of the Society. (*Signed by*) John Rae, H. Humphreys Jones, J. E. Whipp.

YOUNG, ERIC ERNEST THOMAS, Elmhurst, Lonsdale Place, Derby. British. Student. To keep in touch with chemical progress. (*Signed by*) F. Stanley Kipping, F. C. Laxton, B. D. Shaw.

The following Forms of Recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2):

BORG, PAUL, Office of Agriculture, Malta, or 47, Marina via Misida, Sliema, Malta. Maltese (British subject). Plant Pathologist to the Malta Dept. of Agriculture. Pharmaceutical Chemist, University of Malta. Investigation on the wine-growing industry in Western Europe and Algeria on behalf of the Colonial Research Committee. (*Signed by*) H. W. Potts.

DĂNĂILĂ, H. Institute of Industrial Chemistry, Calea Masilor 132, Bucarest 1, Roumania. Roumanian. Professor and Director of the Institute of Industrial Chemistry. (*Signed by*) F. G. Donnan.

DAVIS, LIONEL STUART, Government Analyst's Department, Government Laboratory, Georgetown, Demerara, British Guiana. British. First Assistant Analyst. (*Signed by*) R. Robertson.

FRANCIS, WILLIAM, Government Analyst's Department, Government Laboratory, Georgetown, Demerara, British Guiana. British. Government Analyst, B.G. F.I.C. Desires to receive the publications of the Society. (*Signed by*) G. G. Henderson.

LONGINESCU, G. G., University of Bucarest, Str. V. A. Ureche 18, Bucarest 6, Roumania. Roumanian. Professor of Inorganic Chemistry. (*Signed by*) F. G. Donnan.

MCELVAIN, SAMUEL MARION, 2017, Adams Street, Madison, Wisconsin, U.S.A. American. Assoc. Professor of Chemistry, University of Wisconsin. B.S., Washington University (1920); M.A. and Ph.D., University of Illinois (1921 and 1923). The following publications: *J. Amer. Chem. Soc.*, **45**, 2739 (1923); **46**, 1721 (1924); **48**, 2179 (1926); **48**, 2239 (1926); **49**, 2835 (1927); **49**, 2862 (1927); **50**, 3348 (1928); **51**, 863 (1929); **51**, 887 (1929); **51**, 922 (1929); **51**, 3124 (1929); **51**, 3390 (1929). (*Signed by*) Homer Adkins.

ROBERTS, ROBERT CHESTER, Colgate University, Hamilton, N.Y., U.S.A. American. Head, Department of Chemistry, Colgate University. B.S., Ottawa University, Ottawa, Kansas; M.A., University of Kansas, Lawrence, Kansas; Ph.D., Yale University, New Haven, Conn. Teaching Assistant, Yale University, 1920–21. Professor of Chemistry, Franklin College, 1915–28. Professor of Chemistry and Head of Department, Colgate University, 1928 to date. "Action of Certain Acid Reagents on the Substituted Ureas and Thiazole," F. B. Dains, R. C. Roberts, and R. Q. Brewster, *J. Amer. Chem. Soc.*, **38**, 131–40; "Preparation of Derivatives of Diphenic Acid possessing the Properties of Local Anæsthetics," R. C. Roberts and T. B. Johnson, *ibid.*, **47**, 1396–1402 (1925). (*Signed by*) J. F. McGregory.

SEVERIN, EMIL, Industrial Section of the Polytechnic School, Bucarest,

Roumania. Roumanian. Head of the Industrial Section of the Bucarest Polytechnic School, and Professor of Chemistry. (*Signed by*) F. G. Donnan.

SHEWADE, VINAYAK YESHWANT, 80, Ada Bazar, Indore, Central India. Hindu (State subject). Chemical Engineer. B.Sc. in Chem. Eng., University of Illinois, U.S.A. Contribution to 8th International Congress of Applied Chemistry (Vol. 25, 355); special analytical and research work in coal–gas–tar–ammonia with Indiana Steel Co., Gary, Ind., U.S.A.; experience in leather manufacture with Woelfel Leather-Morris, Ill., U.S.A.; some time Member Amer. Chemical Society and Amer. Leather Chemists' Assoc.; Member Society of Chemical Industry; at present Chemical Engineer, Holkar State; experience in organising essential oil and pharmaceutical work; engaged in development of chemical and industrial resources of the State (in general); and hydrogenation of vegetable oils and its scope in the State (work in hand at present). (*Signed by*) S. S. Deshapande.

WESTMAN, ALBERT ERNEST ROBERTS, Ontario Research Foundation, 47, Queen's Park, Toronto 5, Ontario, Canada. Canadian. Director of Chemical Research. B.A., M.A., Ph.D. in Honour Chemistry, University of Toronto. Papers: *Trans. Amer. Electrochem. Soc.*, **43**, 171 (1923); **44**, 137 (1923); **46**, 205 (1924), etc.; *Journ. Amer. Ceramic Soc.*, **10**, 3, 133 (1927); **11**, 2, 82 (1928), etc.; Res. Assoc., Engin. Exp. Sta., Univ. of Illinois, 1924–28; Assoc. Prof. of Ceramics, Rutgers, 1928–29. (*Signed by*) W. Lash Miller.

ADDITIONS TO THE LIBRARY.

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From the Publishers: Revue d'Optique théorique et instrumentale.

CANADA. *National Research Council.* Canadian Journal of Research. Vol. I, etc. Ottawa 1929 +. (*Reference.*)
From the Director.

CEMENT AND CEMENT MANUFACTURE. The international cement journal. Vol. III, etc. London 1930 +. (*Reference.*)
From the Editor.

DAVIDSOHN, ISSER. Lehrbuch der Seifenfabrikation. Berlin 1928. pp. xxiv + 731. ill. *M*. 39. (*Recd.* 25/2/30.)

DENHAM, HENRY GEORGE. An inorganic chemistry. 2nd edition. London 1930. pp. viii + 688. ill. 12*s*. 6*d*. net. (*Recd.* 8/3/30.) From the Publishers: Messrs. Edward Arnold & Co.

DURRANS, THOMAS HAROLD. Solvents. (Monographs on Applied Chemistry.) London 1930. pp. xvi + 144. 10*s*. 6*d*. net. (*Recd.* 13/3/30.) From the Publishers: Messrs Chapman & Hall.

FRITZ, FELIX. Sechzig Jahre Linoleumfabrikation. (From *Seifenseider Zeitung*, 1924.) pp. 98. ill. (*Recd.* 25/2/30.)

GRAEFE, EDMUND, [and others]. Einführung in die chemische Technologie der Brennstoffe. Dresden 1927. pp. viii + 197. ill. *M.* 10. (*Recd.* 25/2/30.)

HOLMYARD, ERIC JOHN. Inorganic chemistry: a text-book for schools and colleges. London [1922]. pp. xii + 560. ill. 6*s.* 6*d.* net. (*Recd.* 3/3/30.)

—— Outlines of organic chemistry. London [1924, reprinted] 1928. pp. xii + 468. ill. 7*s.* 6*d.* net. (*Recd.* 3/3/30.)

—— An elementary chemistry. 2nd edition. London [1927]. pp. viii + 430. ill. 5*s.* net. (*Recd.* 3/3/30.)

From the Publishers: Messrs. Edward Arnold & Co.

INSTITUTION OF ELECTRICAL ENGINEERS. Journal. Vol. LXVIII, etc. London 1929 +. (*Reference.*).

From the Faraday Society.

ISTITUTO BIOCHEMICO ITALIANO. Archivio. Vol. I, etc. Milan 1929 +. (*Reference.*) From the Biochemical Society.

NATIONAL BENZOLE ASSOCIATION. Standard specifications for benzole and allied products, 1929. London 1929. pp. xiv + 145. ill. (*Reference.*). 6*s.* net. From the Association.

RETAIL CHEMIST, The. Vol. I, etc. London 1930 +. (*Reference.*)

From the Editor.

SOCIETY OF CHEMICAL INDUSTRY OF VICTORIA. [Proceedings.] Vol. XXVII, etc. Melbourne 1927 +. (*Reference.*)

From the Editor.

SPACKMAN, CHARLES. Some writers on lime and cement, from Cato to the present time. Cambridge 1929. pp. xviii + 287. (*Reference.*) 15*s.* net.

STANISLAUS, IGNATIUS VALERIUS STANLEY, and MEERBOTT, P. B. American soap maker's guide. An up to date treatise on the art and science of the manufacture of soaps, candles and allied preparations. [New York 1929.] pp. xii + 709. ill. 50*s.* net. (*Recd.* 25/2/30.)

SUPINO, OSCAR. Acido solforico e superfosfati minerali. Milano 1930. pp. viii + 253. ill. (*Recd.* 25/2/30.)

UNITED STATES. *Department of Commerce.* Bureau of Standards Technologic Paper No. 112. Standardization of the Saybolt universal viscosimeter. By WINSLOW H. HERSCHEL. Washington 1918. pp. 25. (*Reference.*)

—— —— —— Technologic Paper No. 170. Pyrometric practice. By PAUL D. FOOTE, C. O. FAIRCHILD, and T. R. HARRISON. Washington, 1921. pp. 326. ill. (*Reference.*) From Mr. H. M. Spiers.

II. *By Purchase.*

ANSCHÜTZ, RICHARD. August Kekule. 2 vols. Berlin 1929. pp. xxiv + 708. xvi + 960. ill. *M.* 120. (*Recd.* 19/2/30.)

ARNDT, KURT. Technische Elektrochemie. Stuttgart 1929. pp. xvi + 708. ill. *M.* 55. (*Recd.* 19/2/30.)

CALVERT, ROBERT. Diatomaceous earth. (American Chemical Society Monograph Series.) New York 1930. pp. 251. ill. 21*s.* net. (*Recd.* 20/2/30.)

DENNIS, LOUIS MONROE, and NICHOLS, MELVIN L. Gas analysis. Revised edition. New York 1929. pp. xx + 499. ill. 17*s.* net. (*Recd.* 20/2/30.)

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GRUBE, GEORG. Grundzüge der theoretischen und angewandten Elektrochemie. 2nd edition. Dresden 1930. pp. xii + 495. ill. *M.* 30. (*Recd.* 19/2/30.)

HAAS, ARTHUR. Materiewellen und Quantenmechanik. 3rd edition. Leipzig 1930. pp. viii + 202. ill. *M.* 8. (*Recd.* 13/3/30.)

HUBBARD, C. C. Drycleaning and redyeing handbook: including laboratory practice, formulas, tests and tables. Silver Spring, Md. 1929. pp. xii + 252. 20*s.* net. (*Recd.* 25/2/30.)

MCCOLLUM, ELMER VERNER, and SIMMONDS, NINA. The newer knowledge of nutrition. 4th edition. New York 1929. pp. xiv + 594. ill. 21*s.* net. (*Recd.* 8/3/30.)

PARKES, LOUIS COLTMAN, and KENWOOD, HENRY RICHMOND. Hygiene and public health. 8th edition. Revised by H. R. KENWOOD and HAROLD KERR. London 1929. pp. xii + 823. ill. 21*s.* net. (*Recd.* 20/2/30.)

RUEDY, RICHARD. Bandenspektren auf experimenteller Grundlage. Braunschweig 1930. pp. vi + 124. *M.* 9.60. (*Recd.* 14/3/30).

SOCIETY OF RHEOLOGY. Journal of Rheology. Vol. I, etc. Easton Pa., 1929 +. (*Reference.*)

SPENCER, GUILFORD LAWSON. A handbook for cane-sugar manufacturers and their chemists. 7th edition. By GEORGE P. MEADE. New York 1929. pp. xx + 560. ill. 30*s.* net. (*Recd.* 20/2/30.)

STANDARDIZATION OF TAR PRODUCTS TESTS COMMITTEE. Standard methods for testing tar and its products. London 1929. pp. xxx + 295. ill. 7*s.* 6*d.* net. (*Recd.* 25/2/30.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Extra Meeting held at the Salters' Hall, St. Swithin's Lane, E.C.2 on Wednesday, March 26th, 1930, at 5.30 p.m., the President, Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., in the Chair.

The PRESIDENT called upon Professor Dr. G. von Hevesy to deliver the fifth Hugo Müller Lecture entitled " The Chemistry and Geo-chemistry of the Titanium Group."

At the conclusion of the lecture, a vote of thanks to Professor G. von Hevesy was proposed by Dr. N. V. Sidgwick, seconded by Professor Arthur Smithells, and carried with acclamation, Professor Hevesy making acknowledgment.

The PRESIDENT expressed the thanks of the Society to the Master, Wardens and Court of the Salters' Company for the privilege of holding the Hugo Müller Lecture in their Hall.

ANNIVERSARY DINNER.

The Anniversary Dinner of the Chemical Society was held at the Hotel Victoria (King Edward VII Rooms) on Thursday, March 27th, 1930, at 7 for 7.30 p.m. The President, Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., was in the Chair, and the following Fellows, with their guests, numbering 216, were present:

Armstrong, Miss N.
Austin, P. C.
Austin, R. G.
Baker, H. B., C.B.E., F.R.S., *Past-President.*
Baker, Mrs. H. B.
Balaban, I. E.
Balaban, Mrs. I. E.
Baly, E. C. C., C.B.E., F.R.S.
Baly, Mrs. E. C. C.
Bennett, Miss D. M.
Bolton, E. R.
Borns, H.
Bowsher, R.
Bragg, Sir William H., K.B.E., F.R.S.
Bramley, A.
Bramley, Mrs. A.
Brooke, R. W.
Bryans, Frank.
Buckle, E. A.
Buckle, Mrs. E. A.
Bunker, S. W., D.S.O., M.C.
Burch, W. J. N.
Calvert, H. T., M.B.E.
Calvert, Mrs. H. T.
Campkin, H. T.
Caney, J. G.
Caney, Mrs. J. G.
Carlton, Miss M.
Carr, S. E., *Assistant Secretary.*
Challenger, F.
Challenger, Mrs. F.
Chapman, A. Chaston, F.R.S.
Chapman, Mrs. A. Chaston
Chapman, A. W.
Chibnall, A. C.
Chorlton, Alan, *Vice-President, The Institution of Mechanical Engineers.*

Clayton, G. C., C.B.E., *President, The Institute of Chemistry.*
Clemo, G. R.
Clifford, F. W., *Librarian.*
Coates, J. E., O.B.E.
Colwyn, Right Hon. Lord, P.C.
Corder, Rev. B. J.
Corder, Mrs. B. J.
Corder, Miss.
Corsellis, D. H.
Coste, J. H.
Coste, Mrs. J. H.
Coste, Miss.
Coste, J. H., jun.
Crowther, E. M.
Daily Telegraph, The
Donald, Miss G. H.
Donald, M. B.
Donald, Mrs. M. B.
Donnan, F. G., C.B.E., F.R.S., *Foreign Secretary.*
Donnan, Miss J. E.
Drakeley, T. J.
Drakeley, Mrs. T. J.
Drummond, J. C.
Dudley, H. W., O.B.E.
Dunn, J. T., *President, The Society of Public Analysts.*
Dunstan, A. E., *President, The Institution of Petroleum Technologists.*
Dyer, Bernard.
Dyer, Mrs. B.
Eastman, Cyril, *President, The Society of Dyers and Colourists.*
Eldridge, A. A.
Eldridge, Mrs. A. A.
Elkington, H. Douglas.
Ellingham, H. J. T.
Evans, C. Lovett.
Eyre, J. Vargas.
Eyre, Mrs. J. V.
Farmer, E. H.
Farmer, R. C.
Fisher, Miss N. I.
Freeth, F. A., O.B.E., F.R.S.
Garner, F. H.
Garner, W. E.
Gates, Percy, *President, The Institute of Brewing.*
Gibson, C. S., O.B.E., *Secretary.*
Goldsmith, J. N.
Gray, W. H.
Greenaway, A. J.
Greeves, A.
Gunn, A. Rugg.
Haas, Paul.
Hamer, F. E.
Hamer, Miss F. M.
Hamer, S. H.
Hamer, Sir William, Kt.
Harden, A., F.R.S.
Haskew, R. S.
Haskew, Mrs. B. C.
Hele, T. Shirley, *Chairman of Committee, The Biochemical Society.*
Henry, T. A., *Vice-President.*
Henry, Mrs. T. A.
Hevesy, G. von, *representing the Deutsche Chemische Gesellschaft.*
Hill, C. A., *Vice-President, The Association of British Chemical Manufacturers.*
Hinks, E., M.B.E.
Hooker, Mrs. A. H.
Hooper, D.
Hope, E.
Hopkins, Sir F. Gowland, Kt., F.R.S.
Hopkins, Lady.
Hunt, Miss.
Ingold, C. K., F.R.S.
James, T. C.
Jowett, H. A. D.
Jowett, Mrs. H. A. D.
Keen, W. B.
Kenner, J., F.R.S.
King, H.
King, Mrs. H.
Leitch, Miss G. C.
Le Pla, Miss M., *Indexer.*
Lessing, R.
Lessing, Mrs. R.
Levinstein, H., *President, The Society of Chemical Industry.*
Levinstein, Mrs. H.
Linstead, R. P.
Louis, Henry, *President, The Iron and Steel Institute.*
Lowndes, J.
Lowry, T. M., C.B.E., F.R.S., *President, The Faraday Society.*
Lund, Kenneth F.
McCombie, H., D.S.O., M.C.
Maclean, H.
Maclean, Mrs. I. S.

Macnab, W., C.B.E.
Mallen, Miss C. E.
Menzies, R. C.
Miall, S.
Micklethwait, Miss F. M. G., M.B.E.
Micklethwait, R. G.
Milne-Watson, Sir David, Kt., *President, The Institute of Fuel.*
Mills, W. H., F.R.S., *Vice-President.*
Mitchell, A. D., *Assistant Editor.*
Mitchell, Mrs. A. D.
Moore, T. S., *Secretary.*
Moore, Mrs. T. S.
Morris, H. J.
Napier, O. J. W.
Napier, Mrs. O. J. W.
Newbery, A. D.
Nierenstein, M.
Osman, A. A.
Paget, H.
Parker, A.
Parker, Mrs. A.
Parry, L. Moreton, *President, The Pharmaceutical Society.*
Pentreath, Rev. G.
Pentreath, Mrs. G.
Perkin, A. G., F.R.S.
Philip, J. C., O.B.E., F.R.S., *Vice-President.*
Philip, Mrs. J. C.
Philip, W. E.
Plenderleith, H. J., M.C.
Plenderleith, Mrs. H. J.
Plimmer, R. H. A.
Plimmer, Mrs. R. H. A.
Pownall, Mrs.
Price, T. Slater, O.B.E., F.R.S., *Treasurer.*
Pyman, F. L., F.R.S., *Vice-President.*
Raistrick, H.
Raistrick, Mrs. H.
Rawling, S. O.
Reavell, J. Arthur, *President, The Institution of Chemical Engineers.*
Rintoul, W., O.B.E.
Robertson, A.
Robertson, Mrs. A.
Robertson, Sir Robert, K.B.E., F.R.S., *Treasurer, The Royal Institution.*
Robertson, Lady.
Robinson, R., F.R.S.
Robinson, Mrs. R.
Rowe, F. M.
Rowe, Mrs. F. M.
Rowlands, M. J.
Sanderson, J.
Scott, Alexander, F.R.S., *Past-President.*
Seligman, R., *President, The Institute of Metals.*
Seligman, Mrs. R.
Sharp, T. M.
Sidgwick, N. V., O.B.E., F.R.S.
Simonsen, J. L.
Simonsen, Mrs. J. L.
Smith, Clarence, *Editor.*
Smith, F. E., C.B., C.B.E., Sec.R.S., *Secretary, Advisory Council, Department of Scientific and Industrial Research.*
Smith, T. B.
Smithells, A., C.M.G., F.R.S., *Vice-President, The Institute of Chemistry.*
Solomon, W.
Sommerville, David.
Spencer, J. F.
Spielmann, P. E.
Thomas, R. N. Garrod.
Thorpe, J. F., C.B.E., F.R.S., *President.*
Thorpe, Mrs. J. F.
The Times.
Topley, W. W. C.
Topley, Mrs. W. W. C.
Turner, Miss E. G.
Turner, G. W.
Vernon, W. H. J.
Voelcker, J. A., C.I.E.
Voelcker, Miss W.
Wargrave, Right Hon. Lord, P.C., *Prime Warden, The Goldsmiths' Company.*
Whiteley, M. A., O.B.E.
Whitmarsh, W.
Wiese, L.
Wiese, Mrs. L.
Wiese, Miss.
Wilson, Sir Arnold T., K.C.I.E., C.S.I., C.M.G., D.S.O.
Wilson, F. J.
Woolcock, W. J. U., C.B.E.
Worsley, Mrs. G. le Geyt.
Wynne, W. P., F.R.S., *Past-President.*
Young, F. G.

*

The following Toasts were proposed :

1. The King.

2. The Queen, the Prince of Wales, and the other Members of the Royal Family.

3. " The Chemical Society," coupled with the name of the President. By SIR DAVID MILNE-WATSON, Kt., M.A., LL.D., D.L., President of the Institute of Fuel.

4. " The Central Building," coupled with the name of SIR ARNOLD T. WILSON, K.C.I.E., C.S.I., C.M.G., D.S.O. By DR. HERBERT LEVINSTEIN, M.Sc., F.I.C., President of the Society of Chemical Industry.

5. " The Guests," coupled with names of :

(*a*) Professor DR. GEORG VON HEVESY, representing the Deutsche Chemische Gesellschaft.

(*b*) CHARLES A. HILL, Esq., B.Sc., F.I.C., Vice-President of the Association of British Chemical Manufacturers. By A. CHASTON CHAPMAN, Esq., F.R.S., F.I.C.

After the Loyal Toasts had been honoured, SIR DAVID MILNE-WATSON, in proposing the toast of " The Chemical Society," said :

" I consider it a very great honour indeed that I have been asked to propose the toast of the evening, namely, that of the Chemical Society. I am no chemist myself. The only claim to chemistry that I have is that I have been, and still am, President of the Association of British Chemical Manufacturers and I am also the head of a Company which manufactures a large number of chemicals.

" I admit that for to-night I have no prepared speech, but I have found, at any rate, that the chemists amongst your members are very human. When I came into the room to-night I said to Professor Smithells, ' I have no prepared speech,' and he offered to sell me one—at a price ! Well, to be serious, I am glad to propose this toast, for I have a very great admiration for the splendid record of work done by the Society, which has been honoured by many great names, such as Lord Playfair, Sir William Ramsay and the two Professors Perkin. These last names have had a very great interest for the industry with which I am connected. It is a great regret to think that Professor W. H. Perkin is no more with us to take an interest in your affairs.

" For your work I am full of admiration. Your Secretary provided me a day or two ago with some details about that work, but far be it from me to inflict them upon you to-night. He told me the exact number of words the *Journal of the Chemical Society* contained. It ran into hundreds of thousands, most of which, I believe, have

been written by your worthy President. I was positively staggered. Then I found that you have published a number of valuable research abstracts. I cannot imagine any more useful work that you do than that of publishing those abstracts. They also ran into thousands of words, but they were obviously not all written by my friend Professor Thorpe. Joking apart, however, I do consider that the money which your Society spends in publishing these contributions is very well spent indeed. It is increasingly difficult for all who are engaged in industry and science to keep abreast of the times. I realise, as the head of a business such as the one I am connected with, how difficult it is to know what is going on in the world of science, and I consider that your Society is rendering an enormous service to us in industry and to all those who are engaged in technical work by these publications. My feeling about chemistry is that unless you are absolutely up-to-date it is no use at all. I have recollections of paying visits to chemical works where I saw white elephants in the shape of plant. You have not to go very far to find plants which have been erected only a year or two too late. Had the management had the courage to put them up sooner, or had they only realised earlier the advantages of some great discovery, they might have made a fortune, but a few months or a few years later there was no profit in it. I remember one particular chemical substance which we used to make and sell with great profit at four shillings a pound. Within a few months we were very glad to get three-halfpence a pound for that substance. That is what is happening in all directions in the chemical world. Unless you are really first in the field, and prepared to take advantage quickly of any new discovery, you probably find that you are too late.

"In an assembly of this kind it would be perfectly ridiculous of me to extol the merits of chemistry. You live in it, you have your being in it, you make your daily bread by it, and you no doubt regard it as the most important thing in the world. But as a layman in your midst I do say, without fear of contradiction, that there is no doubt that in chemistry lies the solution of a great many of the problems that face mankind. Whatever may happen, there is no doubt that in the future chemistry will play a greater part in supplying the wants of mankind. In the industry in which I am engaged we know that quite well, because we produce many by-products. We see synthetic industries springing up everywhere, and so we see any chance of producing those by-products at a profit disappearing. It is the natural current of events, and mankind will benefit by the cheapening of products required for daily necessities. I do not think there is

any need for me to amplify that subject any further, or to say more than that I believe all of you are convinced that chemistry is important and that your Society is one of the greatest influences in this country.

"It only remains for me to ask you to drink to the prosperity of the Chemical Society, coupling with the toast the name of my friend Professor Thorpe. He needs no words of commendation from me. He is one of the mainstays of the Chemical Society and the chemical industry generally. Those of us who know him are very fond of the Professor, and we are very glad to see him in this position to-night. We wish the Society all success and all prosperity in its work."

The PRESIDENT, in responding, said :

"Before replying to the very kind speech which Sir David Milne-Watson has made, there are a few matters in connection with the affairs of the Society to which I should like to call your attention.

"Although it is not my task to propose the toast of the guests—that is in other and more competent hands—I do want to express our thanks to certain of the guests who are with us to-night, and especially to Professor von Hevesy, to whose admirable lecture yesterday we listened with the greatest interest. Unfortunately—I say unfortunately advisedly—he is the one surviving member of a very distinguished band, because we had hoped to have with us at this dinner all our new German members. For one reason or another they were unable to come, and we therefore asked the German Chemical Society to send a representative who could speak on their behalf, and they sent Professor von Hevesy. I have here many letters from those foreign members explaining the reasons for their absence. We have with us, however, the Nobel Laureates, Sir F. Gowland Hopkins and Professor A. Harden, whom we are exceedingly glad to welcome, and we congratulate them on the high honour bestowed on them and bestowed also, I think we may justly claim, on chemistry. I would also like to welcome Mrs. Hooker, representing Mr. A. H. Hooker, who has recently given us a very valuable acquisition which for many years to come will be carefully guarded. I am sorry to say that Mr. Hooker has had to undergo an operation, and we shall all wish to convey to him through Mrs. Hooker our great sympathy and our best wishes for a speedy recovery. To-night we have with us personally a number of members of the constituent bodies who are combined together in the central building project. Again it is not my business to deal with the central house, because that is a special toast in itself, but I should like to say how glad we are to see them

here to-night and to welcome them, because we regard this as a great augury for the future.

"We ourselves have to leave our premises in Burlington House because we have outgrown them. We cannot expand further without bursting out the walls. A change is inevitable, and we have to face it. In that connection I may say that I am Chairman of the Appeal Committee and I have to go round gathering what substance I can. I am in the position of what I think physical chemists call an electron sink. I have to seek some electron in order that I may combine with him or it and produce a compound. Unfortunately, they are usually unsaturated compounds, and unsaturated compounds in the human sense are no use for the purpose. Moreover, we are likely to become more unsaturated from the human point of view as time goes on, and probably by the middle of next month we shall not only have parted with all our electrons, but they will come and take our protons as well. Be that as it may, the collection of funds is likely to produce a certain amount of difficulty in the near future. We as chemists are very loath to leave our admirable quarters in Burlington House, which we have occupied now for fifty-five years, and to go into other quarters in some far-away district such as Westminster, which is inhabited, I understand, mainly by engineers and politicians. However, I do not think the chemist will do any harm to the engineer, and the engineer is certain to do a great deal of good to the chemist. Whether the politician is likely to be improved by either I cannot say. I have been told that organic chemistry, the subject with which I deal, is a dead science. I have also been told, or at least I have read in the newspapers, that there is only one organic chemist left in England. I have never seen the corpse of organic chemistry, and I am not prepared to swear to its identity, and I think it is quite possible that those people who have recorded its death would not be in a position to recognise organic chemistry if they saw it. The mind stands appalled at the contemplation of such an awful picture as that of the last organic chemist in England watching the corpse of the dead science like, shall I say, some Robinson Crusoe. I will leave it at that.

"Nothing more remains for me but to thank you for the manner in which you have received the toast and Sir David Milne-Watson for the way in which he proposed it."

The toast of "The Central Building" was proposed by DR. HERBERT LEVINSTEIN, who said:

"I hope, ladies and gentlemen, that you will forgive me for

butting in with this toast and standing for a moment or so between you and Sir Arnold Wilson. It is indeed a great honour to have been entrusted with this toast, for which there is so much competition this evening. A central building appears to imply central heating, a topic that might at some time interest Chemists, and so the President of the Institute of Fuel would be a more suitable person than myself to propose it. It seems, however, a very unsubstantial topic. The fabric, being unsubstantial at the moment, has no interior, and therefore I suppose its health should be good. Having no interior—indeed no exterior—it can have no bacteria. When completed it will, I am sure, have no superior.

"Speaking as President of the Society of Chemical Industry, I should like, on behalf of that Society, to express our grateful thanks to the President of the Chemical Society for the very statesmanlike and constructive address which he delivered on the subject of closer co-operation between the various chemical societies. When I first knew your President he was a finished cricketer and a very promising organic chemist. He is now, I am sorry to say, a completely finished cricketer and a very finished but—as he has taken the trouble to tell us all to-night—a by no means completely finished organic chemist. I would like you to understand, ladies and gentlemen, that the scheme for co-operation between our great Societies is one on which no previous consultation between the Councils or the officials of the Societies took place. This is a scheme which is as new to me as it will be, no doubt, to all our members. But it is a scheme with which everyone who has the future of science and industry at heart will be most completely in sympathy and general agreement. There is no doubt whatever that a central building of the kind which was described to us this afternoon will be of vital importance both to our clients and also to the chemical industry.

"I will not take up your time by making a long speech on the subject, but I would like to call your attention to some aspects of it. In the first place, we have in the conduct and publications of our Societies to legislate and cater not only for the needs of chemists in this country, but also for the needs of British chemists in various parts of the Empire. It is of the highest importance that British publications should be those which are read by British chemists working in foreign countries and in various parts of the Empire, and that they should not be compelled, owing to lack of co-operation or lack of funds, to rely on the publications of other countries, however admirable those publications may be. For national and imperial reasons, therefore, I think that it is vital that chemists should be able to come to us here in London for

their publications rather than go to the great Societies in other countries.

"Then, ladies and gentlemen, we need here in London a meeting ground for chemists and industrialists from all parts of the Empire. The chemist or industrialist working in distant parts of the Empire takes his leave sooner or later and comes to London. At present there is no central building where he can consult with engineers and chemists working on lines similar to his own, although it is vital to him that he should be able to do so. From that point of view alone it is important that we should have a central building and a central library. For the chemist living and working in London the advantages of the scheme are obvious, but they are no less great to the chemists who live and work in the provinces, and who form the greater part, probably, of the members of the Society of Chemical Industry, and no doubt also of the Chemical Society. It is of great importance that there should be a central administration of our journals, leading to that reduction of costs and consequent reduction of subscriptions to which reference has been made by the President. I entirely agree with what he has said on that point, and its value to our members. In that connection may I say that it is with very great pleasure that I see Lord Colwyn not far from me. We are losing many members from the Society through the centralisation of factories and businesses, because in recent years it has become the practice for the young research chemist to go into the Works Library and consult current literature in the firm's time and at the firm's expense. Speaking with experience from both sides, I think that is an utterly improper use of Works Libraries. The Works Library should be equipped with works of reference which the chemist can use in connection with his work, but it is the business of the young chemist to keep abreast of the literature of the day in his own time and at his own expense. I am afraid there is too much of a tendency now to think that when five o'clock or five-thirty comes the day's work is over. Lord Colwyn and others will tell you that the chemical industry of this country and other countries was not built up on any idea of that kind. I hope, therefore, the heads of the great research organisations of this country will discourage chemists from using the Works Libraries for the purpose of reading the journals of the Chemical Society and of the Society of Chemical Industry, and encourage them to become members of those societies. I hope shortly there will be a joint membership, and that that will encourage chemists to keep abreast of progress in their profession in their own time and at their own expense.

"I have great pleasure in coupling with the toast the name of

Sir Arnold Wilson, the great protagonist of the scheme, though he only became associated with the chemical industry owing to the great war. Sir Arnold Wilson is one of the most interesting personalities in London. A soldier and a scholar—a soldier by profession, a scholar by instinct and inheritance—by nature a fighter. We are fortunate in finding him to carry through this scheme. I give you the toast of the 'Central Building,' coupled with the name of Sir Arnold Wilson."

Sir Arnold Wilson responded, saying :

"May I begin by thanking Dr. Levinstein for his kindly personal references, and ask your permission to say a few words about the central building scheme ?

"It deals with the great industries of this country—mining and metallurgy, chemistry, fuel, oil and rubber. Our object is to bring together not merely the technical societies connected with those great industries, but also, as tenants in the building and in the closest co-operation, the producing societies. We want to bring together not merely the chemical societies, but such organisations as the National Federation of Iron and Steel Manufacturers, the Mining Association of Great Britain and organisations of that character. It is my belief, speaking as a layman, that the economic position in this country will be facilitated by having the scientific and technical sides of industry more closely united with the manufacturing and selling sides.

"I should like to say a word or two in defence of the young chemist. The truth is that the young chemist cannot afford membership of all these societies. I have no doubt that he is a member of one, but not more than one, and my hope is that when this scheme is developed it will not be a question of whether you can afford to be a member, but whether you can afford not to be a member. There will be a great increase in membership in the long run.

"This is not simply a business scheme for getting twelve societies together. It is much more than that. Our hope is that when the new building is completed science as applied to industry will acquire a new and improved status. You will be close to Westminster, in close touch with the manufacturing side and in communication with each other. It will be no longer possible for the public at large to regard scientific men as a class apart. You will be far more closely in touch with the national life than you can be if you are scattered over a circuit of London almost as big as the Inner Circle. The effect of frequently meeting your colleagues in other branches of science and industry will be of great importance. The fact of meeting those who have to handle the products with which

you are so familiar will have a certain importance, and your proximity to Westminster will also have a certain importance. I hope that the façade of the building will represent something of the dignity of science. There can be no question that, as Dr. Levinstein, Sir David Milne-Watson and Professor Thorpe have all said, the scheme will be of great value to chemistry and of great value also to metallurgy and the various other industries, including rubber and fuel, connected with the scheme. I believe the scheme will be of great value to the nation, because Great Britain depends as no other nation in the world depends upon the successful application of science to industry. I can say that in two or three years' time, when you have this building in being, with its central library, the young chemist will be able to get much more for his money than ever before. By housing the twelve societies in one building and getting their libraries under one roof, it will be possible to convert them from reference libraries into lending libraries. That will be one of the benefits. Another result of co-operation and combination will be that the journals and abstracts will be in a form which will make it far easier for the young chemist, and for that matter for the old chemist, to find what he requires. In the new library there will be, I hope, a Bureau of Information, which will be able to provide a man with precisely what he requires in the minimum of time and without expense.

"Before I conclude my remarks, I want to thank those who have contributed so enormously to the initial success of this movement. First and foremost I should like to thank those firms and individuals who gave us substantial assistance and encouragement at the very beginning, when the whole success of the scheme hung in the balance. Secondly, I would say, although I should not like it to be spoken about outside or printed or published, that when this scheme began the chemists were not in it. It was not until the chemists came in that the scheme got a real move on. The extraordinary energy and enthusiasm of Professor Thorpe has resulted in the burden of the scheme being carried, not by me or by any individual, but by a little group of men who centre round Professor Thorpe. I am sure your imagination will be equal to evolving some chemical formula depicting Professor Thorpe as the embodiment of energy and at the same time the centre of a number of small but useful electrons. For all the secretarial work that has to be done, the hard work of getting people together and keeping correspondence in order is being done by your Assistant Secretary, and nobody else, and we owe a great debt to Mr. Carr. May I finally express my personal thanks, and I am sure the thanks of us all, to the newspapers who have given us so much of their valuable space and so

much intelligence. Whenever any reference has been made to this scheme for a central building they have given it gratifying and invaluable prominence. They did it, I believe, because they regarded the project as one of public importance. We are not trying to do anything which has not been done before. The United States of America have had a similar scheme, and Germany has its own Chemistry House. France has had no difficulty in getting a grant of a million and a half francs for the construction of the Maison de Chimie. Our own Chancellor of the Exchequer, I am sure, would far sooner see this scheme developed and brought to a successful conclusion by the individual efforts of the members of the Societies concerned and of those firms who benefit from the activities of the Societies. Do not let us be beholden to anybody else. Let us feel that we have built the temple ourselves alone. When this scheme is completed I am sure you will look back on this day, when for the first time your President has mentioned it and it has appeared on the Toast List, as being a memorable occasion."

MR. A. CHASTON CHAPMAN proposed the toast of the guests. He said :

" We cannot allow our guests to leave us without expressing to them our appreciation of the honour they have done us in accepting our invitation and of telling them how much they have added to our pleasure by their presence here to-night. I have, in a long experience of Dinner Committees, often heard it suggested that for some good reason this or that toast might be conveniently omitted, but never in the whole of my experience have I heard it suggested that the toast list should be shortened at the expense of the toast which it is my pleasure to present to you to-night.

" Much as I should like to refer individually to each of our guests, I feel sure you will realise that that is quite impossible, and if I do not, I hope that our guests will understand that this is due solely to pressure of time, and that we desire to extend to each the same friendly greeting and the same hearty welcome.

" In the first place, I would extend to the ladies who have honoured us by their presence here to-night a very warm welcome. We hope they have enjoyed our entertainment as much as we have enjoyed their company.

" Our list of guests is a long and very distinguished one, and it includes representatives of almost every branch of our science and of a considerable number of its more important applications.

" In Lord Colwyn we welcome one who represents, among his many and varied activities, a number of industries which are either

entirely chemical or in which chemical science plays an all-important and ever-increasing part. I think it may safely be said that there are very few persons who are better able to appreciate all that chemistry means to industry than Lord Colwyn, and, I may add, Sir David Milne-Watson, whom we are also happy to have with us to-night. Unfortunately, Lord Melchett was not able to accept our invitation to be present. If he had been here we should have had an illustrious trio.

" We have with us the reigning Presidents and other officers of a number of scientific and technical societies and institutions, many of which are constituent organisations in connection with our appeal for a central building devoted to chemistry. All these we are happy to welcome, not merely as our official guests, but also as our personal friends and colleagues, and I should like especially to refer to one of the latest of our Honorary Fellows, Sir William Bragg, Director of the Royal Institution, and friend of us all.

" Sir Frederick Hopkins and Prof. Harden come to us with the Nobel laurels fresh upon their brows. We are happy that these fellow-countrymen and old friends of ours should have received this high award, and we are especially gratified that the honour should have been paid to the representatives of one of the youngest branches of our science, but which is rapidly becoming one of the most important.

" The City Companies are represented by Lord Wargrave, the Prime Warden of the Goldsmiths' Company, and we are happy too to have with us representatives of the Civil Service and of Government Departments, as well as some leading Captains—or perhaps I ought rather to say Field-Marshals—of industry. To all these gentlemen I desire to offer on behalf of the Society a very hearty welcome, and to tell them how greatly we appreciate their presence with us to-night.

" On an occasion such as this we feel that our table is never complete unless we have with us one or more of our foreign colleagues. To-night we are very happy to be able to welcome Prof. von Hevesy. Not to everyone is it given to discover a new element, but this and other outstanding contributions which Prof. von Hevesey has made to chemical science are so well known to you that any further reference is quite unnecessary, even if this were an appropriate occasion. I will content myself with saying that we consider ourselves very fortunate that Prof. von Hevesy, who is representing the Deutsche Chemische Gesellschaft, should have found it possible to dine with us to-night, and we desire to welcome him not only as a very distinguished colleague, but as one

who knows us well and who numbers many Englishmen among his personal friends. We hope he will take back with him very pleasant memories of his visit.

"We welcome in Mr. C. A. Hill one who has rendered yeoman service to chemical industry. Mr. Hill is an old friend of most of us, and all who know him will agree that he combines in his person the qualities of a man of science with those of an outstanding organiser and administrator, a combination which is by no means very common. The fact that Mr. Hill is Vice-President of the Association of British Chemical Manufacturers is sufficient evidence of the position he occupies in the world of manufacturing chemistry, and I should just like to express to him the gratitude which all chemists must feel for the very active part he played in connection with the manufacture of fine chemicals. He has done, in fact, very much to render us to a great extent independent of foreign analytical and research chemicals.

"We hope that all our guests have spent a very pleasant evening, and I ask you to drink to their healths."

PROFESSOR DR. GEORG VON HEVESY, responding, said :

"I want to thank you, Mr. President, and the Council of your Society, most warmly for your kind invitation. I have spoken to a number of my friends in Germany about this occasion, and they were all unanimous that no Society could arrange so well a festive gathering. Every foreign visitor comes to such a gathering as this with the greatest pleasure. Whenever I have asked my friends who have been to London what struck them most, the answer has always been that in London they saw the capital of Parliamentarianism. There were some who associated London with the great financial centre of the world, but I, in coming to London, think of the great British chemists. It is unnecessary to recall that the German Chemical Society was founded on exactly the same lines as your own Society, and I was asked by the President and Council of my Society to bring you their best greetings and their most sincere wishes for your future. The recent visits of Sir Ernest Rutherford and of your President and Senior Secretary were a source of especial pleasure and gratification to us. You have had great names in the past—Sir William Ramsay, Professor Perkin and others—but no one perhaps who did so much for the fundamental interest of chemistry as Sir Ernest Rutherford. I am sure that the Chemical Society will maintain its great traditions."

MR. CHARLES A. HILL, who also responded, said :

"More than one of the speakers to-night has referred to the part

which chemical manufacturers play in the industrial world to-day. I have been privileged within the past week to be present as a humble spectator and listener at a discussion on chemical catalytic reactions under high pressure, and no one who heard that discussion could have been left in any doubt as to the essential 'oneness' of the problem of the fundamental nature of all chemical reactions. As contributors to the discussion, we had scientific professors recounting their work in their laboratories, chemical industrialists tackling the same problems in large-scale operations. No one can doubt that there is only one chemistry, and that is chemistry. On behalf of chemical manufacturers I would say that we understand the debt which the present generation owes, and that all posterity will owe, to scientific discoverers; and we also appreciate the part which you, Mr. President, Sir Arnold Wilson, and the other prime movers or lubricants or whatever they are are playing in the project for Central House. That project, when it is accomplished, will, we trust, help to abolish the artificial barrier which has existed for too long between what is called 'pure chemistry' and what is called 'applied chemistry.' May I, on behalf of the guests, express our deep appreciation of the hospitality which you have extended to us this evening and our gratitude for your kindly thought in welcoming us by a special toast?"

Ordinary Scientific Meeting, Thursday, April 3rd, 1930, at 8 p.m., the President, Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death on March 26th, of Frederick William Tompson, who was elected a Fellow of the Society on February 26th, 1884.

It was announced that the following Committees for 1930–1931 had been appointed by the Council:

Finance Committee: J. L. Baker, F. P. Dunn, C. A. Hill, E. S. Mond, J. C. Philip, F. L. Pyman, W. Rintoul, and the Officers (Treasurer as Chairman), with the Assistant Secretary as Secretary.

House Committee: J. L. Baker, Sir Herbert Jackson, Sir William J. Pope, Sir Robert Robertson, Alexander Scott, J. M. Thomson, and the Officers, with the Assistant Secretary as Secretary.

Library Committee: J. J. Fox, T. A. Henry, J. R. Partington (Chairman), S. W. Smith, J. F. Spencer, H. Terrey, and the Officers, together with representatives of contributing Societies, with the Librarian as Secretary.

Publication Committee: H. Bassett, G. M. Bennett, H. V. A. Briscoe, H. M. Dawson, A. C. G. Egerton, J. J. Fox, A. J. Greenaway, W. N. Haworth, T. A. Henry, J. T. Hewitt, C. N. Hinshelwood, C. K. Ingold, J. Kenyon, H. King, W. H. Mills, J. C. Philip, F. L. Pyman, E. K. Rideal, R. Robinson, N. V. Sidgwick (Chairman), J. L. Simonsen, S. Smiles, S. Sugden, and the Officers, with the Editor as Secretary.

Research Fund Committee: A. J. Allmand, J. E. Coates, W. N. Haworth, I. M. Heilbron, G. G. Henderson, C. K. Ingold, A. Lapworth, W. H. Mills, Sir Robert Robertson, N. V. Sidgwick, and the Officers, with the Assistant Secretary as Secretary.

Forms of Recommendation for Fellowship were read for the first time in favour of:

Colin Henry Beale, B.Sc., 22, South Street, Dorchester, Dorset.
Frederick Howard Brain, B.A., B.Sc., 63, Maids Causeway, Cambridge.
Erich Clar, Dr. Ing., Via G. Colombo 81, Milan, Italy.
Joseph Needham Kilby, Wildfell, Morthen, Thurcroft, Rotherham.
Kozo Miki, University College, Gower Street, W.C.1.
Cedric Burton Radcliffe, M.Sc., 46, Carlton Gore Road, Auckland, New Zealand.

The following form of recommendation for Fellowship has been authorised by the Council for presentation to ballot under Bye-Law I (2):

Ratilal Maneklal Gandhi, Bansda, Bombay Presidency, India.

The following papers were read:

"The essential oil of *Backhousia Angustifolia*. Part II. The isolation of naturally occurring β-diketones; angustione and dehydroangustione." By C. S. Gibson, A. R. Penfold, and J. L. Simonsen.

"Attempts to prepare cyanine dyes from quaternary salts of 2-methylacenaphthpyridine and of *ms*-methylacridine." By (Miss) F. M. Hamer.

"The production of fog in the neutralisation of alkali with hydrogen halides. Part II. The significance of the presence of ammonia." By R. W. Aldis and J. C. Philip.

"10-Chloro-5 : 10-dihydrophenarsazine and its derivatives. Part XII. Absorption spectra." By C. S. Gibson, E. S. Hiscocks, J. D. A. Johnson, and J. L. Jones.

THE FARADAY LECTURE.

The Faraday Lecture, entitled "Chemistry and the Quantum Theory," will be delivered by Professor Dr. Niels Bohr, For. Mem. R.S., at the Salters' Hall, St. Swithin's Lane, E.C.4, on Thursday, May 8th, 1930, at 5.30 p.m. (by kind permission of the Master, Wardens, and Court of the Salters' Company).

Admission will be by ticket only. The seating accommodation is limited, and Fellows should apply without delay to the Assistant Secretary, Chemical Society, Burlington House, Piccadilly, W.1. Applications for more than one ticket will be dealt with in the order they are received.

RESEARCH FUND COMMITTEE.

A meeting of the Research Fund Committee will be held in June next. Applications for grants, to be made on forms obtainable from the Assistant Secretary, must be received on or before Monday, June 2nd, 1930. Applications from Fellows will receive prior consideration.

All persons who received grants in June, 1929, or in June of any previous year, whose accounts have not been declared closed by the Council, are reminded that reports must be returned by June 2nd.

Attention is drawn to the fact that the income arising from the Donation of the Worshipful Company of Goldsmiths is to be more or less especially devoted to the encouragement of research in Inorganic and Metallurgical Chemistry, and that the income from the Perkin Memorial Fund is to be applied to investigations relating to problems connected with the Coal Tar and Allied Industries.

List of Papers, or Abstracts thereof, received between March 20th and April 3rd, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting, or which have appeared in the Journal.)

"Some aromatic arsenic compounds containing nuclear substituent sulphur groups." By H. J. BARBER.

"The constitution of santonin. Part II. The synthesis of racemic desmotroposantonin." By G. R. CLEMO, R. D. HAWORTH, and E. WALTON.

"The scission of diaryl ethers and related compounds by means of piperidine. Part IV. Elimination of halogen atoms and scission reactions during substitution processes." By D. L. FOX and E. E. TURNER.

" Ortho- and meta-derivatives of simple alkylphenyl-ketones." By L. A. ELSON, C. S. GIBSON, and J. D. A. JOHNSON.

" The syntheses of glucosides. Part IV. Alizarin glucoside." By A. ROBERTSON.

" Some derivatives of *m*-xylene." By E. G. BOYCE, W. P. RANKINE, and A. ROBERTSON.

" The co-ordination compounds of oximes." By O. L. BRADY and M. M. MUERS.

" The formation of phenoxazines." By O. L. BRADY and C. WALLER.

" The mechanism of the formation of benziminazoles." By M. A. PHILLIPS.

" The polysulphides of the alkali metals. Part I. Sodium. Part I." By T. G. PEARSON and P. L. ROBINSON.

" The preparation of some diphenyl ethers." By R. V. HENLEY.

" Conversion of hydroaromatic into aromatic compounds. Part IV. The influence of the nitro-group in phenyldihydroresorcinol." By L. E. HINKEL and J. F. J. DIPPY.

" A general (exact) equation to the potentiometric titration curve." By B. CAVANAGH.

" Studies of electrolytic polarisation. Part IX. Complex cyanides : zinc, cadmium, and mercury." By S. GLASSTONE.

" The preparation of compounds analogous in structure to sulphinic acids but containing *p*-toluenesulphonimido-groups in place of oxygen atoms. Phenyl and methyl *p*-toluenesulphonimido-sulphine-*p*-toluenesulphonylimines." By S. G. CLARKE, J. KENYON, and H. PHILLIPS.

" Glucosides. Part III. The abnormal replacement of halogen in glucosyl halides : the formation of β-glucosides from β-glucosyl chlorides." By W. J. HICKINBOTTOM.

" The influence of dissolved salts on the mutual miscibility temperature of liquid systems. Part I. The systems—water with (*a*) *n*-butyric acid, (*b*) *iso*butyric acid, (*c*) phenol." By W. H. PATTERSON.

" The solubilities of nitrophenols in aqueous ethyl-alcoholic solutions. Indications of alcohol–water complexes." By J. C. DUFF and E. J. BILLS.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

CERCHEZ, VASILE TH. Recherches sur l'ether aminomalonique et quelques-uns de ses dérivés. Lyon 1929. pp. 173. (*Recd.* 10/3/30.) From the Author.

CHAMOT, ÉMILE MONNIN, and MASON, CLYDE WALTER. Handbook of chemical microscopy. Vol. I. Principles and use of microscopes and accessories. Physical methods for the study of chemical problems. New York 1930. pp. xiv + 474. ill. 22*s*. 6*d*. net. (*Recd*. 17/3/30.)

From the London Publishers : Messrs. Chapman & Hall.

CHAPLET, A. Où en est la chimie industrielle ? Paris 1928. pp. viii + 288. ill. 25 *fr*. (*Recd*. 21/3/30.)

COLLOID SYMPOSIUM ANNUAL. (Formerly Colloid Symposium Monograph.) Papers presented at the 7th Symposium on Colloid Chemistry, Johns Hopkins University, June 1929. New York 1930. pp. viii + 300. ill. 22*s*. 6*d*. net. (*Recd*. 17/3/30.)

From the London Publishers : Messrs. Chapman & Hall.

DUPONT, G. Les essences de térébenthine. Paris 1926. pp. 332. ill. 24 *fr*. (*Recd*. 21/3/30.)

FRIMAUDEAU, S. La soudure électrique a l'arc métallique. Paris [1924]. pp. vi + 135. ill. (*Recd*. 21/3/30.)

GEDROIZ, K. K. Chemische Bodenanalyse. Translated from the Russian by L. FREY. Berlin 1926. pp. xii + 245. *M*. 12. (*Recd*. 21/3/30.)

MEZGER, ROBERT, and PISTOR, FRIEDRICH. Die Reaktionsfähigkeit des Kokses. Ihre Ursachen, alte und neue Wege zu ihrer Bestimmung. Halle (Saale) 1927. pp. viii + 88. ill. (*Recd*. 21/3/30.)

MILLIS, CHARLES THOMAS. Technical education, its development and aims. London 1925. pp. viii + 183. 6*s*. net. (*Recd*. 21/3/30.)

MOLITOR, HEINRICH. Die Fabrikation der Soda. Leipzig 1925. pp. xvi + 231. ill. *M*. 11.60. (*Recd*. 21/3/30.)

MULLER, ERICH. Die elektrometrische Massanalyse. Dresden 1921. pp. viii + 110. ill. (*Recd*. 21/3/30.)

ORGANIC SYNTHESES : an annual publication of satisfactory methods for the preparation of organic chemicals. Vol. X. New York 1930. pp. viii + 119. ill. 8*s*. 6*d*. net. (*Recd*. 17/3/30.)

From the London Publishers : Messrs. Chapman & Hall.

RIDEAL, SAMUEL, and associates. The carbohydrates and alcohol. London 1920. pp. xvi + 219. ill. 12*s*. 6*d*. net. (*Recd*. 21/3/30.)

SMITH, PAUL I. Glue and gelatine. London 1929. pp. x + 162. ill. 8*s*. 6*d*. net. (*Recd*. 21/3/30.)

STEINER, O. Industrie der Fette und Seifen. Dresden 1925. pp. viii + 83. *M*. 4. (*Recd*. 21/3/30.)

WARE, JOHN C. The chemistry of the colloidal state : a textbook for an introductory course. New York 1930. pp. xiv + 313. ill. 18*s*. 6*d*. net. (*Recd*. 17/3/30.)

From the London Publishers : Messrs. Chapman & Hall.

II. *By Purchase.*

AUDEN, HAROLD ALLDEN. Sulphuric acid and its manufacture. London 1930. pp. viii + 231. ill. 16*s*. net. (*Recd.* 20/3/30.)

BURSTIN, HUGO. Untersuchungsmethoden der Erdölindustrie (Erdöl, Benzin, Paraffin, Schmieröl, Asphalt usw.) Berlin 1930 pp. xii + 300. ill. *M*. 22. (*Recd.* 11/4/30.)

DANIELS, FARRINGTON, MATHEWS, J. HOWARD, and WILLIAMS, JOHN WARREN. Experimental physical chemistry. New York 1929. pp. xvi + 475. ill. 17*s*. 6*d*. net. (*Recd.* 20/3/30.)

DIETERICH, KARL. Analyse der Harze, Balsame und Gummiharze. 2nd edition. By ERICH STOCK. Berlin 1930. pp. x + 456. ill. *M*. 44. (*Recd.* 11/4/30.)

EDER, JOSEF MARIA. Ausführliches Handbuch der Photographie. Vol. III. Part 4. Die Sensitometrie, photographische Photometrie und Spektrographie. 3rd edition. Halle (Saale) 1930. pp. xvi + 612. ill. *M*. 44.50. (*Recd.* 26/3/30.)

FRÖLICH, GUSTAV, SPÖTTEL, WALTER, and TÄNZER, ERNST. Wollkunde. Bildung und Eigenschaften der Wolle. Berlin 1929. pp. x + 419. ill. *M*. 54. (*Recd.* 26/3/30.)

PREGL, FRITZ. Die quantitative organische Mikroanalyse. 3rd edition. Berlin 1930. pp. xii + 256. ill. *M*. 20. (*Recd.* 11/4/30.)

RABINOWITSCH, EUGEN, and THILO, ERICH. Periodisches System. Geschichte und Theorie. Stuttgart 1930. pp. xii + 302. ill. *M*. 29. (*Recd.* 26/3/30.)

RICE, JAMES. Introduction to statistical mechanics for students of physics and physical chemistry. London 1930. pp. x + 333. 18*s*. net. (*Recd.* 20/3/30.)

SCHIMMEL, ALFRED. Metallographie der technischen Kupferlegierungen. Berlin 1930. pp. vi + 142. ill. *M*. 20.50. (*Recd.* 11/4/30.)

THUROW, WILLY H. English-German and German-English dictionary of chemistry. Part I. English-German. Berlin 1929. pp. viii + 261. (*Reference.*) 14*s*. net.

WELTZIEN, WILHELM, with the collaboration of KURT GÖTZE. Chemische und physikalische Technologie der Kunstseiden. Leipzig 1930. pp. xx + 521. ill. *M*. 45. (*Recd.* 13/3/30.)

WÜSTENFELD, HERMANN. Lehrbuch der Essigfabrikation. Berlin 1930. pp. xvi + 403. ill. *M*. 26. (*Recd.* 11/4/30.)

ZAPOLEON, L. B. Inedible animal fats in the United States: considered with special reference to sources of animal waste, the rendering industry, municipal reduction, and some effects of meat inspection. California 1929. pp. xvi + 353. 20*s*. net. (*Recd.* 25/2/30.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, May 1st, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	*Died.*
Robert William Atkinson	Mar. 7th, 1872.	Dec. 10th, 1929.
Charles Taylor Cockburn	Dec. 6th, 1906.	Feb. 6th, 1930.
David Corrie	April 17th, 1890.	Mar. 22nd, 1930.

Forms of Recommendation for Fellowship were read for the first time in favour of :

Syed Zahoorul Hassan, Banwari Jola, Patigali, Patna City.
David James Gibbs Ives, B.Sc., A.R.C.S., 80, Wildwood Road, N.W. 11.
Frederic Samuel Kernick, Messrs. Kernick & Son, Ltd., Cardiff.
Archibald Alexander Neil, M.A., D. ès. Sc., c/o Mrs. Francis, 45, Barrington Crescent, Yarm Lane, Stockton-on-Tees.
Ernest Adam Wagstaff, B.Sc., 233, Woodborough Road, Nottingham.

Dr. H. Burton and Dr. D. C. Jones were elected Scrutators and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows.

Edmund David Patrick Barkworth, B.A.
Paul Borg.
Norah Janet Broadway, B.Sc.
Reginald Henry Coysh, M.Sc.
Negoita Dănăila.
John Henry Daniels.
Lionel Stuart Davis.
Dorothy Mary Diamond.
William Francis, F.I.C.
Louis Robert Hickson, B.Sc., A.I.C.
Ivor Lloyd.
George George Longinescu.
Samuel Marion McElvain, M.A., Ph.D.
Arthur William Middleton, B.Sc.
Wilfred Morley Morgans, B.Sc.
Margaret Mary Murray, M.Sc.
Homi Ruttonji Nanji, B.Sc.
William Dales Oldham.
Wilfred Beaumont Orr, D.Sc., Ph.D.
Donald Price, A.B., M.A., Ph.D.
Pundi Ranga Ramanujam, B.A.
William Edward Raybould, B.Sc., A.I.C.
Charles Benjamin Walter Richardson, B.Sc.
Robert Chester Roberts, M.A., Ph.D.
Vinayak Yeshwant Shewade, B.Sc.
Foster Dee Snell, B.S., A.M., Ph.D.
Walter Frederick Thorne, B.Sc.
Frederic Eric Tomkinson, B.Sc., M.A.
Allan Coley Waine, B.Sc.
Eric Walton, M.Sc., Ph.D.
Ronald Southern Walton, B.Sc.
Albert Ernest Roberts Westman, M.A., Ph.D.
Alfred Harold Whitaker.
Robert David Williams, M.Sc.
James Williamson.
Eric Ernest Thomas Young.

The following papers were read :

" Orientation effects in the diphenyl series. Part VIII. The nitration of 4 : 4′-difluorodiphenyl." By R. J. W. Le Fèvre and E. E. Turner.

" The scission of diaryl ethers and related compounds by means of piperidine. Part IV. Elimination of halogen atoms and scission reactions during substitution processes." By (Miss) D. L. Fox and E. E. Turner.

" The critical solution temperature of the system methyl alcohol–*cyclo*hexane as a means of detecting and estimating water in methyl alcohol." By D. C. Jones and S. Amstell.

" The mechanism of, and constitutional factors controlling, the hydrolysis of carboxylic esters. Part III. The calculation of molecular dimensions from hydrolytic stability maxima." By C. K. Ingold.

Extra meeting held on Thursday, May 8th, 1930, at 5.30 p.m., at the Salters' Hall, St. Swithin's Lane, E.C. 4, Professor J. F. Thorpe, C.B.E., D.Sc., F.R.S., President, in the Chair.

The President called upon Professor Dr. Niels Bohr, of Copenhagen, to deliver the fourteenth Faraday Lecture, entitled " Chemistry and the Quantum Theory." At the conclusion of the lecture, the President presented the Faraday Medal to Professor Bohr, and then asked Sir Ernest Rutherford, P.R.S., to propose a vote of thanks to the Lecturer. This was seconded by Professor F. G. Donnan, and carried with acclamation, Professor Bohr making brief acknowledgment.

The President expressed the thanks of the meeting to the Master, Wardens, and Court of the Salters' Company for the privilege of holding the lecture in the Salters' Hall.

Ordinary Scientific Meeting, Thursday, May 15th, 1930, at 8 p.m., Professor J. F. Thorpe, C.B.E., D.Sc., F.R.S., President, in the Chair.

The President referred to the loss sustained by the Society, through death, of the following Fellows :—

	Elected.	*Died.*
Edward Greenhill Amphlett	March 5th, 1885.	May 4th, 1930.
Ayerst Henham Hooker	Feb. 7th, 1878.	May 6th, 1930.

The following were formally admitted Fellows of the Chemical Society: F.M. E. Shepherd, G. R. Shutt, R. H. Coysh, F. G. Lamont.

Forms of Recommendation for Fellowship were read for the first time in favour of:—

John Goldie Breckenridge, B.Sc., Emmanuel College, Cambridge.
Robert Forsyth, M.Sc.Tech., Ph.D., 3, Epperstone Road, West Bridgford, Nottingham.
Harold Livesey, B.A., Campbell College, Belfast.
Shrinivas Gangadhar Pant, Ogalevadi, Aundh State, District Satara, Bombay Presidency.

The following forms of recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2):—

Vasile Théodore Cerchez, D. ès. Sc., L'Ecole Polytechnique, Bucarest.
Albert Edison Miller, B.S., 229, Sinclair Place, Westfield, N.J., U.S.A.
Philip Triest Sharples, A.B., Haverford, Pennsylvania, U.S.A.
Peter Carter Speers, B.Sc., Napier Road, Lahore, India.

The following papers were read:

"Adsorption by silicic acid gel in the system *n*-butyl alcohol–benzene." By D. C. Jones and L. Outridge.

"On the dielectric strength of some explosive mixtures containing carbonic oxide." By B. W. Bradford and G. I. Finch.

"The system *cyclo*hexanol and water." By N. V. Sidgwick and L. E. Sutton.

"Studies in complex salts. Part III. The effect of alkyl substitution on the stability of the dimalonatocupriate ion." By H. L. Riley.

List of Papers, or Abstracts thereof, received between April 3rd and May 15th, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting or which have appeared in the Journal.)

"The solubility of neodymium sulphate in water and in sulphuric acid solutions at various temperatures. A new hydrate." By J. A. N. Friend.

"Investigations of the olefinic acids. Part II. Preliminary observations on the occurrence of spontaneous tautomeric change at temperatures near the boiling point." By R. P. Linstead.

" On phenylacetaldehyde." By J. R. POUND.
" A note on some properties of benzaldehyde." By J. R. POUND.
" Dehydro-2-naphthol sulphone." By L. A. WARREN and S. SMILES.
" The lower trialkyl orthophosphates. Part I." By D. P. EVANS, W. C. DAVIES, and W. J. JONES.
" The reaction between aminophenylarsinic acids and carbon disulphide." By J. G. EVERETT.
" The synthesis of *meso*-alkyl and *meso*-aryl anthracene derivatives. Part VII." By E. DE B. BARNETT and N. F. GOODWAY.
" The space-configuration of the trithioacetaldehydes." By F. D. CHATTAWAY and E. G. KELLETT.
" The physical identity of enantiomers." By A. N. CAMPBELL and F. C. GARROW.
" Determination of the reactivity of a coke to steam and carbon dioxide." By A. KEY and J. W. COBB.
" Chrysogene." By A. RUSSELL.
" Attempts to find new antimalarials. Part V. Some piperidino- and piperazino-derivatives of quinoline." By W. O. KERMACK and J. F. SMITH.
" Studies in the reactivity of aromatic hydroxyl groups. Part I." By H. L. BASSETT.
" The sulphonation of *m*-chlorophenol and some new halogenophenols." By H. H. HODGSON and A. KERSHAW.
" Colloidal platinum. Part VII. The effect of electrolytes upon the cataphoretic velocity of platinum particles and its bearing on stability." By S. W. PENNYCUICK.
" The dissociation constants of quinine, cinchonine, and cinchonidine." By E. B. R. PRIDEAUX and F. T. WINFIELD.
" A simple electrically controlled thermostat." By J. A. CRANSTON.
" The alkaloids of ergot. Part I." By S. SMITH and G. M. TIMMIS.
" The influence of a soluble fluoride on the corrosion of iron." By A. W. CHAPMAN.
" Electrical conductivity of solutions in phenol." By R. M. DOLBY and P. W. ROBERTSON.
" The properties of aminophenols. Part I. The interaction of *o*-benzylideneaminophenol and acid chlorides." By F. BELL.
" The nitration of substituted benzaldehydes and the stability of the aldehyde group." By H. H. HODGSON and E. W. SMITH.
" Pyrolysis of diazoamino-*p*-toluene." By G. T. MORGAN and L. P. WALLS.
" Heterocyclic systems containing selenium. Part III. *cyclo*-Selenopropane." By G. T. MORGAN and F. H. BURSTALL.
" The interaction of butyl chloral hydrate and phenylhydrazine :

the formation of 4-hydroxy-1-phenyl-5-methylpyrazole." By F. D. CHATTAWAY and H. IRVING.

" The vapour pressure of nickel carbonyl." By J. S. ANDERSON.

" The mechanism of cyanoacetamide and cyanoacetic ester condensations. A reply." By J. C. BARDHAN.

" Organic antimonial compounds. Part II." By W. J. C. DYKE and W. J. JONES.

" The application of a new type of triode valve to the determination of hydrogen-ion concentration with glass electrodes." By G. B. HARRISON.

" The constitution of some organic derivatives of thallium." By N. V. SIDGWICK and L. E. SUTTON.

" Complex formation amongst the nitrates. Part II. The ternary system phenol–silver nitrate–water." By C. R. BAILEY.

" The period of induction of the reaction between ammonium sulphide and formaldehyde solutions." By R. W. J. LE FÈVRE and (MISS) M. MACLEOD.

FORMS OF RECOMMENDATION FOR FELLOWSHIP. THE BALLOT WILL BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, JUNE 19th, 1930.

BEALE, COLIN HENRY, 22, South Street, Dorchester, Dorset. British. Demonstrator in Chemistry, University College, Southampton. B.Sc. (Lond.), Hons. Chem. Research Student. (*Signed by*) D. R. Boyd, A. I. Vogel, H. H. Hatt.

BRAIN, FREDERICK HOWARD, 63, Maids Causeway, Cambridge. British. Research Student. B.A. Cambridge; B.Sc. London. Class I in Parts I and II, Natural Sciences Tripos. Engaged in research in organic chemistry in University Chemical Laboratory, Cambridge. (*Signed by*) W. J. Pope, W. H. Mills, P. Maitland.

BRECKENRIDGE, JOHN GOLDIE, Emmanuel College, Cambridge. British. Research Student. B.Sc., University of Toronto, Canada. Third year research student in organic chemistry in University Chemical Laboratory, Cambridge. (*Signed by*) Peter Maitland, F. G. Mann, R. E. D. Clark.

CLAR, ERICH, Via G. Colombo 81, Milan, Italy. Austrian Czecho-slovakian citizen. Chief Chemist of Institute of Organic Chemistry, " Istituto di Perfezionamento in Chimica Industriale Giuliana Ronzoni." Dr.-Ing., Dipl.-Ing. (Dresden). Formerly assistant to Professor R. Scholl at the Institut für Organischen Chemie der Technische Hochschule, Dresden, Germany. Publications: *Berichte*, 1929, **62**, 350, 940, 950, 1574, 3021; 1930, **63**, 112, 512. (*Signed by*) G. T. Morgan, J. W. Cook, E. de Barry Barnett.

FORSYTH, ROBERT, 3, Epperstone Road, West Bridgford, Nottingham.

British. Research Chemist. M.Sc. (Tech.), Manchester; Ph.D. (Vict.), Manchester. University Demonstrator in Applied Chemistry, College of Technology, Manchester, 1923–24. Research Assistant to Professor of Applied Chemistry, University of Manchester, 1925–27. Research Chemist, Messrs. Boots' Pure Drug Co., Ltd., 1927 to present time. *J.C.S.*, 1924, **125**, 919; 1925, **127**, 1659; 1926, 800, 2502, 2912; 1930, 397. (*Signed by*) Frank Lee Pyman, Reginald Child, Reginald C. Fawcett.

HASSAN, SYED ZAHOORUL, Banwari Jola, Patigali, Patna City, B. & O., India. Indian. At present a volunteer at I.G. Farbenindustrie Aktiengesellschaft, Germany. (Government of India's Scholar.) Student at the Government Dyeing and Printing Institute, Cawnpore, India. University of Patna, University of Calcutta. Student at the College of Technology, Manchester, as Government of India's Scholar. Volunteer at British Alizarin Co., Ltd., Manchester, and I.G. Farbenindustrie A.-G., Germany. (*Signed by*) Fredk. A. Mason, John K. Wood, Arthur M. Morley.

IVES, DAVID JAMES GIBBS, 80, Wildwood Road, Golders Green, N.W. 11. British. Research Student. B.Sc. (Lond.); A.R.C.S. (*Signed by*) Jocelyn Thorpe, G. A. R. Kon, H. L. Riley.

KERNICK, FREDERIC SAMUEL, Trencrom Heoldon, Whitchurch (Glam.). British. Manufacturing Chemist. Twelve years' General Analytical and Manufacturing experience, England and France. Ten years Director, Messrs. Kernick & Son, Ltd., Manufacturing Chemists and Chemical Apparatus Manufacturers, Cardiff, and as Designer of that firm's special apparatus used in Universities at home and abroad; it is necessary to keep in touch with latest chemical thought. (*Signed by*) J. H. Duncan, D. Owen Davies, Ernest A. Rudge.

KILBY, JOSEPH NEEDHAM, "Wildfell," Morthen Thurcroft, nr. Rotherham. British. Chief Metallurgist and Works Manager. Papers before: Iron and Steel Inst., 1917, 1918 (2 papers); Sheffield Engineers and Metallurgists (Univ.), 1917, 1929 (2 papers); Sheffield Trades Technical Societies (Univ.), 1928, 1929, 1930 (12 papers); Sheffield Metallurgical Assoc. (Works), 1921, 1922, 1928, 1929 (5 papers); A.M.I.Mech.E. All above papers on steel manufacture, defects in, chemistry of, except four, which were on gas producer practice. (*Signed by*) W. H. Hatfield, E. H. Saniter, Cecil H. Desch.

LIVESEY, HAROLD, Campbell College, Belfast. British. Senior Chemistry Master. B.A., Cantab. Three years' experience teaching Chemistry of University Scholarship standard. (*Signed by*) W. G. Palmer, A. J. Berry, Harold A. Scarborough.

MIKI, KOZO, University College, Chemical Department, Gower Street, W.C.1. Japanese. Chemical Engineer. Doctor, Tokio Imperial University, Japan. (*Signed by*) Robert Robinson, K. N. Menon, S. Sugasawa.

NEIL, ARCHIBALD ALEXANDER, c/o Mrs. Francis, 45, Barrington Crescent, Yarm Lane, Stockton-on-Tees, Co. Durham. British. Librarian (Synthetic Ammonia and Nitrates, Ltd., Billingham, Stockton-on-Tees). M.A., Oxford (College, Merton), 1898; Diploma in Technical Chemistry, Polytechnicum, Zürich, 1901; D.-ès-Sciences, Geneva, 1906. Science Master (two and a half years). One and a half years Chemist in Bleaching and Dye Works. Three years Gas Works Chemist. Seven years Chemical Journalism (Brunner Mond & Co., Ltd.). Since July 1920 Librarian at Synthetic Ammonia and Nitrates, Ltd. Thesis (Geneva, 1906): "Recherche dans la série des azoxines." "On Dinaphthalene Dioxide" (*J.C.S.*, 1906, A., i, 356, from *Ber.*, 1906, **39**, 1059–60). Synthesis in "Oxazine Group" (with F. Kehr-

mann), *J.C.S.*, 1915, A., i, 303 (*Ber.*, 1914, **47**, 3102-9). (*Signed by*) M. P. Applebey, G. I. Higson, W. Idris Jones.

PANT, SHRINIVAS GANGADHAR, Ogalevadi, Aundh State, Dist. Satara, Bombay Presidency, India. Indian (Hindoo Brahman). Managing Proprietor of the Aundh Soap Works, Ogalevadi. Licentiate of Chemical Technology (L.T.C.) from Victoria Jubilee Technical Institute, Bombay, with oils and soaps as special subjects. Theoretical and practical experience in the Mysore Government Soap Factory, Bangalore, and Madras Government Kerala Soap Institute, Calicut. I wish to take advantage of the modern scientific progress by reading the Chemical Society's journal and other publications. (*Signed by*) A. K. Menon, S. G. Sastry, D. K. Rao.

RADCLIFFE, CEDRIC BURTON, 46, Carlton Gore Road, Auckland, New Zealand. British. Research Chemist. M.Sc. (New Zealand). Student of Chemistry, engaged in research work for the last three years. Publications: "The Essential Oil of *Phebalium nudum*," by C. B. Radcliffe and W. F. Short, *J.S.C.I.*, 1928, **47**, 324T. "The Essential Oil of *Melicope ternata* (Wharangi)," by C. B. Radcliffe, *Trans. N.Z. Institute*, 1929, **60**, 251. (*Signed by*) F. P. Worley, W. Frank Short, A. H. Bowell.

WAGSTAFF, ERNEST ADAM, 233, Woodborough Road, Nottingham. British. Student. B.Sc. (London, External). Research Student, University College, Nottingham. (*Signed by*) F. S. Kipping, E. B. R. Prideaux, H. H. Barber.

The following Forms of Recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2):

CERCHEZ, VASILE THÉODORE, Bucarest (Roumania), Laboratoire de Chimie Organique de l'École Polytechnique, Rue Polizu. Roumanian. Assistant au Lab. de Chimie Organique de l'Ecole Poly. Docteur-ès-Sciences Physique (Diplôme d'Etat Français), Université de Lyon. Diplôme de l'Ecole Nationale Sup. du Petrole de Strasbourg. Travaux scientifiques publiés: "Recherches sur la chloruration dans la série du butane," *Bull. Soc. Chim. de France*, 1925, T. **37**, 1131. "Contribution à la connaissance du raffinage chimique des huiles minérales," *Bull. Soc. Chim.*, 1927, T. **41**, 771. "Sur l'emploi des alcoolates de Mg dans la prep. des ethers-oxydes," *Bull. Soc. Chim.*, 1928, T. **43**, 762. "Recherches sur l'éther aminomalonique," Thèses, Lyon, 1929. (*Signed by*) C. S. Gibson.

GANDHI, RATILAL MANEKLAL, Bansda (Bombay Presidency), India. Hindu. Assistant Director, Commerce and Industries, Bansda State, Bansda. Practical Manufacturing Chemist, expert in making soap, oil paints, distemper, sanitary water paints, varnishes, and several pharmaceutical preparations, etc. (*Signed by*) Kantilal M. Sheth.

MILLER, ALBERT EDISON, 229, Sinclair Place, Westfield, New Jersey. U.S.A. American. Petroleum Chemist. B.S., Chemistry, The Pennsylvania State College, U.S.A. Investigator of processes and inventions for Sinclair Refining Co., of 45, Nassau Street, New York City, for twelve years. Inventor of U.S. Patents 1,311,987, 1,714,097, and 1,646,760. Author of numerous technical articles in American and German periodicals. (*Signed by*) J. G. Detwiler, K. G. Mackenzie.

SHARPLES, PHILIP TRIEST, Haverford, Pennsylvania, U.S.A. (Business address: 23rd and Westmoreland Streets, Philadelphia, Pennsylvania, U.S.A.). American. Centrifugal Engineer. President, Sharples Specialty

Co., Sharples Solvents Corporation. A.B., Swarthmore College, Swarthmore, Pennsylvania. Developed process for commercial production of amyl alcohols from pentane. Developed super-centrifuge. (*Signed by*) Gellert Alleman, Walter A. Patrick.

SPEERS, PETER CARTER, Napier Road, Lahore. American. Professor of Technical Chemistry, University of the Punjab, and Head of the Department of Chemistry, Forman Christian College, Lahore. B.Sc. (Princeton). (*Signed by*) N. A. Yajnik, S. S. Bhatnagar.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

CHEMICAL ENGINEERING AND CHEMICAL CATALOGUE. 6th edition. Edited by DUDLEY MAURICE NEWITT. London 1930. pp. 394 + lvi. ill. (*Reference.*) 15*s.* net.

From the Publishers : Messrs. Leonard Hill.

LING, EDGAR ROBERTS. A text-book of dairy chemistry, theoretical and practical, for students of agriculture and dairying. London 1930. pp. viii + 213. ill. 6*s.* net. (*Recd.* 8/5/30.)

From the Publishers : Messrs. Chapman & Hall.

NASINI, RAFFAELLO. I soffioni e i lagoni della Toscana e la industria boracifera. Storia, studi, ricerche chimiche e chimico-fisiche eseguite principalmente nell'ultimo venticinquennio. Roma 1930. pp. xii + 658. ill. (*Recd.* 15/5/30.)

From Prince Ginori Conti and the Author.

ODDO, GIUSEPPE. Trattato di chimica organica. Palermo 1930. pp. xvi + 949. ill. *L.* 90. (*Recd.* 28/4/30.)

From the Publisher : Signor Remo Sandron.

RIDEAL, ERIC KEIGHTLEY. An introduction to surface chemistry. [2nd edition.] Cambridge 1930. pp. xii + 459. 21*s.* net. (*Recd.* 3/5/30.) From the Syndics of the Cambridge University Press.

TRILLAT, JEAN JACQUES. Les applications des rayons X. Physique-chimie-métallurgie. (Recueil des Conférences-Rapports de Documentation sur la Physique.) Paris 1930. pp. iv + 298. ill. 85 *fr.* (*Recd.* 13/5/30.)

From the Publishers : Les Presses Universitaires de France.

II. *By Purchase.*

BLUM, WILLIAM, and HOGABOOM, GEORGE B. Principles of electroplating and electroforming (electrotyping). 2nd edition. New York 1930. pp. xvi + 424. ill. 22*s.* net. (*Recd.* 15/5/30.)

CORSE, W. M. Bearing metals and bearings. (American Chemical Society Monograph Series.) New York 1930. pp. 383. ill. 29*s.* 6*d.* net. (*Recd.* 15/5/30.)

FREEMAN, BENJAMIN, and HOPPE, FREDERICK G. Electroplating with chromium, copper, and nickel. New York 1930. pp. x + 212. ill. 21*s*. net. (*Recd.* 15/5/30.)

FRIEND, JOHN NEWTON. A text-book of inorganic chemistry. Vol. XI. Organometallic compounds. Part ii. Derivatives of arsenic. By ARCHIBALD EDWIN GODDARD. London 1930. pp. xxviii + 605. (Two copies.) 42*s*. net.

MACLEOD, JOHN JAMES RICKARD, [and others]. Physiology and biochemistry in modern medicine. 6th edition. [St. Louis] 1930. pp. xxxii + 1074. ill. 42*s*. net. (*Recd.* 15/5/30.)

MICHAELIS, LEONOR. Oxidation-reduction potentials. Translated from the German manuscript by LOUIS B. FLEXNER. Philadelphia 1930. pp. xiv + 199. ill. 12*s*. 6*d*. net. (*Recd.* 8/5/30.)

SCHAEFER, CLEMENS, and MATOSSI, FRANK. Der Ramaneffekt. (Fortschritte der Chemie, Physik und physikalischen Chemie. Vol. XX.) Berlin 1930. pp. iv + 52. ill. (Reference.)

STUMPER, R. Die physikalische Chemie der Kesselsteinbildung und ihrer Verhütung. (Sammlung. New Series. Vol. I.) Stuttgart 1930. pp. 51. ill. (*Reference.*)

THEWS, EDMUND RICHARD. Metallurgy of white metal scrap and residues. New York 1930. pp. xiv + 383. ill. 24*s*. net. (*Recd.* 28/4/30.)

UNITED STATES STEEL CORPORATION. Methods . . . for the sampling and analysis of coal, coke and by-products. 3rd edition. Pittsburgh [1929]. pp. xiv + 334. ill. 13*s*. 6*d*. net. (*Recd.* 8/5/30.)

WILLIAMS, JOHN WARREN. Molekulare Dipolmomente und ihre Bedeutung für die chemische Forschung. (Fortschritte der Chemie, Physik und physikalischen Chemie. Vol. XX.) Berlin 1930. pp. iv + 66. ill. (*Reference.*)

III. *Pamphlets.*

AERONAUTICAL RESEARCH COMMITTEE. Reports and Memoranda. No. 1244. The influence of oxygen on corrosion fatigue. By A. M. BINNIE. London 1929. pp. 3. ill.

—— —— No. 1253. Report on some properties of alloys of aluminium with thorium and silicon. By J. D. GROGAN and T. H. SCHOFIELD. London 1929. pp. 12. ill.

—— —— No. 1266. Experiments on flame extinction in gaseous mixtures. By W. HELMORE. London 1930. pp. 17. ill.

ALPHEN, JAN VAN. Inwerking van keteenen op hydrazinederivaten. Leiden 1924. pp. xii + 96.

[AUSTRALIA, COMMONWEALTH OF.] *Department of Defence.*

Munitions Supply Board. Knocking in internal combustion engines and the use of anti-knock fuels. By ALFRED ERNEST DAWKINS. Melbourne 1929. pp. 35. ill.

BAUDET, HENRI PHILIPPE. Vervangbaarheid van het halogeenatoom in 1-chloor- en 1-broom-2-cyaan-4-nitrobenzol. Leiden 1922. pp. 75.

BRITISH CAST IRON RESEARCH ASSOCIATION. Research Report No. 72. Recommended methods for sampling and analysis of foundry materials. Birmingham 1929. pp. 16.

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—— Special Report Series, No. 69. Reports on biological standards. I. On the physiological standardization of extracts of the posterior lobe of the pituitary body. By JOSHUA HAROLD BURN and HENRY HALLETT DALE. London 1922. pp. 52. ill.

—— Special Report Series, No. 72. The acid-base equilibrium of the blood. By the Hæmoglobin Committee. London 1923. pp. 70. ill.

—— Special Report Series, No. 119. A study of some organic arsenical compounds with a view to their use in certain streptococcal infections. By LEONARD COLEBROOK. London 1928. pp. 41. ill.

—— Special Report Series, No. 141. The tannic acid treatment of burns. London 1929. By WILLIAM COMBE WILSON. pp. 34. ill.

MENALDA, FREDERIK ARNOLD. Quantitatief onderzoek der reactie van Schotten-Baumann. Leiden 1929. pp. xii + 79.

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MINISTRY OF HEALTH. The purification of the water of swimming baths. London [1929]. pp. 52.

MINISTRY OF TRANSPORT. Treatment of sulphur fumes in connection with the working of the proposed electric power station of the London Power Company at Battersea. Interim report of the advisers to the London Power Company together with the interim report of the Committee presided over by the Government Chemist. London 1929. pp. 10. ill.

MITTER, PRAFULLA CHANDRA. Some aspects of biochemical synthesis. Presidential address (chemistry section) 17th Indian Science Congress. Allahabad 1930. pp. 19.

MULLIN, CHARLES EARL. Influence du p_H dans les phénomènes de teinture. Paris 1929. pp. 84.

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—— The water-content of the heart-muscle in beri-beri columbarum. (From the *Indian J. Med. Research*, 1930, **17**.)

—— Salt licks. (From the *Trans. F.E.A.T.M. 7th Congress*, 1927, **3**.) Calcutta 1929.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, June 5th, 1930, at 8 p.m., Professor H. BRERETON BAKER, C.B.E., D.Sc., F.R.S., in the Chair.

The CHAIRMAN referred to the loss sustained by the Society, through death, of the following Fellows :—

	Elected.	Died.
Charles John Baker	Dec. 6th, 1883.	May 15th.
Robert Barton	Jan. 18th, 1872.	May 26th.

The CHAIRMAN announced that a communication had been received from the Committee of the Van 't Hoff Fund for the endowment of research in pure and applied chemistry. The amount from this fund available for distribution during 1931 is about 1200 Dutch guilders.

A Committee consisting of Professor A. F. Holleman (President), Professor F. M. Jaeger, Professor A. Smits and Professor J. P. Wibaut (Secretary) has been appointed to award grants. Applications should be sent before November 1st, 1930, by registered post to : " Het Bestuur der Koninklijke Akademie van Wetenschappen, bestemd voor de Commissie van het van 't Hoff-funds," Trippenhuis, Klovenierburgwal, Amsterdam. Every applicant is requested to submit a detailed account of the manner in which he proposes to expend the grant and to state the reasons for which he makes his application. Papers embodying the results of the research may be published in any journal, but acknowledgment must be made of the source of the grant. Copies of papers containing the results of the research must be forwarded to the Committee.

Forms of Recommendation for Fellowship were read for the first time in favour of :—

Alfred William Baldwin, Ph.D., 100, Cecile Park, Crouch End, N. 8.
William Andrew Beattie, 11, Fraser Grove, Wardie, Edinburgh.
Thomas Lane Harris, B.Sc., 5, Hawthorne Road, King's Norton, Birmingham.
Douglas William Hill, Ph.D., 33, Dunlop Avenue, Lenton, Nottingham.
Thomas John Vernon Parry, 349, Buxton Road, Great Moor, Stockport.
Christine Mary Pilkington, B.A., B.Sc., Somerville College, Oxford.

The following papers were read :—

" The influence of a soluble fluoride on the corrosion of iron." By A. W. CHAPMAN.

" The application of a new type of triode valve to the determination of hydrogen-ion concentration with glass electrodes." By G. B. HARRISON.

" Properties of conjugated compounds. Part X. Variability in the mode of ester-addition to butadiene esters and ketones." By E. H. FARMER and T. N. MEHTA.

Ordinary Scientific Meeting, Thursday, June 19th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT made the following announcements :

1. In connection with the formation of a Central Building Trust for Scientific and Technical Societies and Institutions, the Council had that afternoon authorised him to sign the Memorandum and Articles of Association on behalf of the Society, which, it was hoped, will become one of the Constituent Organisations of the Trust.

2. The attention of Fellows is drawn to a general discussion on Colloid Science Applied to Biology which has been arranged by the Colloid Committee of the Faraday Society. The meeting will be held in the Laboratory of Physical Chemistry, Free School Lane, Cambridge, from September 29th to October 1st, 1930.

3. The first meeting of the new Session, 1930–31, will be held on Thursday, October 16th, 1930, when a memorial plaque of the late Professor W. H. Perkin will be unveiled, and that Professor W. N. Haworth will deliver an oration on his life and work. This will be the only business of the meeting.

Forms of Recommendation for Fellowship were read for the first time in favour of :

Monmohan Chandra, B.Sc., Government High School, Ma-ubin, Burma.
Rudolph Maximilian Goepp, Junior, B.S., Queen's College, Oxford.
Frederick William Hampshire, Overstrand Lodge, Overstrand, Norfolk.

The following form of recommendation for Fellowship has been authorised by the Council for presentation to ballot under Bye-Law I (2) :

Joseph Spencer Fawcett, 186, Oxford Terrace, Christchurch, New Zealand.

The following were formally admitted Fellows of the Chemical Society : E. D. P. Barkworth and N. J. Broadway.

Messrs. F. M. Brewer and G. H. Locket were elected Scrutators and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows :

Colin Henry Beale, B.Sc.
Frederick Howard Brain, B.A., B.Sc.
John Goldie Breckenridge, B.Sc.
Vasile Théodore Cerchez, D.-ès-Sc.
Erich Clar, Dr.-Ing., Dipl.-Ing.
Robert Forsyth, M.Sc., Ph.D.
Ratilal Maneklal Gandhi.
Syed Zahoorul Hassan.
David James Gibbs Ives, B.Sc., A.R.C.S.
Frederic Samuel Kernick.
Joseph Needham Kilby, A.M.I.Mech.E.
Harold Livesey, B.A.
Kozo Miki.
Albert Edison Miller, B.S.
Archibald Alexander Neil, D.-ès.-Sc.
Shrinivas Gangadhar Pant.
Cedric Burton Radcliffe, M.Sc.
Philip Triest Sharples, A.B.
Peter Carter Speers, B.Sc.
Ernest Adam Wagstaff, B.Sc.

The following papers were read :

" The constitution of some organic derivatives of thallium." By N. V. SIDGWICK and L. E. SUTTON.

" Structure of *iso*nitriles and compounds of bivalent carbon." By D. L. HAMMICK, R. G. A. NEW, N. V. SIDGWICK, and L. E. SUTTON.

" The constitution of complex metallic salts." By F. G. MANN.

" The optical resolution of 2 : 4-dinitro-2′-methyldiphenyl-6-carboxylic acid." By (Miss) M. S. LESSLIE and E. E. TURNER.

" The scission of diaryl ethers and related compounds by means of piperidine. Part V. The nitration of methyl-, dimethyl-, and polyhalogeno-derivatives of diphenyl ether." By (Miss) D. L. FOX and E. E. TURNER.

The Council has made the following Grants from the Research Fund :

	£	*s.*	*d.*
Isomeric change of aromatic compounds (*contd.*). A. W. Chapman. (Sheffield Univ.)	10	0	0
Constitution of santonin, and related problems. G. R. Clemo. (Armstrong Coll.)	10	0	0
The chemistry of aconitic acid. R. D. Desai. (Imperial Coll.)...	10	0	0
Synthetical studies of " Jaborandi " alkaloids. A. N. Dey. (Imperial Coll.)	12	0	0
Studies in glucosides. F. S. H. Head. (E. Lond. Coll.)... ...	10	0	0
Synthesis of compounds allied to the cinchona alkaloids. Miss R. V. Henley. (Bedford Coll.)	10	0	0
Nuclear alkylation of aromatic bases. D. H. Hey. (Manchester Univ.)	8	0	0
Syntheses of glucosides and hydroxycarbinols. E. T. Jones. (E. Lond. Coll.)	10	0	0

	£	s.	d.
Effect of *cis-* and *trans*-hexahydrohydrindene nucleus on the carbon tetrahedral angle. A. Kandiah. (Imperial Coll.) ...	10	0	0
Hydroxy-carbonyl compounds. F. E. King. (E. Lond. Coll.)	12	0	0
Three-carbon tautomerism. E. Leton. (Imperial Coll.) ...	10	0	0
Addition of esters to substituted butadiene esters and ketones. T. N. Mehta. (Imperial Coll.)	10	0	0
Velocity of reaction and reactivity of the alkyl iodides and guaiacol. J. A. Mitchell. (Chelsea Poly.)	5	0	0
The glutaconic problem. H. R. Nanji. (Imperial Coll.) ...	10	0	0
Substituted diaryl ethers. J. Reilly. (Univ. Coll., Cork) ...	10	0	0
Certain lichenin derivatives related to cellulose compounds. J. Reilly. (Univ. Coll., Cork)	7	0	0
Diacetamide and triacetamide as polysaccharide solvents. J. Reilly. (Univ. Coll., Cork)	6	0	0
Study of certain mannan derivatives. J. Reilly. (Univ. Coll., Cork)	5	0	0
Tautomeric changes in unsaturated hydrocarbons. Miss R. Schalit. (Imperial Coll.)	10	0	0
Chemistry and stereoisomerism of diaryl ethers. Miss F. R. Shaw. (Bedford Coll.)	10	0	0
A comparative study of the "wetting" of glasses by metals. F. H. Trim. (Sir John Cass Tech. Inst.)	15	0	0
Syntheses of cyclic compounds (*contd.*). A. I. Vogel. (Univ. Coll., Southampton)	15	0	0
Nitration of stilbazoles and β-phenyl ethyl-pyridines. E. A. Wagstaff. (Univ. Coll., Nottingham)	5	0	0
Studies of acids and bases in non-aqueous solvents. W. F. K. Wynne-Jones. (Reading Univ.)	15	0	0
	£235	0	0

THE LIBRARY.

The Library will be closed for Stocktaking from Monday, August 4th, until Saturday, August 16th (inclusive). During the following four weeks (August 18th to September 13th), the Library will close daily at 5 p.m.

List of Papers, or Abstracts thereof, received between May 15th and June 19th, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting, or which have appeared in the Journal.)

"The action of aqueous hydrofluoric acid on silica." By W. G. PALMER.

"Application of thallium compounds in organic chemistry. Part V. Thallous ethoxide." By R. C. MENZIES.

"The constitution of phenolphthalein. Part II. The fading of phenolphthalein in alkaline solution." By H. LUND.

"The asymmetric photochemical decomposition of humulene nitrosite by circularly polarised light." By S. MITCHELL.

"Investigations on the reactivity of halogens in various types of naphthalene derivatives. Part II." By J. B. SHOESMITH and A. MACKIE.

"The solubilities of silver chloride, silver bromide, and silver iodide and the normal potentials of chlorine, bromine, and iodine in methyl alcohol and ethyl alcohol." By F. K. V. KOCH.

"The structure of the tungstic acids. Part I. The ageing of tungstic acids." By A. M. MORLEY.

"The structure of the tungstic acids. Part II. The *X*-ray examination of tungstic acids." By A. M. MORLEY and A. J. BRADLEY.

"The reaction of bromine with aliphatic acids. Part IV. Succinic acid." By E. D. HUGHES and H. B. WATSON.

"The action of freshly precipitated mercuric oxide on a suspension of 3 : 5-dinitrotoluene in aqueous sodium hydroxide." By H. H. HODGSON and E. W. SMITH.

"The influence of the 2 : 6-dihalogeno-substituents on the reaction between fuming nitric acid and the 4-fluoro-2 : 6-dihalogenophenols and -anisoles. Note on the theory of methylation." By H. H. HODGSON and J. NIXON.

"The solubility of the octahydrates of the rare-earth sulphates." By K. S. JACKSON and G. RIENÄCKER.

"Studies in the naphthalene series. Part I. The methylation of α-naphthylamine." By B. GOKHLÉ and F. A. MASON.

"The orienting influence of free and bound ionic charges on attached simple or conjugated unsaturated systems. Part V. Nitration of benzyldiethylsulphonium picrate." By A. POLLARD and R. ROBINSON.

"The mechanism of thermal decomposition of the normal olefins." By R. V. WHEELER and W. L. WOOD.

"Natural glucosides. Part II. The constitution of æsculin." By F. S. H. HEAD and A. ROBERTSON.

"The electrical conductivity of butyric acid–water mixtures." By J. GRINDLEY and C. R. BURY.

"β-Naphtha-1-thioquinone and dehydro-2-naphthol 1-disulphide." By H. A. STEVENSON and S. SMILES.

"The catalytic action of hydrogen on the carbon monoxide flame." By W. E. GARNER and D. A. HALL.

"The syntheses of glucosides. Part V. Two new syntheses of rubiadin, and syntheses of *l*-*O*-methylrubiadin and of rubiadin glucoside." By E. T. JONES and A. ROBERTSON.

" The optical instability of tercovalent carbonium kations. The transformation of *d*-phenylmethylcarbinyl *dl*-*p*-toluenesulphinate into optically inactive α-phenylethyl-*p*-tolylsulphone." By J. KENYON and H. PHILLIPS.

" Studies on hydrogen cyanide. Part II. The compounds formed by the action of the hydrogen halides on hydrogen cyanide." By L. E. HINKEL and R. T. DUNN.

" Triazole compounds. Part III. The alkylation of nitro-1 : 2 : 3-benztriazoles." By O. L. BRADY and C. V. REYNOLDS.

" Strychnine and brucine. Part XI. Note on dihydrobrucine and some derivatives." By O. ACHMATOWICZ, R. C. FAWCETT, (the late) W. H. PERKIN, jun., and R. ROBINSON.

" The solubility of the magnesium mandelates." By A. FINDLAY and A. N. CAMPBELL.

" The purification of some sensitive ketones." By G. A. R. KON.

" Studies in aromatic substitution. Part III. The action of fuming nitric acid on the 3-fluoro-2 : 4 : 6-trihalogeno-phenols and -anisoles." By H. H. HODGSON and J. NIXON.

" Compounds of arsenious chloride and pyridine." By C. S. GIBSON, J. D. A. JOHNSON, and (the late) D. C. VINING.

" A phase-rule study of the cobalt chloride colour change." By H. BASSETT and (in part) H. H. CROUCHER.

" Passivity of metals. Part VI. A comparison between the penetrating powers of anions." By S. C. BRITTON and U. R. EVANS.

" 3-Acetamido-4-hydroxyphenylstibinic acid." By I. E. BALABAN.

" The photochemical reaction between oxygen and hydrogen chloride." By A. J. ALLMAND and R. G. FRANKLIN.

" On the spatial configuration of the single valencies of allene." By C. K. INGOLD and C. W. SHOPPEE.

" Optical activity and the polarity of substituent groups. Part XIV. Influence of substituent poles and dipoles on the rotatory power of *l*-menthyl acetate." By H. G. RULE, R. H. THOMPSON, and (in part) A. ROBERTSON.

" Optical activity and the polarity of substituent groups. Part XV. Phenyl-substituted esters and ethers of *l*-menthol and β-octanol." By H. G. RULE and J. BAIN.

" Direct meta-substitution in the toluene nucleus." By J. B. SHOESMITH and J. F. MCGECHAN.

" Heats of adsorption and isotherms in the system platinum–hydrogen." By E. B. MAXTED.

" The structures of the octahydrocarbazoles." By S. G. P. PLANT.

" Solubility of magnesium neodymium nitrate in water, nitric acid, and magnesium nitrate solutions." By J. A. N. FRIEND.

" Stereoisomerism of disulphoxides and related substances. Part VI. Co-ordination compounds of some disulphides and diamines." By G. M. BENENTT, A. N. MOSSES, and F. S. STRATHAM.

" Tetrabromodimethylquinoxaline." By G. M. BENNETT and G. H. WILLIS.

" The Walden inversion. Part III." By H. N. K. RÖRDAM.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

BRIGGS, DENNIS BROOK. The study of crystals. London 1930. pp. 137. ill. 4*s*. net. (*Recd.* 13/5/30.) From the Author.

CONSTABLE, FREDERICK HURN. A condensed outline of modern physical chemistry. London 1930. pp. 157. 10*s*. 6*d*. net. (*Recd.* 12/6/30.) From the Publishers: Messrs. Ernest Benn.

HOLMYARD, ERIC JOHN. An introduction to organic chemistry. London 1930. pp. xii + 282. ill. 4*s*. 6*d*. net. (*Recd.* 19/5/30.) From the Publishers: Messrs. Edward Arnold & Co.

JAPAN. *National Research Council.* Report. No. 1, 1922, etc. Tokyo 1930 +. (*Reference.*) From the Director.

MENDELÉEFF CONGRESS ON PURE AND APPLIED CHEMISTRY. V, 1928. Papers, etc. 3 vols. Kasan 1928. pp. 150, 32, 32. ill. (*Reference.*) [In Russian.] From the Secretary.

[MERCK, E.] Merck's index. 6th edition. Darmstadt 1929. pp. 644 + 14. (*Reference.*) From the Publisher: Herr E. Merck.

NATIONAL BENZOLE ASSOCIATION and UNIVERSITY OF LEEDS. *Joint Benzole Research Committee.* Seventh report. London 1930. pp. vi + 149. ill. (*Reference.*) From the National Benzole Association.

REALE ACCADEMIA D'ITALIA. Annuario. Vol. I, 1929, etc. Roma 1930 +. (*Reference.*) From the Academy.

THOMS, HERMANN. [Editor.] Handbuch der praktischen und wissenschaftlichen Pharmazie. Vol. V. Part v. Berlin 1930. pp. 981 to 1172. ill. *M*. 10. (*Recd.* 19/5/30.) From the Publishers: Herren Urban & Schwarzenberg.

TRICKS OF TRADE in the adulterations of food and physic; with directions for their detection and counteraction. London 1856. pp. xvi + 191. From Dr. John McCrae.

II. *By Purchase.*

BALCKE, HANS. Die neuzeitliche Speisewasser-Aufbereitung. Leipzig 1930. pp. viii + 138. ill. *M*. 16. (*Recd.* 2/6/30.)

HANDBUCH DER KAUTSCHUKWISSENSCHAFT. Edited by KARL MEMMLER. Leipzig 1930. pp. xxiv + 766. ill. *M.* 60. (*Recd.* 12/6/30.)

HANDBUCH DER KOLLOIDWISSENSCHAFT IN EINZELDARSTELLUNGEN. Edited by WOLFGANG OSTWALD. Vol. IV. Die Globuline. By MONA SPIEGEL-ADOLF. Dresden 1930. pp. xvi + 452. ill. *M.* 35. (*Recd.* 12/6/30.)

HEERMANN, PAUL. [Editor.] Enzyklopädie der textilchemischen Technologie. Berlin 1930. pp. x + 970. ill. (*Reference.*) *M.* 78.

LIPPMANN, EDMUND OSKAR VON. Die Geschichte des Wismuts zwischen 1400 und 1800. Berlin 1930. pp. 42. *M.* 2.80. (*Recd.* 12/6/30.)

SIMMERSBACH, OSKAR. Grundlagen der Koks-Chemie. 3rd edition. By GUSTAV SCHNEIDER. Berlin 1930. pp. vi + 366. ill. *M.* 29. (*Recd.* 12/6/30.)

THIERFELDER, HANS, and KLENK, ERNST. Die Chemie der Cerebroside und Phosphatide. Berlin 1930. pp. viii + 224. *M.* 21.20. (*Recd.* 12/6/30.)

III. *Pamphlets.*

AUSTRALIA, COMMONWEALTH OF. *Council for Scientific and Industrial Research.* Pamphlet No. 17. The mineral content of pastures. Melbourne 1930. pp. 29. ill.

CHIKASHIGE, MASUMI, and UENO, SHÛZÔ. A new coinage metal : forgery detectable without analysis. (World Eng. Congress, Tokyo 1929). pp. 2. ill.

[INDIAN LAC ASSOCIATION FOR RESEARCH.] A short account of the work of the Indian Lac Research Institute. Ranchi 1930. pp. 23.

KOSAKA, HIROSI. Die Beziehungen zwischen den verschiedenen physiologischen Erscheinungen der Pflanzen und den an verschiedenen Vegetationsorganen in Erscheinung tretenden Farbstoffen. I. Ueber die Beziehungen zwischen der Anthozyanbildung und dem Wachstum von *Abutilon avicennae.* (From the *J. Dept. Agric. Kyushu Imp. Univ.*, 1929, 2.)

MIHOLIĆ, STANKO STANKOV. Kemijska analiza alkaličnih kiselica u Donjoj Kostrivnici. Beograd 1930. pp. 16.

MINES DEPARTMENT. *Safety in Mines Research Board.* Paper No. 59. The effect of the rate of cooling on the structure and constitution of steel. By J. M. ROBERTSON. London 1930. pp. 57. ill.

MORRISON, FRANK RICHARD. Ambergris and how to recognise it. (*Sydney Technological Museum Bulletin*, No. 15.)

NEWCOMB, CLIVE, and SANKARAN, GANAPATI. A note on iodine metabolism. (From the *Trans. F.E.A.T.M. 7th Congress*, 1927, **3**.) Calcutta 1929.

NIJK, DIRK ROELOF. Een vergelijkend onderzoek van kerngesubstitueerde phenylphosphine- en phenylarsinezuren. Leiden 1922. pp. x + 73. ill.

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PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Special Meeting, Thursday, October 16th, 1930, at 8 p.m., PROFESSOR J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT stated that the meeting was held for the purpose of unveiling and receiving a Plaque presented by subscribers to the Perkin Memorial Fund and for the delivery of an Oration on the Life and Work of the late Professor W. H. Perkin.

PROFESSOR ROBERT ROBINSON, who was asked by the President to make a statement, said:

"Since I shall have an opportunity on October 25th in the parallel ceremony at Oxford to make my personal tribute to the memory of the late Professor Perkin, my remarks on this occasion may be limited to a formal explanation.

"As Perkin's seventieth birthday approached, a number of his collaborators, academic and scientific, and students formed the idea of presenting him with his portrait as a mark of the esteem and affection in which they held him. The project was organised by a small Committee, and the response of the subscribers was enthusiastic.

"The execution of the scheme was necessarily postponed by the illness of the subject, and in September 1929 we were shocked and grieved by the news of Professor Perkin's death.

"It was decided to transform the proposed compliment into a Memorial, but, acting on technical advice, the idea of a portrait was abandoned, and instead it was decided to have a Bronze Plaque.

"We were fortunate in being able to secure the services of Mr. Ernest Gillick, whose distinguished work is well known to the Fellows of this Society through the Harrison Memorial which adorns our walls.

"You will all agree that the difficulties of posthumous portraiture have been overcome by Mr. Gillick in the present instance, and that he has provided us with a most acceptable likeness of Perkin as we knew him.

" A great advantage of the Plaque over the portrait was that it could be produced in triplicate, and in fact three identical plaques have been made. One is already in Manchester University, the third will be unveiled in the Dyson Perrins laboratory, and the second is appropriately to be presented to-night to the Chemical Society, which has had the honour of publishing almost the whole of Perkin's original work.

" Before this audience it is unnecessary to dilate on the volume and great scientific interest of Perkin's output, but some of the dates of his other connexions with the Society may be recalled.

" He became a Fellow in 1887, and served on the Council and as Vice-President for several terms. He received the Longstaff Medal in 1900, and was President from 1913 to 1915. Almost his last labour in the cause of the science he loved so well was the delivery of the first Pedler Lecture, and he then showed that his hand had lost none of its cunning.

" I now request Mr. A. J. Greenaway to unveil the Plaque."

MR. GREENAWAY then unveiled the Plaque, the company present standing.

PROFESSOR ROBINSON, continuing, said :

" Mr. President, on behalf of the subscribers to the Perkin Memorial Fund, I invite you and the Fellows of the Society to accept this Plaque."

In acknowledging the gift, the PRESIDENT said :

" Professor Robinson, on behalf of the Council and Fellows I have to thank you, and through you the Members of the Memorial Fund Committee, for this Plaque, which will be placed in a prominent position in our rooms and treasured as a memorial of one of our most distinguished Fellows.

" Professor William Henry Perkin showed throughout his life that he held in the highest esteem the aims and objects for which this Society was founded, and his services as Councillor, Vice-President, and President will be remembered as examples of his devotion to its work. Our Journal contains most of the large number of scientific communications he published, and these stand as a record of achievement surpassed by few.

" It is probable that the Plaque will have only a temporary home in these premises, but you can be assured that when our new building is ready it will be placed in a prominent position among, I hope, a number of other memorials of our distinguished dead. As a Society we are singularly lacking in these, and I hope that

this will be borne in mind when we occupy our new premises. It is indeed remarkable that we have no memorial, for example, of Sir William Ramsay. It is fitting that this Plaque should have been prepared in triplicate, and that one should be placed in Manchester, another in London, and a third in Oxford, the places in which his greatest work was carried out."

PROFESSOR W. N. HAWORTH, who was then called upon by the President, delivered the following oration on the Life and Work of the late Professor Perkin :—

An Appreciation of the Life and Work of Professor W. H. Perkin.

" There are occasions when it is meet and wise for us to turn aside from our usual avocations in order to praise famous men.

" Professor W. H. Perkin, whom we commemorate to-day, was deserving of every mark of honour that his pupils and colleagues could bestow. His fame as a teacher and investigator surpassed all ordinary standards, and his memory will continue to inspire those whom he moulded by his influence and supported by his encouragement and example.

" It had been the intention of the subscribers to make this event a celebration of Perkin's seventieth birthday had not death intervened and changed an occasion of joy into a memorial. Generations of his students have united to show gratitude and reverence to a consummate master, and to express a devotion which lapse of time did not impair. All who knew him as a Professor in the classroom experienced his unique power as a teacher, while those who were privileged to be his research pupils were conscious of being laid under a debt of obligation which could never be repaid.

" Perkin's span of life was co-extensive with the rise and development of modern structural chemistry. Born in 1860, he was a boy at school when Kekulé propounded his benzene formula. The quadrivalency of carbon had been enunciated only two years before. Hofmann was still Professor at the Royal College in Oxford Street, and Perkin, senior, had achieved early success in establishing the industry of synthetic dyestuffs. To the son of such a father there never seemed to be any doubt as to his choice of a vocation.

" Mr. Greenaway has recalled how W. H. Perkin, junior, outshone all his contemporaries among the chemistry students at South Kensington under Sir Edward Frankland; how he speedily worked through the ordinary course of instruction and proceeded beyond it; how he was provided with facilities for the pursuit of more advanced experiments and research. In 1880

there appeared in our *Journal* Perkin's first paper, published conjointly with Dr. W. R. Hodgkinson of the Royal College, his first teacher (along with Mr. Greenaway) in practical chemistry. Eventually, under Dr. Hodgkinson's persuasion, reinforced with that of Mr. Greenaway, W. H. Perkin, senior, was induced to give consent for his son to proceed to Germany to study under Wislicenus. Under the guidance of Wislicenus at Würzburg Perkin soon won recognition, and in his Wislicenus Memorial Lecture he has placed on record his obligation to this great teacher: 'The intellectual development of young chemists was to Wislicenus a study as absorbing as any of his chemical problems.' Perkin graduated at Würzburg in 1882, and proceeding from there to Munich, he found, during his four years' association with Adolf Baeyer, his real spiritual home. 'There was something in Perkin which responded to every note struck by the older man, who became the object of a lifelong intellectual devotion.' Of the excellence of Baeyer's experimental methods Perkin always spoke with enthusiasm. After a short time he won Baeyer's warm approbation, and became in turn Privat-dozent and research assistant. It was here that Perkin began that series of researches, which he continued with such zeal and success, on the synthesis of closed carbon chains. The history of this early development of the chemistry of the *cyclo*-paraffins has been sketched for us in his Pedler Lecture. He returned to this topic again and again, nor did he leave it finally until he had synthesised every naturally occurring monocyclic terpene and investigated the constitution of camphor and its analogues. In recognition of this work, he received at an earlier age than is usual the Davy Medal of the Royal Society.

"It would be a mistaken impression if it were gathered that Perkin during all these strenuous days was a man of one interest only. From early boyhood he had been imbued with a love of music, which had been fostered by his father and uncle throughout his home life. Every member of Sir William Perkin's family played at least one musical instrument, and together they constituted an orchestra of no mean accomplishment. W. H. Perkin, junior, played the violin and the piano, and from the latter instrument he became inseparable for at least part of every day of his life.

"As a student at Würzburg contemporaneously with Perkin was another Royal College man, Thomas Purdie, later Professor of Chemistry at St. Andrews. Both from Purdie and Mrs. Purdie, who had married before going to Würzburg, I heard something of Perkin's mode of life in Germany. The Purdies lived in furnished rooms in Würzburg, and Perkin often visited them in the evenings after a long day's work in the laboratory, staying afterwards for

supper, and also to help in washing and drying the dishes. Purdie was amazed at the younger man's vitality, for leisure from strenuous research did not mean to him resting, but took the form almost nightly of visits to the theatre or the ballroom. So much so that Purdie remonstrated with him, and suggested that he might undermine his health. But Perkin's answer was that he found it a mental relaxation, and also the best way of learning German well and of familiarising himself with German life and custom. There can be no doubt that his experiences at this time, and especially afterwards at Munich, expanded his outlook on many aspects of life and made him a shrewd and excellent judge of men. [It was characteristic of Perkin later in life that he was never taken in by bluff or guile. One swift retort silenced those who had the audacity to attempt it. His reminiscences of a few such occasions provided him with amusing anecdotes.]

" Returning to this country from Munich in 1886, he worked for a short time in Manchester at the invitation, and by the courtesy, of Professor H. B. Dixon, and here he began the investigation of the natural colouring matters, brazilin and hæmatoxylin. Shortly afterwards he was called to his first Chair at the Heriot Watt College, Edinburgh, which he held for six years. At Edinburgh he commenced the series of researches on the alkaloids berberine, and cryptopine; the constitution of these and of other alkaloids was finally established many years later in collaboration with Professor Robinson, and by their synthesis.

" On the death of Schorlemmer, Perkin was invited to the Chair of Organic Chemistry in Owens College, Manchester, in 1892. It was now possible for him to build up a great School of Research, and it was here that he entered upon that exceedingly productive period which he once spoke of to me as his ' golden age ' of research. Fischer once declared that it rivalled his own school at Berlin. The large Schorlemmer laboratory was filled by his students, and later there was added the Perkin private laboratory, together with the splendid building which had been the working home of Dr. Edward Schunck. The latter comprised the large, beautifully furnished library with Schunck's collection of books and the suite of laboratories. The building was removed, brick by brick, from Kelsall near Manchester, and re-erected as an annexe to the University. In the library one combined one's study of the chemical journals with the contemplation of the signs of the Zodiac which decorated the ceiling. This commodious series of rooms satisfied the needs of a large staff of research workers for many years, until the extension of the Morley laboratories was added.

" There is no doubt that Perkin found his work in Manchester

very congenial. On four mornings a week he lectured at 9.30, and on two of these mornings, in preparation for the general class, he arrived at 8.30 or a quarter to nine to superintend his assistant's arrangement of the lecture-table. It was common knowledge that before he appeared at the laboratory he had occupied himself from 6 a.m. with practice at the piano or in the cultivation of his garden. He illustrated the more elementary lectures of the general class by numerous experiments, which were elaborated with meticulous care. Up to the moment of his entering the lecture-room he was preoccupied with his notes and with the sketching anew of such formulæ as he wished to illustrate on the blackboard. He took his lectures very seriously, and spent much nervous energy in his preparation for the delivery of them. He spoke in clear tones, with an easy flow of words, and the precise arrangement of his formulæ and other details on the blackboard was ideally perfect. It is here that he excelled in the little comparisons or summaries of salient properties which he presented, and as a prelude to which he invariably announced, 'Let us now make a little table!' In the advanced class his lectures covered, with great clearness of treatment, the more conspicuous researches on a selected group of products, and also dealt with important synthetic methods. He developed a habit which had the effect of impressing students with the intimacy between his lectures and the original papers themselves, and this was achieved by some such phrase as 'I was reading again Victor Meyer's original paper on this subject last night.' One's notes on these lectures are as interesting after twenty-five years as on the day they were given.

"The rest of Perkin's day was devoted to research students and to experimental work at his bench until 3.30 or 4 o'clock, with never more than an interval of half an hour for lunch at 12.30. Beginning at one end of a large clear bench stocked with newly washed and dried apparatus (he always kept a washing-up boy busy), he gradually accumulated the soiled beakers and test-tubes at the other end, until there was little working space left, and then he went home. But within the space of four hours he contrived to get through more work than any of his collaborators could accomplish in twice the time. The evening was available for entertainment, orchestral music in his drawing-room with invited friends or musicians from the Hallé, or, in the case of most evenings, for the composition and writing of his original papers, which he always typed himself. A privilege he afforded to his senior research workers was to be invited to hear music at his house and to meet distinguished guests from other Universities or from the Continent.

"To see Perkin at work was a mental stimulus and inspiration.

His skill in manipulation, combined with his judgment and observation, filled one with wonder. He could coax a reaction into being and maintain it under control by what seemed very simple means, while, pencil in hand, and as the reaction proceeded, he would carefully record every change of appearance or condition. It was not only from the final achievement of his inquiry that he derived pleasure. He extracted genuine enjoyment and delight from witnessing a reaction and making a record of it.

" From his long and varied experience he had acquired an insight into chemical behaviour which was well-nigh uncanny; and his quick judgment on the nature of his products was equally remarkable. An unwanted by-product was detected as such almost at a glance, whilst the important and desired product was seized upon with unerring certainty. By his co-workers it came to be regarded as sufficient and final evidence that a reaction did not ' go ' if Perkin failed in his attempt of it. Visitors to his laboratory must often have found him in one of the characteristic attitudes which he assumed when at work. His personal appearance at this time had not undergone that transformation which occurred when he shaved off his full beard. Standing at his bench (he never sat down except to consult ' Beilstein ' at his table or to take a melting point) controlling the vacuum distillation of a frothing liquid in a Claisen flask by directing on to the walls of it a long ' stiff ' Bunsen flame, and with the other hand gathering the fractions of distillate into the receiver attached to his ' Perkin triangle '; or, with filter funnel and fluted paper in readiness, dissolving a crude solid in a wide test-tube preparatory to its crystallisation; then, in brief minutes, the garnering of the ' beautiful crystals ' on his large platinum spatula. An envious but irreverent pupil once said of Perkin that he could induce any substance to crystallise for the reason that out of the vast number and variety of crystalline products he had handled of every geometrical form he always secreted a suitable nucleus in his beard.

" He often worked on the very small scale, but those who were associated with him well knew that such a trifle as the scarcity of a material never deterred him. When he had come to a decision to proceed with a synthesis or a breakdown process, a research collaborator would be invited to undertake large-scale operations involving the consumption of kilograms of initial reagents. The preparation would be carried from stage to stage, Perkin himself undertaking the purification of the intermediate products, until the desired amount of the necessary starting material was forthcoming for the new work which was projected. The expense was a secondary consideration.

" A means by which Perkin controlled the results of his co-workers before publication was by having all important analyses carried out by his assistant. In the Manchester days this duty fell to his private research assistant, and in my own experience of these duties I well remember how he presented me one day with a newly prepared substance, the appearance of which gave me some surprise, and Perkin noticed my hesitation. It was a lustrous black material resembling coal, not at all like the ' beautiful crystals ' he was so much in the habit of describing. The analysis was carried out and the result handed to him, with which he seemed pleased. Then I learned that he had dreamt the previous night of a new reaction he might try with brazilin in the expectation of a new oxidation product, and, on his trying it out, my analysis had confirmed his dream.

" Perkin's close and intimate interest in the work of his pupils, and the help and encouragement he gave them, resulted in an *esprit de corps* and a personal loyalty to himself which were the greatest incentive to good work and to the progress of research. Each put his best into the work of the school. Hours were long, but there was great concentration, and all displayed keenness to succeed. Seldom did the type of man remain who confessed that he did only a ' sporting ' amount of work. To Perkin it seemed incomprehensible that any one who claimed chemistry as a profession should fail to take an interest in original research, and such a one he held to be of little account.

" In an atmosphere which was charged with Perkin's keenness and zeal, scientific investigation could not do other than flourish, and the school grew round the man, bringing with it success and wide recognition.

" With Perkin research was a ruling passion which he communicated to everyone who worked with him, and it is sufficient to say that many of his pupils when placed in other environments found their sustaining force in Perkin's example. Some will recall the different atmosphere they encountered when they moved on and discovered that in some quarters original research was considered of little account, and even a hindrance to the fulfilment of one's teaching duties. If that feeling no longer exists in the Universities in this country, and if the participation in the extension of the boundaries of knowledge has become recognised and has taken its place among the chief duties of a University teacher, then that reform is due in considerable measure to the persistence with which it was advocated by Perkin and a few others who were his contemporaries. Professor Meldola, in a moving appeal which he made in his Presidential Address to this Society in 1907, deplored the meagreness of the research spirit of that period in the British

Universities and Colleges. Professor Meldola said, 'It is only necessary to call to mind the productive activity in the Continental Universities as compared with our own. Judged by this standard, there can be only one conclusion—that many of our Universities are distinct failures as centres of chemical research, and that the total output of work from University laboratories is by no means worthy of the great traditions of this country as a pioneering nation in scientific discovery.' He went on to say, 'From . . . University laboratories we receive occasional communications, these being for the most part the work of the Professors. But with the exception of Manchester, it cannot be said that in any of our Universities has there been called into existence an active centre of chemical research in a school in the Continental sense of the term.' This service Perkin rendered at a critical time in the history of chemistry in Britain. He founded a school which, like that of Meldola, of Armstrong and of a few others, won a place of honour for organic chemistry in this country.

"Of Perkin's later life and work at Oxford from 1912 to 1929 Professor Robinson will doubtless speak in the course of the next few days when a similar memorial is to be unveiled in the laboratories there. Sufficient is it for me to say that the great work that Perkin did for Oxford is appreciated nowhere more than in Oxford itself.

"To those who sought his advice about their promotion to better appointments Perkin invariably gave the same characteristic answer: 'If you put all your abilities into the doing of important original work there can be not the least doubt that your merit will be recognised.' He never used his great influence unduly on behalf of an aspirant. But whenever he was impressed by a piece of work which one of his former pupils had published he never failed to write him an appreciative and encouraging letter.

"In the too early death of Perkin, Chemistry has lost one of the most powerful exponents of the science that this country has known. We shall miss from our midst his impressive, kind personality, and we shall miss, too, the continuance of the brilliant experimental papers which, over a period of fifty years, he contributed to our English *Journal*. But in our appreciation of his life and his achievements, the feeling which will remain dominant in our minds is one of gratitude for a great leader, who consecrated his ability and intellect to the one ideal for which this Society exists, the ideal embodied in the creed—'that original research is in itself and by itself the most powerful weapon that ever can be wielded by mankind in struggling with the great problems which nature offers on all sides for solution.'"

Ordinary Scientific Meeting, Thursday, October 23rd, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

In referring to the death of Professor H. B. Dixon the PRESIDENT said:

"I have with deep regret to announce the death of Professor Harold Baily Dixon, of Manchester University, which occurred suddenly on September 18th last.

"The Council at its meeting on October 2nd passed the following resolution:

> "The President, Council, and Fellows of the Chemical Society desire to express their deep sorrow at the death of Professor Harold Baily Dixon. They recall with gratitude his eminent services to the Society as Councillor, Vice-President, and President, and mourn the loss of one who, by his pioneer work on the nature of explosions in gases, has added notably to the advancement of chemical science.
>
> "They desire to convey their sincere sympathy to Mrs. Dixon and family in the great loss they have sustained."

"Professor Harold Baily Dixon was born on August 11th, 1852, and was the second son of William Hepworth Dixon, for some years editor of the *Athenæum*. He was educated at Westminster School and at Christ Church, Oxford, subsequently being elected to Fellowships at Trinity College (1875) and at Balliol College (1881).

"It is just fifty years ago—that is, at the Swansea meeting of the British Association in 1880—that Dixon described his epoch-making discovery to the effect that carbon monoxide and oxygen in combining proportions cannot be ignited by the electric spark if the mixture has been previously subjected to prolonged drying over phosphoric anhydride. The importance of this discovery can hardly be over-estimated. It gave an impetus to research on gaseous explosions which was destined, during the succeeding fifty years, to produce a wealth of new knowledge, to the accumulation of which Dixon and his pupils were the main contributors. He quickly became the acknowledged leader in this field, to which he devoted his life's work.

"Appointed to succeed Sir Henry Roscoe at Owens College in 1886, he rapidly established there a school of research from which he sent pupils to all parts of the world. He retired in 1922 at the age of seventy, but retained his research laboratory in the University. At the time of his death he was actively engaged on

important research work for the Safety in Mines Research Board, and was, indeed, at work on the morning of the day he died.

" He gave this Society full measure of service. He was a Member of Council from 1892 to 1896 and President from 1909 to 1911. He served as Vice-President for no less than nineteen years."

The PRESIDENT also announced the death of Joseph Achille Le Bel (Honorary Fellow), which occurred on August 6th, 1930. He stated that the name of Le Bel with that of van 't Hoff would always be associated with the classical researches on the tetrahedral structure of the carbon atom.

The PRESIDENT then referred to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	Died.
Tom St. John Belbin	June 18th, 1891.	Sept. 27th, 1930.
Arthur Horrobin	May 7th, 1908.	Feb. 20th, 1930.
Qasim Ali Mansuri	May 5th, 1921.	Mar. 10th, 1930.
John T. A. Walker	Dec. 6th, 1900.	July 27th, 1930.

The PRESIDENT announced that :

1. The following Address of Congratulation had been sealed in Council on October 2nd, and had been presented to the University of Birmingham on the occasion of the Jubilee of the Foundation of Mason Science College and the 30th Anniversary of the granting of the Charter to the University of Birmingham on Monday, October 13th, 1930 :

THE CHEMICAL SOCIETY
to the
UNIVERSITY OF BIRMINGHAM.

The President, Officers, Council, and Fellows of the Chemical Society offer to the Chancellor and Council of the University of Birmingham their sincere congratulations on the occasion of the JUBILEE of the FOUNDATION of MASON SCIENCE COLLEGE and the THIRTIETH ANNIVERSARY of the GRANTING of the UNIVERSITY CHARTER.

The Munificent Benefaction of Sir Josiah Mason, and the devoted efforts of the Council and Staff of the College established in Birmingham a centre of Higher Education for the Midland Counties which rapidly became of national importance. The grant of the University Charter in 1900 was a fitting recognition of the great achievements of Mason Science College and gave a stimulus to the further development which, in twenty years, has raised the University of Birmingham to a prominent place among the Universities of the world.

In conveying the good wishes of the Chemical Society for the continued welfare and prosperity of the University of Birmingham in all its Faculties, the Council places on record its high appreciation of the fundamentally important investigations which have been carried out under the auspices of those who have occupied the Chair of Chemistry in the Mason Science College and the University.

Signed on behalf of the Chemical Society,

JOCELYN THORPE, *President.*
T. SLATER PRICE, *Treasurer.*
L.S. C. S. GIBSON, T. S. MOORE, *Secretaries.*
F. G. DONNAN, *Foreign Secretary.*

Sealed in Council this Second Day of October, One Thousand Nine Hundred and Thirty.

BURLINGTON HOUSE,
LONDON, W. 1.

2. The death of Professor Dixon necessitated an alteration being made in the delivery of the Liversidge Lecture, which he was to have given on November 27th. The Council has asked Professor W. A. Bone, D.Sc., Ph.D., F.R.S., to deliver the Third Liversidge Lecture, and he has agreed. He has chosen as his title "Fifty Years' Experimental Research upon the Influence of Steam on the Combustion of Carbonic Oxide (1880–1930)." The Lecture will be illustrated by experiments and lantern slides and will be delivered in the Lecture Theatre of the Imperial College of Science and Technology (by the courtesy of the Governors) on Thursday, December 11th, 1930, at 5.30 p.m.

Messrs. L. A. Warren and F. Bryans were formally admitted Fellows of the Chemical Society.

Forms of Recommendation for Fellowship were read for the first time in favour of :

Frederick George Angell, B.Sc., 32, Pinner Road, Harrow.
William Edward Batten, A.R.C.S., 41, Calais Gate, Myatts Park, S.E. 5.
Ernest George Beckett, Ph.D., F.I.C., Gilmerton, Larbert, Stirlingshire.
Hugh Kenneth Black, B.Sc., 63, Middle Street, Brighton.
George Frederic Bloomfield, B.Sc., A.R.C.S., 27, Belmont Avenue, Tottenham, N. 17.
John Bradley, B.A., B.Sc., 25, Lamel Street, York.
Dhirendra Nath Chakravarti, M.Sc., King Edward College, Amraoti, India.
Frederick Charles Clapham, 90, The Portway, West Ham, E. 15.
Ernest Gordon Cox, B.Sc., 352, Shirley Road, Acocks Green, Birmingham.
Harold Albert Hadleigh Crowther, Claremont, Cedar Road, Croydon.

Arthur Lawrence Fox, B.A., M.S., Ph.D., 1103, Blackshire Road, Wilmington, Delaware, U.S.A.
Herbert Freundlich, Prof., Ph.D., Enzianstrasse 3, Berlin-Lichterfelde, Germany.
Bhawan Showkiram Gidvani, B.Sc., c/o The American Express Co., 6, Haymarket, S.W. 1.
Joseph Glassman, B.Sc., 108, Goldsmith's Row, Hackney, E. 2.
Evelyn Reid Lindsay Gow, B.Sc., 31, Windsor Street, Dundee.
Arthur Neville Hambly, 15, Moubray Street, Melbourne, Australia.
Ralph Gordon Harry, 183, Cathedral Road, Cardiff.
Margaret Mary Healey, B.Sc., 79, Pope's Avenue, Twickenham.
Robert Haxwell Hicks, B.Sc., 65, Romilly Road, Cardiff.
Cyril Gustav Bidwell Hose, A.R.C.S., 36, Vartry Road, Stamford Hill, N. 15.
George Harold Jeffery, B.Sc., Redbourne, Lordswood Avenue, Bassett, Southampton.
Matsusuke Kobayashi, Prof., D.Sc., Chemical Institute, Tohoku Imperial University, Sendai, Japan.
Ralph Arthur Letch, A.R.C.S., Ebenezer Cottage, Shenley, near Barnet.
William Byres McKay, B.Sc., 20, Dundee Road, Forfar.
George W. G. Maclennan, M.A., B.Sc., 9, Park Walk, Chelsea, S.W. 10.
John Macniven, Lohat P.O., District Darbhanga, B. & N.W. Rly., India.
Roy James Macwater, B.Sc., Anglesea, Maple Road, Ashtead, Surrey.
Kishen Lal Malhotra, M.Sc., 52, Claremont Road, Highgate, N. 6.
Ernest Gilbert Noble, A.R.C.S., 22, Dartmouth Park Road, N.W. 5.
Clifford Arthur Rhodes, B.Sc., 38, Granny Lane, Mirfield, Yorks.
Anthony Melland Robinson, B.A., The Châlet, Lindfield, Sussex.
Chandulal Chhotalal Shah, M.Sc., East London College, Mile End Road, E. 1.
George Basil Stafford, B.Sc., 12, The Grove, Southey Street, Nottingham.
John Frederick Felix Trotter, B.Sc., A.R.C.S., 83, Mildred Avenue, Watford.
Evelyn Marie Waldron, B.Sc., The Cedars, Little Marlow Road, Marlow, Bucks.
Eric Mervyn Watson, B.Sc., A.I.C., c/o Agent-General for Western Australia, Savoy House, Strand, W.C. 2.
Evan Clifford Williams, D.Sc., 131, Alvarado Road, Berkeley, Cal., U.S.A.
Patrick Chisholm Young, B.A., c/o Messrs. John Heathcoat & Co., Tiverton, Devon.

The following Forms of Recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2) :

John Christie, 174, Eighth Avenue, Mayfair, Johannesburg.
Harold Hinde, 135, Grey Street, Bulawayo.
Gilbert Hayes Whiteford, 1612, S. College, Fort Collins, Col., U.S.A.

The following papers were read :

" Dynamic isomerism involving mobile hydrocarbon radicals. Part II. The intramolecular character of the amidine rearrangement." By A. W. CHAPMAN.

" Dynamic isomerism involving mobile hydrocarbon radicals. Part III. Some effects of substitution on the velocity of

interchange and position of equilibrium of isomeric triarylbenzenylamidines." By A. W. CHAPMAN and C. H. PERROTT.

"The unsaponifiable matter from the oils of elasmobranch fish. Part VII. The synthesis of α-glyceryl ethers and the constitution of batyl, selachyl, and chimyl alcohols." By G. G. DAVIES, I. M. HEILBRON, and W. M. OWENS.

"The unsaponifiable matter from the oils of elasmobranch fish. Part VIII. The structure of the naphthalene hydrocarbon derived from squalene." By I. M. HEILBRON and D. G. WILKINSON.

THIRD LIVERSIDGE LECTURE.

The Third Liversidge Lecture, entitled "Fifty Years' Experimental Research upon the Influence of Steam on the Combustion of Carbonic Oxide (1880–1930)," will be delivered by Professor W. A. Bone, D.Sc., F.R.S., on Thursday, December 11th, 1930, at 5.30 p.m., in the Lecture Theatre of the Imperial College of Science, South Kensington, S.W. 7 (by the kind permission of the Governors).

RESEARCH FUND.

A meeting of the Research Fund Committee will be held in December next. Applications for grants, to be made on forms obtainable from the Assistant Secretary, must be received on or before Monday, December 1st, 1930. Applications from Fellows will receive prior consideration.

All persons who received grants in December 1929, or in December of any previous year, whose accounts have not been declared closed by the Council, are reminded that reports must be returned by December 1st.

Attention is drawn to the fact that the income arising from the Donation of the Worshipful Company of Goldsmiths is to be more or less especially devoted to the encouragement of research in Inorganic and Metallurgical Chemistry, and that the income from the Perkin Memorial Fund is to be applied to investigations relating to problems connected with the Coal Tar and Allied Industries.

ANNUAL REPORTS.

The price of the Annual Reports for 1930, Volume XXVII, will be 5*s*. 6*d*. to those Fellows who apply before December 31st, 1930.

Application should be made to the Assistant Secretary, and must be accompanied by a remittance.

SPECIAL PUBLICATIONS OF THE SOCIETY.

Fellows are reminded that the following publications can be obtained at the reduced prices mentioned :

	Price.
Memorial Lectures, Vol. I (1893–1900) . .	9*s.* post free.
,, ,, Vol. II (1901–1913) . .	7*s.* ,,
Faraday Lectures (1869–1928) . . .	5*s.* 6*d.* ,,
Photographs of Eminent Chemists, set of 8 .	18*s.* ,,
,, ,, ,, each .	2*s.* 6*d.* ,,

There are also available a few sets of the *Berichte der Deutschen Chemischen Gesellschaft* from 1915 to 1924 (inclusive). Price £22 the set, or £2 5*s.* per annum.

The attention of Fellows engaged in teaching Chemistry is directed to the fact that the Volumes of *Memorial Lectures* and the Volume of *Faraday Lectures* are eminently suitable for presentation as prizes, and the Council would welcome any steps Fellows can take to make these volumes known.

BRITISH CHEMICAL ABSTRACTS "A" FOR 1931.

(*Printed on one side of the page only.*)

The Abstracts "A" (Pure Chemistry) for 1931, printed on one side of the page only, will be issued to Fellows who make application by December 31st, 1930, price £1 10*s.* A remittance for this amount must accompany each application.

PUBLICATIONS OF OTHER SOCIETIES.

Fellows of the Chemical Society who are not members of the Society of Chemical Industry, the American Chemical Society, or the Dutch Chemical Society, may procure the publications of these Societies for 1931 at the following prices :

SOCIETY OF CHEMICAL INDUSTRY.

	Price.
(*a*) Abstracts in Applied Chemistry (exclusive of Index)	£1 10*s.* post free
(*b*) Annual Reports of the Progress of Applied Chemistry for 1930	10*s.* ,,
(*c*) Abstracts in Applied Chemistry (printed on one side of the page only)	£2 10*s.* ,,

Application should be made direct to the Secretary, Society of Chemical Industry, 46 and 47 Finsbury Square, E.C. 2, and should reach him by December 31st, 1930. Fellows resident abroad should apply by return of mail.

AMERICAN CHEMICAL SOCIETY

		*Postage.**
(*a*) Journal of the American Chemical Society . .	$6.25	$1.50
(*b*) Chemical Abstracts	$6.25	$1.50
(*c*) Industrial and Engineering Chemistry . . .	$6.25	$1.50
Price for all three Journals	$15.00	$4.50
Price for any two Journals	$11.50	$3.00
(*d*) Chemical Reviews	$4.00	$0.50

Application should be made direct to the Secretary, American Chemical Society, Mills Building, Washington, D.C., U.S.A., and should be sent as soon as possible.

(*e*) Journal of Physical Chemistry . . . . . $8.00 post free

Application should be made to Mr. W. W. Buffum, The Journal of Physical Chemistry, 654 Madison Avenue, New York City, U.S.A.

* One-half postage rates to Canada. No postage charges to countries in the Pan-American Union and Spain.

NEDERLANDSCHE CHEMISCHE VEREENIGING

(*a*) Chemisch Weekblad . . . . . Fl. 10.25 post free

(*b*) Recueil des travaux chimiques des Pays Bas . . Fl. 11.50 ,,

Application to be made to Dr. A. D. Donk, Nederlandsche Chemische Vereeniging, Verspronckweg, 100, Haarlem, Holland.

NOTE.—*A remittance, made payable to the Society concerned, must accompany each application.*

List of Papers, or Abstracts thereof, received between June 19th and October 23rd, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting, or which have appeared in the Journal.)

" Studies in the naphthalene series. Part II. Some diaryl- and triaryl-methane derivatives of dimethyl-α-naphthylamine." By B. GOKHLÉ and F. A. MASON.

" On the reaction of metals of the alkali or the alkaline-earth group (including magnesium) with water, acids, and alkali hydroxide solutions." By I. IITAKA.

" Phase-rule studies on metallic thiocyanates. Part I. The systems $Ba(CNS)_2$–NaCNS–H_2O and $Ba(CNS)_2$–KCNS–H_2O at 25°." By V. J. OCCLESHAW.

" The reduction of substituted *p*-benzoquinones by sulphur dioxide alone and in the presence of alkali." By J. W. DODGSON.

" The decomposition of diazobenzene sulphate by aliphatic alcohols." By H. H. HODGSON and A. KERSHAW.

" Catalytic decomposition of some gaseous ethers." By P. A. K. CLUSIUS.

"The complexity of phosphoric oxide." By A. SMITS.

"The conductivity of some uni-univalent salts in ethyl alcohol." By E. D. COPLEY, D. M. MURRAY-RUST, and SIR HAROLD HARTLEY.

"The mobility of the perchlorate ion in methyl alcohol." By E. D. COPLEY and SIR HAROLD HARTLEY.

"Degradations in the sugar group." By V. DEULOFEU.

"On the original body of vitamin-*B*." By B. TANAKA.

"Trypanocidal activity and chemical constitution. Part II. New sulphur derivatives of aromatic organic arsenicals (*continued*). Derivatives of 2-thiolbenziminazole-5-arsenic acid." By J. G. EVERETT.

"A few remarks on the paper by (Miss) Tempe M. Fenton and William Edward Garner entitled 'The heats of association of acetic and heptoic acids in the vapour state.'" By H. DOHSE and M. DUNKEL.

"Aromatic acid amides. Part I. The preparation of benzamide." By C. H. KAO and S. MA.

"Stereoisomerism in substituted 1 : 2 : 3 : 4-tetrahydroquinolines. Part II." By S. G. P. PLANT and R. J. ROSSER.

"The calculation of activity coefficients from solubility measurements. Part II. Thallous iodate." By C. W. DAVIES.

"The calculation of activity coefficients from solubility measurements. Part III. The unsymmetric valence type effect." By C. W. DAVIES.

"The correlation of certain photochemical reactions and wavelength. Part I." By F. C. HYMAS.

"The interaction between alkyl Grignard reagents and arsenic trichloride." By W. J. C. DYKE and W. J. JONES.

"The ionisation constants of some chloro- and nitro-anilines by the partition method." By G. WILLIAMS and F. G. SOPER.

"Some 4-alkyl derivatives of 1-phenyl*cyclo*hexane-3 : 5-dione." By I. H. S. MATTAR, J. J. H. HASTINGS, and T. K. WALKER.

"Germanium. Part VIII. The action of ammonia on germanium tetrachloride–germanium imide." By J. S. THOMAS and W. PUGH.

"The structure of *iso*anethole." By G. D. GOODALL and R. D. HAWORTH.

"On the formation of *p*-diphenylbenzene." By J. E. SISSON.

"Polycyclic aromatic hydrocarbons. Part II. Derivatives of 1 : 2 : 5 : 6-dibenzanthracene and 1 : 2 : 7 : 8-dibenzanthracene." By J. W. COOK.

"The potential of the iridi-iridochloride electrode." By H. TERREY and H. C. BAKER.

" Studies in the sterol group. Part XI. The relationship of the fully saturated derivatives of ergosterol and sitosterol." By F. S. SPRING.

" Synthesis of alkyl naphthalenes. Part II. 1 : 3 : 5- and 1 : 3 : 8-Trimethylnaphthalene." By I. M. HEILBRON and D. G. WILKINSON.

" Note on the parachor and valency." By T. IREDALE.

" Metallic hydroxy-acid complexes. Part V. Neutral α-cupritartrates." By E. E. WARK and I. W. WARK.

" The latent heats of evaporation of nitromethane and benzonitrile." By J. C. PHILIP and S. C. WATERTON.

" The parachor and chemical constitution. Part XV. The constitution of sulphinium and ammonium mercuri-iodides (iodomercuriates)." By H. J. CAVELL and S. SUGDEN.

" The constitution of double sulphonium mercuric iodides. The optically active tri- and tetra-iodomercuriates and cadmium tetra- and penta-iodides derived from *l*-methylethylphenacylsulphonium iodide." By M. P. BALFE, J. KENYON, and H. PHILLIPS.

" A labile compound of benzeneazo-β-naphthol and β-naphthol." By H. H. HODGSON and W. ROSENBERG.

" A general method for the preparation of thiocyanine dyes. Some simple thiocarbocyanines." By N. I. FISHER and F. M. HAMER.

" The synthesis of di*iso*propylmalonic acid and some related compounds; with some observations on the polar character of the *iso*propyl radical." By F. C. B. MARSHALL.

" Aromatic arsenic compounds containing sulphur groups attached to the nucleus. Part II. Thiocyano- and disulphido-groups." By H. J. BARBER.

" Researches in the menthone series. Part VII. The condensation of menthylamines with *d*- and *l*-oxymethylenecamphor." By J. READ and C. C. STEELE.

" Analogues of the diphenylhydroxyethylamines. Part I. Di-*p*-methoxyphenylhydroxyethylamine and di-3 : 4-methylenedioxyphenylhydroxyethylamine." By J. READ and I. G. M. CAMPBELL.

" Analogues of the diphenylhydroxyethylamines. Part II. β-Phenyl-β-hydroxyethylamine and some derivatives." By J. READ and (MISS) I. G. M. CAMPBELL.

" Digitalis glucosides. Part II. Digoxigenin, the aglucone of digoxin." By S. SMITH.

" Stereochemical influences on aromatic substitution. Substitution derivatives of 5-hydroxyhydrindene." By W. H. MILLS and I. G. NIXON.

"The photochemical union of hydrogen and chlorine. Part I. The effect of light intensity." By A. J. ALLMAND and E. BEESLEY.

"The photochemical union of hydrogen and chlorine. Part II. The effect of wave-length measurements with filtered light." By A. J. ALLMAND and E. BEESLEY.

"The interaction between iodine pentoxide and nitric oxide." By M. S. SHAH and T. M. OZA.

"The organic compounds of gold. Part I. Diethyl-gold bromide and some derivatives." By C. S. GIBSON and J. L. SIMONSEN.

"Syntheses with ββ′-dichlorodiethyl ether. Part I. Some derivatives of tetrahydropyran." By C. S. GIBSON and J. D. A. JOHNSON.

"Isolation of a new complex hydrocarbon of the probable formula $C_{16}H_{14}$." By C. S. GIBSON and J. D. A. JOHNSON.

"Researches in the menthone series. Part VIII. Further characterisation of the optically active menthylamines." By J. READ and R. A. STOREY.

"The structure of carbohydrates and their optical rotatory power. Part I. General introduction." By W. N. HAWORTH and E. L. HIRST.

"The structure of carbohydrates and their optical rotatory power. Part II. 4-Glucosido-α-mannose and its derivatives." By W. N. HAWORTH, E. L. HIRST, H. R. L. STREIGHT, H. A. THOMAS, and J. I. WEBB.

"The structure of carbohydrates and their optical rotatory power. Part III. 4-Galactosido-α-mannose and its derivatives." By W. N. HAWORTH, E. L. HIRST, (MISS) M. M. T. PLANT, and J. W. REYNOLDS.

"The structure of carbohydrates and their optical rotatory power. Part IV. Derivatives of α- and β-methylmannopyranoside." By H. G. BOTT, W. N. HAWORTH, and E. L. HIRST.

"The structure of carbohydrates and their optical rotatory power. Part V. The optical rotatory powers of methylated lactones derived from the simple sugars." By W. N. HAWORTH, E. L. HIRST, and J. A. B. SMITH.

"The ternary system zinc oxide–zinc chloride–water. (Remarks on the paper by H. C. Holland.)" By W. FEITKNECHT.

"Quinoline compounds containing arsenic. Part II. Synthesis of 6-methoxyquinoline derivatives of aminophenylarsinic acids by the use of 4-bromo-6-methoxy-2-methylquinoline." By R. H. SLATER.

"The arsinic acids of *o*-aminophenol." By M. A. PHILLIPS.

"On the disturbance of neutrality of solutions during electrodialysis." By M. WEIZMANN and J. YOFFE.

" Researches on residual affinity and co-ordination. Part XXXII. Complex salts of bivalent silver." By G. T. MORGAN and F. H. BURSTALL.

" The vapour pressure of chlorine monoxide." By C. F. GOODEVE.

" Syntheses with ββ'-dichlorodiethyl ether. Part II. Heterocyclic compounds containing two atoms of the oxygen group in the ring. 1 : 4-Selenoxan and its derivatives." By C. S. GIBSON and J. D. A. JOHNSON.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

ABDERHALDEN, EMIL. [Editor.] Handbuch der biologischen Arbeitsmethoden. Abt. I. Chemische Methoden. Teil 2, II Hälfte, Heft v. Berlin 1930. pp. 2586 to 2878. *M.* 16. (*Recd.* 22/9/30.) From the Publishers : Herren Urban & Schwarzenberg.

ACTA UNIVERSITATIS VORONEGIENSIS. Vol. II, etc. Voroneff 1925 +. (*Reference.*) From the University.

BARGER, GEORGE. Some applications of organic chemistry to biology and medicine. New York 1930. pp. viii + 186. ill. 12*s.* 6*d.* net. (*Recd.* 2/10/30.) From the Author.

BRIGGS, WILLIAM, and STEWART, ROBERT WALLACE. Qualitative analysis. 2nd edition. Revised by DOUGLAS ROSEBERY SNELLGROVE. London 1930. pp. xii + 171. ill. 4*s.* net. (*Recd.* 1/7/30.) From the University Tutorial Press.

BRISSON, [MATHURIN JACQUES]. Dictionnaire raisonné de physique. 3 vols. Paris 1781. pp. xvi + 708, iv + 770, vi + 90 plates. (*Reference.*) From Mr. J. A. Audley.

—— Observations sur les nouvelles découvertes aërostatiques, et sur la probabilité de pouvoir diriger les ballons. Paris 1784. pp. ii + 34. (*Reference.*) [Bound as supplement to " Dictionnaire raisonné de physique," Vol. 2.]

DELANGE, RAYMOND. Essences naturelles et parfums. Paris 1930. pp. 222. 10 *fr.* 50. (*Recd.* 23/6/30.) From the Publishers : Librairie Armand Colin.

ÉTUDES CHIMIQUES sous forme de dictionnaire. MS. 2 vols. [n.d.] pp. [234, 255.] ill. (*Reference.*) From Mr. J. A. Audley.

ÉTUDES METALLURGIQUES. MS. [n.d.] pp. 87. (*Reference.*) From Mr. J. A. Audley.

GODLEWSKI, EMILE. Oeuvres. Vol. I. (1870–1890.) Edited by LADISLAS VORBRODT, Cracovie 1930. pp. viii + 599. ill. (*Recd.* 15/10/30.) From the Académie Polonaise.

HALDANE, JOHN BURDON SANDERSON. Enzymes. (Monographs on Biochemistry.) London 1930. pp. viii + 235. ill. 14*s*. net. (*Recd.* 7/10/30.)

From the Publishers : Messrs. Longmans, Green & Co.

HALDANE, JOHN SCOTT. The theory of heat-engines including the action of muscles. Edinburgh 1930. pp. xvi + 120. 6*s*. net. (*Recd.* 18/8/30.) From the Publishers : Messrs. Oliver & Boyd.

HUNTRESS, ERNEST HAMLIN. A brief introduction to the use of Beilstein's Handbuch der organischen Chemie. New York 1930. pp. viii + 35. (*Reference.*) 5*s*. net.

From the London Publishers : Messrs. Chapman & Hall.

IMPERIAL COLLEGE CHEMICAL SOCIETY. Journal. Vols. VI–IX. London 1927–30. (*Reference.*) From the Society.

INSTITUT DU PIN. Bulletin. Sous le controle de l'Institut des Recherches agronomiques et rattaché à la Faculté des Sciences de Bordeaux. 2nd Series. No. 1, etc. Bordeaux 1930 +. (*Reference.*)

From the Institute.

KEIJO IMPERIAL UNIVERSITY. Acta Medicinalia in Keijo. Vols. XI and XII. Keijo 1928–29.

Continued as :—

—— Keijo Journal of Medicine. Vol. I, etc. Keijo 1930 +. (*Reference.*) From the University.

KRAFFT, CARL F. Spirazines : a type of chemical structure bearing upon the constitution of proteins and the cause of life. Washington 1930. pp. 54. ill. $1 net. (*Recd.* 16/10/30.)

From the Author.

LATVIJAS ŪNIVERSITĀTES RAKSTI. Kīmijas Fakultātes Serija. Vol. I, etc. Riga 1929 +. (*Reference.*)

From Professor Dr. A. Petrikaln.

MACQUER, [PIERRE JOSEPH.] Dictionnaire de chimie. 2nd edition. [4to]. 2 vols. Paris 1778. pp. lii + 687, iv + 856. ill. (*Reference.*) From Mr. John Pennell.

MENSCHUTKIN, BORIS NIKOLAEVITSCH. Course of general (inorganic) chemistry. 3rd edition. Moscow 1930. pp. 642. ill. [In Russian.] (*Recd.* 18/8/30.) From the Author.

PINE INSTITUTE OF AMERICA. Abstracts. Chemical Section. Vol. IV, No. 7, etc. Pittsburgh 1930 +. (*Reference.*) [In mimeograph form.] From Dr. Henry de Laszlo.

RUBBER INFORMATION. A compendium of the rubber industry in all its branches. Edited by HARRY BRENNAN CRONSHAW. London 1930. pp. 237. (*Reference.*) 10*s*. net.

From the Publishers : Messrs. Leonard Hill.

STATE COLLEGE OF WASHINGTON. Research Studies. Vol. I, etc. Pullman, Washington 1929 +. (*Reference.*) From the Editor.

STEPHENSON, MARJORY. Bacterial metabolism. (Monographs on Biochemistry.) London 1930. pp. xii + 320. ill. 18*s.* net. (*Recd.* 7/10/30.)

From the Publishers : Messrs. Longmans, Green & Co.

SYDNEY, UNIVERSITY OF. Journal of the Cancer Research Committee. Vol. I, etc. Sydney 1929 +. (*Reference.*)

From the Editor.

TAUSSIG, RUDOLF. Die Industrie des Kalziumkarbides. (Monograph. angew. Electrochem. Vol. 51.) Halle (Saale) 1930. pp. xvi + 519. ill. *M.* 60. (*Recd.* 14/10/30.)

From the Publisher : Herr Wilhelm Knapp.

THOMS, HERMANN. [Editor.] Handbuch der praktischen und wissenschaftlichen Pharmazie. Vol. V, part vi. Berlin 1930. pp. 1173 to 1348. ill. *M.* 10. (*Recd.* 14/10/30.)

From the Publishers : Herren Urban & Schwarzenberg.

TOKYO BUNRIKA DAIGAKU. Science Reports. Section A. Vol. I, etc. Tokyo 1930 +. (*Reference.*) From the Editor.

UKRAINIAN COUNCIL SOCIALIST REPUBLIC. Scientific Magazine of the Chemical Cathedar of Katerynoslaw. Ukraine 1926. (*Reference.*) From the Editor.

II. *By Purchase.*

BARCHUSEN, JOHANN CONRAD. Elementa Chemiæ, quibus subjuncta est Confectura Lapidis Philosophici. Lugduni Batavorum 1718. pp. [xii] + 532 + [19]. ill. (*Reference.*)

CURTIS, C. A. Artificial pigments and their applications. Translated by ERNEST FYLEMAN. London 1930. pp. viii + 291. 21*s.* net. (*Recd.* 16/10/30.)

EDER, JOSEF MARIA. Ausführliches Handbuch der Photographie. 6th edition. Vol. III. Part i. Die Fabrikation der photographischen Platten, Filme und Papiere und ihrer maschinelle Verarbeitung. By FRITZ WENTZEL. Halle (Saale) 1930. pp. xx + 595. ill. *M.* 48.50. (*Recd.* 6/10/30.)

EDWARDS, JUNIUS DAVID, FRARY, FRANCIS C., and JEFFRIES, ZAY. The aluminium industry. 2 vols. (Chemical Engineering Series). New York 1930. pp. xviii + 870, xii + 358. ill. 60*s.* net. (*Recd.*16/10/30.)

FULMER, ELLIS I., and WERKMAN, C. H. An index to the chemical action of microorganisms on the non-nitrogenous organic compounds. [Springfield, Ill.] 1930. pp. xiv + 198. (*Reference.*) 20*s.* net.

HERZ, WALTER. Physikalische Chemie als Grundlage der analytischen Chemie. 3rd edition. In collaboration with L. LORENZ. (Die chemische Analyse, Vol. III.) Stuttgart 1930. pp. viii + 310. ill. (*Reference.*) *M.* 19.

KRUYT, HUGO RUDOLPH. Colloids : a textbook. Translated by HENRY S. VAN KLOOSTER. 2nd edition. New York 1930. pp. xiv + 286. ill. 17*s*. 6*d*. net. (*Recd*. 16/10/30.)

PAYMAN, WILLIAM, and STATHAM, IRA CECIL FRANK. Mine atmospheres. London 1930. pp. xii + 336. ill. 10*s*. 6*d*. net. (*Recd*. 16/10/30.)

POUCHER, WILLIAM ARTHUR. Perfumes, cosmetics and soaps with especial reference to synthetics. 3rd edition. Vol. I. London 1930. pp. x + 394. ill. 21*s*. net. (*Recd*. 19/8/30.)

PREGL, FRITZ. Quantitative organic microanalysis. 2nd English edition. Translated by ERNEST FYLEMAN. London 1930. pp. xiv + 237. ill. 15*s*. net. (*Recd*. 16/10/30.)

SCHÄFFNER, ANTON. Enzyme und ihre Bedeutung zur Konstitutionsermittlung von Naturstoffen. (Fortschritte der Chemie, Physik und physikalischen Chemie. Vol. XX.) Berlin 1930.

SOMMERFELD, ARNOLD. Wave-mechanics. Translated by HENRY L. BROSE. Supplementary volume to " Atomic structure and spectral lines." London 1930. pp. xii + 304. ill. 21*s*. net. (*Recd*. 16/10/30.)

THAYSEN, AAGE CHRISTIAN, and GALLOWAY, L. D. The microbiology of starch and sugars. London 1930. pp. viii + 336. 25*s*. net. (*Recd*. 16/10/30.)

TREADWELL, FREDERICK PEARSON. Analytical chemistry. 7th English edition. Vol. I. Qualitative analysis. Translated and revised by WILLIAM THOMAS HALL. New York 1930. pp. x + 610. ill. 23*s*. net. (*Recd*. 22/9/30.)

WEBEL, A. A German-English technical and scientific dictionary. London 1930. pp. xii + 887. (*Reference*.) 36*s*. net.

ZWORYKIN, V. K., and WILSON, E. D. Photocells and their application. New York 1930. pp. xii + 209. ill. 12*s*. 6*d*. net. (*Recd*. 16/10/30.)

III. *Pamphlets*.

AUSTRALIA, COMMONWEALTH OF. *Council for Scientific and Industrial Research*. Bulletin No. 44. Investigations on " spotted wilt " of tomatoes. By GEOFFREY SAMUEL, J. G. BALD, and H. A. PITTMAN. Melbourne 1930. pp. 64. ill.

BATAVIA. *Proefstation voor Rubber*. Mededeelingen. No. 57. Enquete over de ondernemingsrubber in Java en Zuid-Sumatra. By R. RIEBL. Batavia 1930. pp. 28. ill. [In Dutch. English summary.]

BRAHMACHARI, UPENDRA NATH, and GUPTA, JNANENDRA MOHAN DAS. A contribution to the chemistry of certain new aromatic antimonials. (From the *J. Proc. Asiatic Soc. Bengal*, 1929, **25**.)

COSTA, NORBERTO P. Algunas observaciones relativas a la constitución de cementos. (From the *An. Soc. Cientifica Argentina*, 1930, **109**.). ill.

DAVIES, JAMES. Newfoundland cod liver oil. St. John's 1930. pp. 30. ill.

DEAN, WALTER A. The nickel iron chromium system. (*Rensselaer Polytechnic Inst., Eng. Sci. Series*, No. 26.) 1930.

DERRIEN, EUGÈNE. Zinc, porphyrines et cancer. (From the *Arch. Soc. Sci. Med. Biol. Montpellier*, 1929–30, **11**.)

DERRIEN, EUGÈNE, and CRISTOL, PAUL. Zincoporphyrinurie. (From the *Arch. Soc. Sci. Med. Biol. Montpellier*, 1929–30, **11**.)

EMPIRE MARKETING BOARD. May 1929 to May 1930, etc. London 1930 +.

EVANS, W. P. Microstructure of New Zealand lignites. (From the *New Zealand J. Sci. Tech.*, 1930, **11**.) ill.

GRAAF, HENDRIK DE. Verband tusschen smaak en constitutie van dicarbonzuur-dihydraziden en derivaten. Leiden 1930. pp. xii + 138.

HESS, WENDELL FREDERICK. A study of the colour sensitiveness of various types of photo-electric cells. (*Rensselaer Poly. Inst. Eng. Sci. Series*, No. 23.) Troy 1929. pp. 27. ill.

HIRAIDZUMI, TEIKICHI. Studies in menthones. (From the anniversary vol. dedicated to M. Chikashige, 1930.)

KOMATSU, SHIGERU. Biochemical studies on the bamboo. I. (From the anniversary vol. dedicated to M. Chikashige, 1930.)

KOSTING, PETER R. The nickel iron copper system. (*Rensselaer Polytechnic Inst., Eng. Sci. Series*, No. 26.) 1930.

MINES DEPARTMENT. *Safety in Mines Research Board.* Paper No. 60. Flame-proof electrical apparatus for use in coal mines. Summarising report by IRA CECIL FRANK STATHAM and RICHARD VERNON WHEELER. London 1930. pp. iv + 62. ill.

MINISTRY OF HEALTH. The Public Health (Preservative, &c., in Food) Regulations. (*Statutory Rules and Orders*, 1925, No. 775, as amended by 1926, No. 1557, and 1927, No. 577.) pp. 11.

MONIER-WILLIAMS, GORDON WICKHAM. A report on the determination of sucrose, lactose and invert sugar in sweetened condensed milk. (*Ministry of Health Reports on Public Health and Medical Subjects*, No. 57.) London 1930. pp. 23.

MORTON, JAMES. Dyestuffs and textiles in Britain: 1930. [Edinburgh] 1930. pp. 43.

NISHIDA, KITSUJI, and HASHIMA, HIDEO. Chemische Untersuchungen ueber das Glukomannan aus "Konjak." (From the *J. Dept. Agric., Kyushu Imp. Univ.*, 1930, **2**.) ill.

OBINATA, ICHIJI. Studies on quenching velocities. (From the *Mem. Ryojun Coll. Eng.*, 1930, **2**.) ill.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, October 30th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	Died.
Ernest Owen Courtman	June 21st, 1900.	Oct. 20th.
Frank Edwin Dickinson	Dec. 3rd, 1925.	Oct. 27th.

D. J. Ives was formally admitted a Fellow of the Chemical Society.

Forms of recommendation for Fellowship were read for the first time in favour of :

Victor Gallafent, B.Sc., A.R.C.S., 164, Leander Road, Brixton, S.W. 2.
Eric Charles Edward Hunter, B.Sc., 56, Westover Road, Wandsworth, S.W. 18.
Harold John Moss, B.Sc., 181, Church Road, Willesden, N.W. 10.
William Frank Pavitt, A.I.C., 3, Bowerdean Street, Fulham, S.W. 6.
Reginald John William Reynolds, B.Sc., 114, King Street, Fenton, Stoke-on-Trent.
Maurice Stacey, B.Sc., Moreton, near Newport, Salop.

The following papers were read :

" Stereochemical influences on aromatic substitution. Substitution derivatives of 5-hydroxyhydrindene." By W. H. MILLS and I. G. NIXON.

" A general method for the preparation of thiocyanine dyes. Some simple thiocarbocyanines." By N. I. FISHER and F. M. HAMER.

" Syntheses with ββ′-dichlorodiethyl ether. Part II. Heterocyclic compounds containing two atoms of the oxygen group in the ring. 1 : 4-Selenoxan and its derivatives." By C. S. GIBSON and J. D. A. JOHNSON.

Ordinary Scientific Meeting, Thursday, November 20th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows :—

	Elected.	Died.
John Edward Purvis	June 20th, 1901.	Nov. 1st, 1930.
Fred Pilkington Sargeant	Feb. 15th, 1900.	May 20th, 1930.

The PRESIDENT announced that delegates would represent the Society for the year 1931 as follows :—

Professor C. S. Gibson, Mr. A. J. Greenaway, Dr. J. T. Hewitt, and Professor G. T. Morgan, together with the Treasurer (*ex officio*), on the Bureau of Chemical Abstracts.

Professor C. S. Gibson, Sir William J. Pope, and Professor J. F. Thorpe on the Federal Council for Chemistry.

Professor A. J. Allmand, Professor F. G. Donnan, and Professor J. Kendall on the Editorial Board of the *Journal of Physical Chemistry*.

Forms of Recommendation for Fellowship were read for the first time in favour of :—

Herbert William Ashton, B.Sc., 37, Caversham Avenue, Palmers Green, N. 13.
John Beach Fleuret, 47, Walsingham Road, Hove, Sussex.
Paul Edward Gagnon, B.A., D.-ès-Sc., Laval University, Quebec.
Herbert Victor Hoffman, B.Sc., 72, Wembley Park Drive, Wembley Park.
Harry Herman Kretchmar, B.Sc., 5, Smith Street, Perth, Western Australia.
Kuruvila Ittyerah Kuriyan, B.A., M.Sc., 112, Gower Street, W.C. 1.
Harold Leslie Langdon, B.Sc., Alleyn, Hopcott, Minehead, Somerset.
Arthur Reginald Lowe, B.Sc., A.R.C.S., 7, Kempsford Gardens, Earls Court, S.W. 5.
Roland Rusk McLaughlin, M.A.Sc., M.A., Ph.D., 4, May Street, Toronto.
Louis Frederic Mountfort, Claverings, Montagu Road, Edmonton, N. 9.
Thomas Henry Hall Quibell, B.A., 51, Maids Causeway, Cambridge.
William Frederick Sandrock, B.Sc., 61, Buxton Road, Chingford, Essex.
Arthur Leonard Silcox, B.Sc., Eastbourne, Langland Bay, Mumbles, Swansea.
James Clare Speakman, M.Sc., Ph.D., St. Aidan's Vicarage, Park, Sheffield.
James Walker, B.Sc., 3, Walker Place, Arbroath, Angus.
George Stafford Whitby, M.Sc., Ph.D., 226, Rideau Terrace, Ottawa, Ont., Canada.
James Matson Wright, B.Sc., c/o Mrs. Barnfather, 7, Kempsford Gardens, Earls Court, S.W. 5.

The following papers were read :—

"Piperitone. Part XI. Syntheses of optically inactive and active piperitylamines, piperitols, and α-phellandrenes." By J. READ and R. A. STOREY.

" Researches in the menthone series. Part IX. A new optical resolution of *dl*-menthol and of *dl*-camphor-10-sulphonic acid." By J. READ and W. J. GRUBB.

" Heterocyclic systems containing selenium. Part IV. *cyclo*-Selenohexane." By G. T. MORGAN and F. H. BURSTALL.

" Bis-*p*-phenetyl telluride and its derivatives." By G. T. MORGAN and F. H. BURSTALL.

" Researches on residual affinity and co-ordination. Part XXXII. Complex salts of bivalent silver." By G. T. MORGAN and F. H. BURSTALL.

THIRD LIVERSIDGE LECTURE.

The Third Liversidge Lecture, entitled " Fifty Years' Experimental Research upon the Influence of Steam on the Combustion of Carbonic Oxide (1880–1930)," will be delivered by Professor W. A. Bone, D.Sc., F.R.S. on Thursday, December 11th, 1930, at 5.30 p.m. in the main Chemical Lecture Theatre of the Imperial College of Science and Technology, S. Kensington, S.W. 7 (by courtesy of the Governors).

THE LIBRARY.

The Library will be closed for the Christmas Holidays from Tuesday, December 23rd, at 1 p.m., until Monday, December 29th, at 10 a.m.

ANNUAL REPORTS, VOL. XXVII.

The price of the Annual Reports for 1930, Vol. XXVII, will be 5*s*. 6*d*. to those Fellows who apply before December 31st, 1930.

Application should be made to the Assistant Secretary, and must be accompanied by a remittance.

List of Papers, or Abstracts thereof, received between October 23rd and November 20th, 1930. (This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting, or which have appeared in the Journal.)

" Formation of sulphonium chlorides and of unsaturated substances by the action of water and of aqueous alcoholic potash on ββ′-dichlorodiethyl sulphide." By A. E. OXFORD.

" Note on the bromination of 4-nitro-α-methylnaphthalene and the preparation of some aryl methyl halides." By J. S. H. DAVIES and A. E. OXFORD.

"The action of acids and alkalis on textile fibres. Part I. The action of acids and alkalis on cotton." By J. C. VOGEL.

"The reactions of the dioxides of selenium and tellurium with the halogen acids." By T. W. PARKER and P. L. ROBINSON.

"Note on the action of nitrous acid on thiourea." By T. W. J. TAYLOR.

"The action of halogens on ethyldi-iodostibine. Antimony bromo-di-iodide." By R. E. D. CLARK.

"The polysulphides of barium and calcium." By P. L. ROBINSON and W. E. SCOTT.

"The formation of aromatic thiosulphonic acids from disulphides." By E. W. MCCLELLAND and L. A. WARREN.

"Syntheses of glucosides. Part VI. The preparation of β-glucosides of phenols." By A. ROBERTSON and R. B. WATERS.

"Reaction of *p*-anisidine and ethyl methylacetoacetate." By W. O. KERMACK and J. F. SMITH.

"The interaction of ammonium sulphite with certain polybromo-paraffins." By W. J. POPE and F. B. KIPPING.

"The action of molecular nitrogen on highly purified iron." By H. H. GRAY and M. B. THOMPSON.

"Properties of conjugated compounds. Part XI. Addition of hydrogen bromide to βγ- and αδ-dimethylbutadiene." By E. H. FARMER and F. C. B. MARSHALL.

"ω-Cyano-acylamines and their transformation to quinoline derivatives." By M. ISHAQ and J. N. RÂY.

"The dissociation pressures of the iron nitrides." By H. H. GRAY.

"The hydrolysis of acetamide." By T. W. J. TAYLOR.

"A study of the aliphatic ethers." By H. HENSTOCK.

"The action of substituted aromatic amines on camphoric anhydride. The rotatory power of some disubstituted camphoranilic acids." By M. SINGH and D. SINGH.

"Chlorination of *o*- and *p*-nitrotoluenes. 3 : 4 : 6-Trichloro-2-nitrotoluene and 2 : 6-dichloro-4-nitrotoluene." By L. F. LEVY and H. STEPHEN.

"A new method of reducing aromatic nitro-compounds." By (Miss) T. E. DE KIEWIET and H. STEPHEN.

"The preparation of 4-nitrophthalimide and some of its derivatives." By L. F. LEVY and H. STEPHEN.

"Note on the preparation of anhydrous chlorides." By H. STEPHEN.

"Note on 6-chloro-2-methylbenzoic acid and its conversion into 6-chloro-α-hydroxyphthalide." By L. F. LEVY and H. STEPHEN.

"The co-ordination compounds of oximes. Part II. Nickel and cobalt compounds of *o*-hydroxybenzaldoxime." By O. L. BRADY.

"Syntheses of glucosides. Part VII. The synthesis of 6-bromo-indican." By A. ROBERTSON and R. B. WATERS.

"The inhibition of chemical reactions. Part IV. The site of anti-oxygenic action. The oxidation of sodium sulphite." By K. C. BAILEY and (MISS) V. H. FFRENCH.

"The action of nitric acid on polycyclic indole derivatives. Part IX." By S. A. BRYANT and S. G. P. PLANT.

"New derivatives of pyrrole. Part I. The synthesis of 3-keto-4 : 5-dihydro-di-(1 : 2)-pyrrole, and of 8-keto-5 : 6 : 7 : 8-tetra-hydropyrrocoline." By G. R. CLEMO and G. R. RAMAGE.

"The formation of kojic acid from sugars by *Aspergillus oryzæ*." By F. CHALLENGER, L. KLEIN, and T. K. WALKER.

"Reduction products of the hydroxyanthraquinones. Part XII." By G. F. ATTREE and A. G. PERKIN.

"Nitrogen tri-iodide." By H. W. CREMER and D. R. DUNCAN.

FORMS OF RECOMMENDATION FOR FELLOWSHIP. THE BALLOT WILL BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, DECEMBER 4th, 1930.

ANGELL, FREDERICK GEORGE, 32, Pinner Road, Harrow, Middlesex. British. Chemist. B.Sc., 2nd Class Hons. in Chemistry, Birmingham, 1928. Undertook research on chemistry of co-ordination compounds, 1928–1930, under direction of Dr. W. Wardlaw. "Complex Bromides of Quinquevalent Molybdenum," *J.C.S.*, 1929, 2578. "A New Interpretation of the Isomerism amongst Co-ordination Compounds of Platinum," *ibid.*, 1930, 349. (*Signed by*) W. N. Haworth, Harry W. Webb, F. W. Pinkard, H. D. K. Drew, Wm. Wardlaw.

BALDWIN, ALFRED WILLIAM, 100, Cecile Park, Crouch End, N. 8. British. Organic Chemistry Research Student. B.Sc., 2nd Class Hons. Chemistry (London External). Private study. Ph.D. (London External), Manchester University and University College, London. Employed as assistant, B. D. C. Blackley, 1918–26. Post-graduate research on nitration of sulphones and antimalarial research, viz. preparation of aminoalkylamino-6-alkoxyquinolines. "Attempts to Find New Antimalarials," Part III, *J.C.S.*, 1929, 2959. (*Signed by*) R. Robinson, R. J. W. Le Fèvre, W. Bradley.

BATTEN, WILLIAM EDWARD, 41, Calais Gate, Myatts Park, S.E. 5. British. Research Student. Associate of the Royal College of Science. At present carrying out research in organic chemistry at Imperial College of Science and Technology. (*Signed by*) Jocelyn Thorpe, M. A. Whiteley, G. A. R. Kon, R. P. Linstead.

BEATTIE, WILLIAM ANDREW, 11, Fraser Grove, Wardie, Edinburgh. British. Chemist and Druggist. Member of the Pharmaceutical Society.

Laboratory Manager, Messrs. Duncan, Flockhart & Co., 104, Holyrood Road, Edinburgh. (*Signed by*) J. J. Blackie, Eric Knott, Gordon Perrins.

BECKETT, ERNEST GEORGE, Gilmerton, Larbert, Stirlingshire. British. Works Manager (Scottish Dyes, Ltd., Grangemouth). Dipl. Chem. (Zürich); Ph.D. (Zürich); F.I.C. Research on determination of antimony (thesis). "The Estimation of Nitrogen in Nitrocellulose and Inorganic Nitrates," *J.C.S.*, 1920, 220. (*Signed by*) John Read, W. D. Rogers, Wm. Rintoul, Wm. Barbour.

BLACK, HUGH KENNETH, 63, Middle Street, Brighton, Sussex. British. Technical Assistant. B.Sc., Special London. (*Signed by*) Allan Domleo, J. C. Everett, A. J. Butterworth.

BLOOMFIELD, GEORGE FREDERIC, 27 Belmont Avenue, Tottenham, N. 17. British. Research Student, Organic Chemistry, Royal College of Science. B.Sc. (London); A.R.C.S. (1st Class Hons.). (*Signed by*) Jocelyn Thorpe, G. A. R. Kon, E. H. Farmer.

BRADLEY, JOHN, 25, Lamel Street, Hull Road, York. British. From Sept. 1, 1930, Science Master at Wallasey Grammar School. B.A., Cambridge (2nd Class Hons. Chemistry); B.Sc., London (1st Class Hons. Chemistry). (*Signed by*) Gordon Van Praagh, J. G. A. Griffiths, H. Worth.

CHAKRAVARTI, DHIRENDRA NATH, King Edward College, Amraoti (Berar), India. Hindu. Demonstrator in Chemistry. M.Sc. (Allahabad University), 1925. Three years' teaching experience. Published papers: (1) "Fluorescence and Chemical Change," *Zeit. anorg. Chem.*, 1925, **142**, 299; (2) "Viscosity of Some Sols in Presence of Potassium Chloride," *ibid.*, 1926, **152**, 393; (3) "Formation of Gels of Vanadium Pentoxide and Stannic Hydroxide Sol," *ibid.*, 1926, **152**, 399; (4) "Viscosity and Gel Formation of Ceric Hydroxide Sol," *ibid.*, 1927, **164**, 63; (5) "Change of Viscosity and Electrical Conductivity of Sols on Ageing and the Formation of Gels of Inorganic Substances," *ibid.*, 1927, **168**, 209; (6) "Ageing Phenomena in Viscosity and Conductivity of some Sols and Electrolytes," *Koll. Zeit.*, 1927, **42**, 120; (7) "Viscosity of some Hydrophobic Sols and the Effect of Addition of Electrolytes," *ibid.*, 1927, **42**, 124; (8) "Viscosity of Colloids in Presence of Electrolytes," *ibid.*, 1928, **44**, 225; (9) "Viscosity Measurements of some Sols in Presence of Electrolytes," *Jour. Phys. Chem.*, 1926, **30**, 1646; (10) "Adsorption of Ions by Sols of Aluminium Hydroxide and Vanadium Pentoxide Sol," *Journ. Ind. Chem. Soc.*, 1928, **5**, 539. (*Signed by*) N. R. Dhar, S. N. Godbole, R. N. Kayasth.

CHANDRA, MONMOHAN, Senior Master, Government High School, Ma-ubin, Lower Burma. Bengalee. B.Sc., with distinction, of Calcutta University. Higher Grade Teachers' Certificate from Burma. 1. "A Knowledge of Chemistry for Housewives useful in Domestic Affairs" (in Bengali, not yet published). 2. "An Improved Method of Extracting Petroleum from Crude Oil" (not yet published). 3. Late Assistant Chemist of the British Burma Petroleum Company, Burma. (*Signed by*) G. C. Moitra, J. R. Sanyal, Maung Ba San.

CLAPHAM, FREDERICK CHARLES, 90, The Portway, West Ham, E. 15. British. Accountant (Public Practice). Desire to receive publications, attend meetings, and use library. (*Signed by*) Evan D. Griffiths, T. S. Moore, C. S. Gibson.

COX, ERNEST GORDON, 352, Shirley Road, Acocks Green, Birmingham. British. Assistant Lecturer in Chemistry. B.Sc. (Bristol). Assistant to the Professor of Chemistry, Royal Institution, 1927–29. Assistant Lecturer

in Chemistry, University of Birmingham, 1929 to date. (*Signed by*) W. N. Haworth, S. R. Carter, Wm. Wardlaw, F. W. Pinkard.

CROWTHER, HAROLD ALBERT HADLEIGH, "Claremont," Cedar Road, Croydon, Surrey. English. Manufacturing Chemist. Student, College of Pharmacy of Wales. Chief Chemist, E. C. De Witt & Co., Ltd. Chief Chemist, Di-Miska Laboratories (Warren Pharmacal Co., Ltd.). (*Signed by*) F. C. Dyche-Teague, Ernest A. Rudge, Harold Heron.

FOX, ARTHUR LAWRENCE, 1103, Blackshire Road, Wilmington, Delaware, United States. American. Chemist. B.A., M.S. University of Illinois, 1923; Ph.D., North-western University, 1927. *J. Amer. Chem. Soc.*, **51**, 3363. Chemist in Dyestuff Research, Du Pont Company. (*Signed by*) James Craik, Leon Rubenstein, F. D. Miles.

FREUNDLICH, HERBERT, Enzianstrasse 3, Berlin—Lichterfelde. German. Member of the Kaiser Wilhelm Institute for Physical and Electrochemistry. University Professor. Ph.D. (Leipzig). Author of "Kapillarchemie." Liversidge Lecture, 1929. (*Signed by*) Jocelyn Thorpe, F. G. Donnan, T. Slater Price, George Barger, T. S. Moore, C. S. Gibson.

GALLAFENT, VICTOR, 164, Leander Road, Brixton, S.W. 2. English. Student. B.Sc., A.R.C.S. (Royal College of Science, London). (*Signed by*) H. F. Harwood, H. L. Riley, James C. Philip.

GIDVANI, BHAWAN SHOWKIRAM, c/o American Express Co., 6, Haymarket, S.W. 1. Indian (British subject). Student. B.Sc. in Chemistry and Physics of the Bombay University. Research work on complex nitrites of potassium and lead for one year under Dr. A. N. Meldrum, and now a research student in organic chemistry at the Imperial College of Science and Technology under Prof. J. F. Thorpe. (*Signed by*) G. A. R. Kon, Arnold Stevenson, R. P. Linstead.

GLASSMAN, JOSEPH, 108, Goldsmith's Row, Hackney, E. 2. English. Research Student in Physical Chemistry. 1st Class Hons., B.Sc., London. (*Signed by*) J. R. Partington, W. H. Patterson, D. C. Jones, R. J. Winterton.

GOEPP, RUDOLPH MAXIMILIAN, jun., Queen's College, Oxford, England. American. Student. B.S. in Chemistry, Lehigh University, Bethlehem, Pa., U.S.A. Rhodes Scholar. (*Signed by*) F. D. Chattaway, G. D. Parkes, S. G. P. Plant, D. Ll. Hammick.

GOW, EVELYN REID LINDSAY, 31, Windsor Street, Dundee. British. Carnegie Research Scholar. B.Sc. (St. Andrews) with Hons. of 1st Class in Chemistry. (*Signed by*) Alex. McKenzie, Isobel A. Smith, Pat D. Ritchie, Agnes G. Mitchell.

HAMBLY, ARTHUR NEVILLE, 15, Moubray Street, Albert Park, S.C. 6, Melbourne, Australia. British. Student. Undergraduate. Student doing final year for B.Sc. Honours in chemistry in training for teaching of chemistry. (*Signed by*) E. J. Hartung, W. Davies, K. N. Welch, W. J. Young.

HAMPSHIRE, FREDERICK WILLIAM, Overstrand Lodge, Overstrand, Norfolk. British. Managing Director of F. W. Hampshire & Co., Ltd., Manufacturing Chemists, Derby. The applicant has built up the business of F. W. H. & Co., Ltd., from its inception, and has until recently been in charge of the experimental and research work in connection with our business. (*Signed by*) Howard A. Costigan, W. W. Reed, John W. Corran, George P. Forrester.

HARRIS, THOMAS LANE, 5, Hawthorne Road, King's Norton, Birmingham. British. Research Chemist. B.Sc., 1st Class Hons. (Birmingham). Re-

search student at Birmingham University. (*Signed by*) Chas. E. Wood, H. D. K. Drew, E. L. Hirst, W. N. Haworth.

HARRY, RALPH GORDON, 183, Cathedral Road, Cardiff. British. Student. I have qualified as a Student-member of the Institute of Chemistry, and am studying for my F.I.C. I have spent two years at the Technical College and obtained my First Year Joint Diploma in Chemistry, and since then have spent a year in practical work at the Cardiff Laboratories under the City and County Analysts. (*Signed by*) Ernest A. Rudge, H. B. Watson, Thomas Graham.

HEALEY, MARGARET MARY, 79, Pope's Avenue, Twickenham. British. Chemistry Research Student. B.Sc., Special, London. (*Signed by*) C. K. Ingold, A. M. Robinson, R. J. W. Le Fèvre.

HICKS, ROBERT HAXWELL, 65, Romilly Road, Cardiff. British. Analytical Chemist. Inter. B.Sc. (Wales); B.Sc. (Wales) with the exception of one subject (physics). Three and a half years as a student in the University College of South Wales and Monmouthshire. Seven years' experience as an Analytical Chemist with Messrs. Treharne and Duncan, Analytical and Consulting Chemists, 125, Bute Street, Cardiff. (*Signed by*) J. H. Duncan, W. J. Jones, W. Cule Davies, S. T. Bowden.

HILL, DOUGLAS WILLIAM, 33, Dunlop Avenue, Lenton, Nottingham. British. Research Chemist. B.Sc. (Bristol); Ph.D. (Liverpool). Assistant to Professor Heilbron, D.S.O., Liverpool University, 1926–27. Research chemist to Messrs. Boots Pure Drug Co., Ltd., 1927–present. *J.C.S.*, 1927, 1705, 2005; 1928, 993; 1929, 2236. (*Signed by*) Frank Lee Pyman, Reginald Child, Reginald C. Fawcett.

HOSE, CYRIL GUSTAV BIDWELL, 36, Vartry Road, Stamford Hill, N. 15. British. Student. A.R.C.S. (London). Student engaged in research work in organic chemistry at Royal College of Science. (*Signed by*) E. H. Farmer, M. A. Whiteley, H. J. T. Ellingham.

HUNTER, ERIC CHARLES EDWARD, 28, Alfred Street, Swindon, Wilts. English. Research Student. B.Sc. (1st Class) Chemistry, London. I wish to attend the meetings of the Society and to contribute papers to the Journal concerning my research work. (*Signed by*) J. R. Partington, D. C. Jones, W. H. Patterson, R. J. Winterton.

JEFFERY, GEORGE HAROLD, "Redbourne," Lordswood Avenue, Bassett, Southampton. English. Demonstrator, Chemistry Department, University College, Southampton. B.Sc. (Special) (London). Research student. (*Signed by*) D. R. Boyd, A. I. Vogel, H. H. Hatt.

KOBAYASHI, MATSUSUKE, Chemical Institute, Faculty of Science, Tohoku Imperial University, Sendai, Japan. Japanese. Professor of Analytical Chemistry. D.Sc. (Sendai). Sakurai medallist of 1928, Chemical Society of Japan. Author and joint author (with F. A. Gooch and G. P. Baxter) of papers published in *J. Chem. Soc. Japan, Amer. Journ. of Science*, and *J. Amer. Chem. Soc.* (*Signed by*) Riko Majima, Hiroshi Nomura, Sin-iti Kawai.

LETCH, RALPH ARTHUR, Ebenezer Cottage, Shenley, near Barnet, Herts. English. Research Student. A.R.C.S. (Lond.). Engaged in research in organic chemistry at the Imperial College, London. (*Signed by*) R. P. Linstead, M. A. Whiteley, H. L. Riley.

MCKAY, WILLIAM BYRES, 20, Dundee Road, Forfar, Angus. Scottish. Carnegie Research Scholar. B.Sc. (St. Andrews) with Hons. of the 1st Class in Chemistry. (*Signed by*) Alex. McKenzie, John Foggie, John D. M. Ross.

MACLENNAN, GEORGE WILLIAM GRANT, 9, Park Walk, Chelsea, S.W. 10. British. Student in Chemistry (Research). M.A., Aberdeen, 1926; B.Sc. with 1st Class Hons. in Chemistry, Aberdeen, 1929. Research experience in physical chemistry at Aberdeen, 1929–30. Subject: "Iodine Ion Concentration in Acetone-Water Mixtures." (*Signed by*) Jocelyn Thorpe, G. A. R. Kon, Arnold Stevenson.

MACNIVEN, JOHN, Lohat P.O., District Darbhanga, B. & N.W. Rly., India. British. Chemist and Sugar Technologist. Studied chemistry, fuels and their application, bacteriology and sugar manufacture at the Royal Technical College. City and Guilds of London Technological Diploma in Sugar Technology. (*Signed by*) Thomas Gray, F. J. Wilson, W. M. Cumming.

MACWALTER, ROY JAMES, "Anglesea," Maple Road, Ashtead, Surrey. British. Research in Chemistry. B.Sc., University College, London (1st Class Hons. Chemistry). Research student in chemistry at University College, London. (*Signed by*) S. Barratt, H. de Laszlo, Henry Terrey.

MALHOTRA, KISHEN LAL, 52, Claremont Road, Highgate, N. 6. Aryan. Lecturer in Chemistry, Government College, Lahore. M.Sc. (Physics); M.Sc. (Chemistry), Panjab (India). Author of: (1) "Determination of Free Mercury in Commercial Products," *The Analyst*, June 1927; (2) "Solubility of Mercuric Bromide in Ethyl and Methyl Alcohols," *J. Ind. Chem. Soc.*, 1928; (3) "Action of Substituted Aromatic Amines on Camphoric Anhydride, etc.," *J.C.S.*, Sept. 1928; (4) "Action of Bromine on Strontium Oxide and its Hydrates," *ibid.*, Dec. 1928. (Joint author of (2), (3), and (4).) (*Signed by*) C. K. Ingold, C. F. Goodeve, F. G. Donnan.

MOSS, HAROLD JOHN, 181, Church Road, Willesden, N.W. 10. English. Student. B.Sc. (Hons. Chemistry, London). Research student in physical chemistry at East London College. (*Signed by*) J. R. Partington, D. C. Jones, W. H. Patterson.

NOBLE, ERNEST GILBERT, 22, Dartmouth Park Road, Highgate Road, N.W. 5. British. Research Student. A.R.C.S. (Lond.). At present engaged in research in organic chemistry at the Imperial College. (*Signed by*) G. A. R. Kon, M. A. Whiteley, R. P. Linstead.

PARRY, THOMAS JOHN VERNON, 349, Buxton Road, Great Moor, Stockport. British. Chemist. Member Pharmaceutical Society, London; M.I.C.O., London. Now Managing Director of Phenyldent Proprietaries, Ltd., Manufacturing Chemists. Founder and inventor of Phenyldent Antiseptics. On research at present on digitalis, re chemical standardisation and stability. Desiring to be elected a Fellow, to get in touch with present-day researches, which I am convinced would be a great asset to my own analysis. (*Signed by*) Perry Barrs, John J. Laws, Harry Lucas.

PAVITT, WILLIAM FRANK, 3, Bowerdean Street, Fulham, S.W. 6. English. Works Chemist, Burgoyne, Burbidges & Co., Ltd. A.I.C. (London). Engaged in manufacture of fine organic chemicals. (*Signed by*) J. N. E. Day, O. L. Brady, Henry Terrey.

REYNOLDS, REGINALD JOHN WILLIAM, 114, King Street, Fenton, Stoke-on-Trent. British. Research Student. Hons. B.Sc. (Birmingham). I desire to keep in touch with present-day developments in chemistry. Technical Assistant and Micro. Analyst, Chemical Department, University of Birmingham. (*Signed by*) W. N. Haworth, E. L. Hirst, Allan C. Waine.

RHODES, CLIFFORD ARTHUR, Dorcliffe, 38, Granny Lane, Mirfield, Yorkshire. British. Assistant Chemist on Manufacturing Staff of British Dye-

stuffs Corporation, Ltd. B.Sc. (Special Chemistry Ext.), University of London, 1930. Teacher of Chemistry, Batley Technical College (Evening Course). Engaged in the manufacture of dyestuffs and dyestuffs intermediates since 1920. (*Signed by*) F. W. Richardson, James C. Harral, James **Bruce.**

ROBINSON, ANTHONY MELLAND, The Châlet, Lindfield, Sussex. British. Works Chemist. B.A., Cambridge. 2nd Class in Chemistry in Part II Natural Sciences Tripos, 1930. Wishing to keep in touch with modern advances in chemistry. (*Signed by*) W. H. Mills, Eric K. Rideal, F. G. **Mann.**

SHAH, CHANDULAL CHHOTALAL, East London College, Mile End Road, E. 1. British. Research Chemist. B.Sc. (1st Class Hons. Chemistry, Bombay, 1926); M.Sc. (Bombay), 1929. Demonstrator in Chemistry, Baroda College, India. (*Signed by*) J. R. Partington, N. L. Anfilogoff, D. C. Jones.

SNOW, CHRISTINE MARY, Somerville College, Oxford. British. Research Fellow of Somerville College. B.A. in the Honours School of Natural Science, and B.Sc., Oxford. For library facilities and to receive publications. (*Signed by*) F. D. Chattaway, G. D. Parkes, Frederick M. Brewer.

STACEY, MAURICE, Moreton, near Newport, Shropshire. British. Research Student. B.Sc. (Hons.), Birmingham. Research Student and Demonstrator, Chemistry Department, University of Birmingham. I desire to keep in touch with present-day developments in chemistry. (*Signed by*) W. N. Haworth, E. L. Hirst, S. W. Challinor.

STAFFORD, GEORGE BASIL, 12, The Grove, Southey Street, Nottingham. British. The Sandoz Chemical Co. B.Sc., 1st Class Hons., London University. Manager of Springfield Starch Works, Nottingham. (*Signed by*) F. S. Kipping, E. B. R. Prideaux, J. B. Firth.

TROTTER, JOHN FREDERICK FELIX, 83, Mildred Avenue, Watford, Herts. English. Research Student. A.R.C.S., B.Sc. (London). Engaged in research at the Royal College of Science. (*Signed by*) Jocelyn Thorpe, M. A. Whiteley, R. P. Linstead.

WALDRON, EVELYN MARIE, The Cedars, Little Marlow Road, Marlow, Bucks. British. Chemistry Research Student. B.Sc., Special, London. (*Signed by*) C. K. Ingold, A. M. Robinson, R. J. W. Le Fèvre.

WATSON, ERIC MERVYN, 144, Sinclair Road, Kensington, W. 14 (postal address: c/o Agent-General for Western Australia, Savoy House, Strand). British. Post-graduate Student. B.Sc. (Hons.), University of Western Australia; A.I.C. Lecturer in Chemistry in the University of Adelaide, University of Western Australia and Perth Technical College. (*Signed by*) N. T. M. Wilsmore, Edward S. Simpson, G. A. R. Kon.

WILLIAMS, EVAN CLIFFORD, 131, Alvarado Road, Berkeley, California, U.S.A. British. Director of Research. M.Sc., Manchester; D.Sc., London. Ramsay Professor of Chemical Engineering, University of London. Director of the Shell Development Company. (*Signed by*) James W. McBain, C. S. Gibson, T. S. Moore.

YOUNG, PATRICK CHISHOLM, c/o Messrs. John Heathcoat & Co., Tiverton, Devon. British. Industrial Research Chemist. B.A., Cambridge. Part I, Modern Languages Tripos; Part II, Natural Sciences Tripos. (*Signed by*) W. J. Pope, W. H. Mills, Eric K. Rideal.

The following Forms of Recommendation for Fellowship have

been authorised by the Council for presentation to ballot under Bye-Law I (2):

CHRISTIE, JOHN, 174, Eighth Avenue, Mayfair, Johannesburg, South Africa. British. Chemist and Druggist. President of South African Pharmacy Board. Desire to receive the publications of the Society. (*Signed by*) George P. Forrester, W. Leslie Dixon.

FAWCETT, JOSEPH SPENCER, 186, Oxford Terrace, Christchurch, New Zealand. Briton. Manager, Steele Chemical Proprietary, Ltd. Eight years' teaching, Marlborough, Otago, and Auckland. Actively associated industrially. (*Signed by*) H. G. Denham, J. Packer.

HINDE, HAROLD, 135, Grey Street (P.O. Box 792), Bulawayo, Rhodesia, S.A. British. Chief Chemist, Rhodesia Railways. Chemist and Druggist (Great Britain); M.P.S. (Great Britain, 1920); M.P.S. (Rhodesia). I was in charge of Wholesale and Manufacturing Department of Wilson and Kitchins, Whitehaven, 1913–14. I have been Chemist to Rhodesia Railways since 1920. (*Signed by*) Max Rubin, N. F. Lovasz.

SULLIVAN, JOSEPH JOHN, S.J., Boston College, Chestnut Hill, Mass., U.S.A. American. Professor of Chemistry. A.B., M.A. [Woodstock (M.D.)]; Ph.D. (Johns Hopkins). (*Signed by*) W. A. Patrick.

WHITEFORD, GILBERT HAYES, 1612 S. College, Fort Collins, Colorado, U.S.A. United States. Head Department of Chemistry, Colorado Agric. College. B.S. Md. Agric. College; A.M., Columbia; Ph.D., Johns Hopkins; Professor of Chemistry, Albright College, Myerstown, Pa., 1911–15; Scholarship Johns Hopkins University, 1915–17; Associate Professor of Chemistry, Colorado Agric. College, 1917–18; Professor and Head of Department, 1918-present. (*Signed by*) G. Wakeham.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

ABDERHALDEN, EMIL. [Editor.] Handbuch der biologischen Arbeitsmethoden. Abt. I. Chemische Methoden. Teil 2, II Hälfte, Heft vii. Berlin 1930. pp. 2879 to 2970. *M.* 5. (*Recd.* 24/10/30.) From the Publishers: Herren Urban & Schwarzenberg.

BILLITER, JEAN. Die neueren Fortschritte der technischen Elektrolyse. (Ergänzungsband zum I, II, und III Teil der "Technischen Elektrochemie.") Halle (Saale) 1930. pp. viii + 328. ill. *M.* 20. (*Recd.* 1/11/30.)

From the Publisher: Herr Wilhelm Knapp.

BRIGGS, WILLIAM, and BAUSOR, HAROLD WILLIAM. Elementary quantitative analysis. 2nd edition. Revised by DOUGLAS ROSEBERY SNELLGROVE. London 1930. pp. viii + 125. ill. 3*s.* net. (*Recd.* 3/11/30.) From the Publishers: University Tutorial Press.

CARLOS, ARTHUR SIDNEY. Feeding stuffs. London 1928. pp. xii + 152. ill. 5*s.* net. (*Recd.* 23/10/30.) From the Author.

FORTSCHRITTE DER CHEMIE, PHYSIK UND PHYSIKALISCHEN CHEMIE. Neue Folge des Physikalisch-chemischen Centralblattes. Vols. I–VI. Leipzig 1909–13. (*Reference.*)

—— Generalregister. Vols. I–V. (1909–12). Leipzig 1912. (*Reference.*) From Dr. T. Slater Price, O.B.E., F.R.S.

FRÉCHET, M., and ROMANN, R. Représentation des lois empiriques par des formules approchées à l'usage des chimistes, des physiciens, des ingénieurs et des statisticiens. Paris 1930. pp. viii + 302. 35 *fr.* (*Recd.* 13/11/30.)

From the Publishers: Librairie de l'Enseignement Technique.

GWOSDZ, JOSEF. Kohlenwassergas. Entwicklung, Durchführung und Ziele der restlosen Vergasung unserer Brennstoffe auf der Grundlage des Wassergasprozesses. Halle (Saale) 1930. pp. viii + 203. ill. *M.* 18. (*Recd.* 4/11/30.)

From Mr. H. M. Spiers.

KAUSCH, OSCAR. Der Graphit. Halle (Saale) 1930. pp. viii + 247. ill. *M.* 25. (*Recd.* 4/11/30.) From Mr. H. M. Spiers.

PARSONS, THOMAS RICHARD. The materials of life. A simple presentation of the science of biochemistry. London 1930. pp. 288. ill. 10*s.* 6*d.* net. (*Recd.* 24/10/30.)

From the Publishers: Messrs. George Routledge & Sons.

PHYSICAL SOCIETY and OPTICAL SOCIETY. Photo-electric cells and their applications. A discussion at a joint meeting. London 1930. pp. 236. ill. 12*s.* 6*d.* net. (*Recd.* 7/11/30.)

From the Societies.

ROSENTHALER, LEOPOLD. The chemical investigation of plants. Authorised translation of the 3rd German edition. By SUDHAMOY GHOSH. (Monographs on Modern Chemistry.) London 1930. pp. viii + 197. ill. 12*s.* 6*d.* net. (*Recd.* 17/11/40.)

From the Publishers: Messrs. G. Bell & Sons.

SOCIÉTÉ FRANÇAISE DE PHOTOGRAPHIE. Bulletin. 3rd series. Vol. XIV, etc. Paris 1927 +. (*Reference.*)

From Dr. T. Slater Price, O.B.E., F.R.S.

WEISS, MAX. Das Trocknen der Kohle. Halle (Saale) 1930. pp. viii + 196. ill. *M.* 15. (*Recd.* 4/11/30.)

From Mr. H. M. Spiers.

II. *By Purchase.*

BARKER, THOMAS VIPOND. The study of crystals: a general introduction. London 1930. pp. xvi + 137. ill. 8*s.* 6*d.* net. (*Recd.* 20/11/30.)

BARNARD, GEORGE P. The selenium cell, its properties and applications. London 1930. pp. xxx + 331. ill. 35*s.* net. (*Recd.* 20/11/30.)

BERTELSMANN, WILHELM, and SCHUSTER, FRITZ. Einführung in die technische Behandlung gasförmiger Stoffe. Berlin 1930. pp. x + 411. ill. *M.* 40. (*Recd.* 11/11/30.)

BILTZ, HEINRICH, and BILTZ, WILHELM. Ausführung quantitativer Analysen. Leipzig 1930. pp. xvi + 402. ill. *M.* 20. (*Recd.* 11/11/30.)

BRÜCKNER, HORST. Katalytische Reaktionen in der organisch-chemischen Industrie. I. Dresden 1930. pp. viii + 168. ill. *M.* 16. (*Recd.* 11/11/30.)

CHEMICAL CATALOG COMPANY. The condensed chemical dictionary. 2nd edition. New York 1930. pp. 550. (*Reference.*) 42*s.* net.

CLERC, L. P. Photography, theory and practice: being an English edition of "La technique photographique." Edited by GEORGE EDWARD BROWN. London 1930. pp. xvi + 566. ill. 35*s.* net. (*Recd.* 20/11/30.)

CRAVERI, CALISTO. Les essences naturelles: extraction-caractères-emplois. Translated by HENRI TATU. Paris 1929. pp. xii + 602. ill. 70 *fr.* (*Recd.* 28/10/30.)

DEMING, HORACE G. In the realm of carbon. The story of organic chemistry. New York 1930. pp. x + 365. ill. 15*s.* net. (*Recd.* 20/11/30.)

DURVELLE, J. P. Fabrication des essences et des parfums. Chimie des parfums. 3rd edition. Paris 1930. pp. viii + 808. ill. 135 *fr.* (*Recd.* 30/10/30.)

EULER, HANS VON. Biokatalysatoren. (Sammlung, New Series, Vol. I.) Stuttgart 1930. pp. 68. (*Reference.*)

EVANS, CHARLES [ARTHUR] LOVATT. Recent advances in physiology. 4th edition. London 1930. pp. xii + 446. ill. 12*s.* 6*d.* net. (*Recd.* 20/10/30.)

FERCHL, FRITZ. Von Libau bis Liebig. Chemikerköpfe und -Laboratorien. Mittenwald (Bayern) [1930]. pp. [94]. ill. *M.* 7. (*Recd.* 11/11/30.)

FINDLAY, ALEXANDER. The spirit of chemistry: an introduction to chemistry for students of the liberal arts. London 1930. pp. xvi + 480. ill. 10*s.* 6*d.* net. (*Recd.* 20/10/30.)

FINDLAY, GEORGE MARSHALL. Recent advances in chemotherapy. London 1930. pp. viii + 532. ill. 15*s.* net. (*Recd.* 20/11/30.)

FREUNDLICH, HERBERT. Kapillarchemie. 4th edition. In collaboration with J. BIKERMAN. Vol. I. Leipzig 1930. pp. viii + 566. ill. *M.* 39. (*Recd.* 11/11/30.)

GOSSELIN, ALBERT, and GOSSELIN, MARCEL. Constitution et thermochimie des molécules. Paris 1930. pp. viii + 231. ill. 40 *fr.* (*Recd.* 28/10/30.)

GRANT, JULIUS. The measurement of hydrogen-ion concentration. London 1930. pp. viii + 159. ill. 9*s*. net. (*Recd.* 20/10/30.)

HARRISON, GEOFFREY ARTHUR. Chemical methods in clinical medicine. London 1930. pp. x + 534. ill. 18*s*. net. (*Recd.* 20/11/30.)

HENRICI, ARTHUR T. Molds, yeasts, and Actinomycetes. New York 1930. pp. x + 296. ill. 17*s*. 6*d*. net. (*Recd.* 20/11/30.)

JOHNSON, CHARLES MORRIS. Rapid methods for the chemical analysis of special steels, steel-making alloys, their ores, graphites, and bearing metals. New York 1930. pp. xx + 729. ill. 37*s*. 6*d*. net. (*Recd.* 20/10/30.)

KIND, W. [and others]. Der Flachs. Part I. Berlin 1930. pp. x + 427. ill. *M*. 54. (*Recd.* 11/11/30.)

KIRCHNER, JULIUS. Die Sodafabrikation nach dem Solvay-Verfahren. Leipzig 1930. pp. xii + 123. ill. *M*. 10.50. (*Recd.* 11/11/30.)

METZGER, HÉLÈNE. Newton, Stahl, Boerhaave et la doctrine chimique. Paris 1930. pp. vi + 332. 40 *fr*. (*Recd.* 28/10/30.)

MEYERHOF, OTTO. Die chemischen Vorgänge im Muskel und ihr Zusammenhang mit Arbeitsleistung und Wärmebildung. Berlin 1930. pp. xiv + 350. ill. *M*. 29.80. (*Recd.* 11/11/30.)

MITCHELL, CHARLES AINSWORTH. [Editor.] Recent advances in analytical chemistry. Vol. I. London 1930. pp. x + 421. ill. 12*s*. 6*d*. net. (*Recd.* 20/10/30.)

NONNENMACHER, E. Die Jute. Part I. Berlin 1930. pp. viii + 571. ill. *M*. 86. (*Recd.* 11/11/30.)

RUPE, HANS. Anleitung zum Experimentieren in der Vorlesung über organische Chemie. 2nd edition. Berlin 1930. pp. viii + 177. ill. *M*. 14. (*Recd.* 11/11/30.)

SMITHELLS, COLIN JAMES. Impurities in metals, their influence on structure and properties. 2nd edition. London 1930. pp. xiv + 190. ill. 18*s*. net. (*Recd.* 20/11/30.)

STEWART, ALFRED WALTER. Recent advances in physical and inorganic chemistry. 6th edition. London 1930. pp. xii + 387. ill. 18*s*. net. (*Recd.* 20/11/30.)

TATE, FRANCIS GEORGE HENRY. Alcoholometry: an account of the British method of alcoholic strength determination. With an historical introduction written in collaboration with GEORGE HUGH GABB. London 1930. pp. xviii + 93. ill. 5*s*. net. (*Recd.* 20/10/30.)

THOM, CHARLES. The Penicillia. [Baltimore, Md.] 1930. pp. xiv + 644. ill. 45*s*. net. (*Recd.* 20/11/30.)

[UNITED STATES] NATIONAL RESEARCH COUNCIL. A report of the Committee on the construction and equipment of chemical laboratories. New York 1930. pp. xiv + 340. ill. 5*s*. net. (*Recd*. 8/11/30.)

WITTIG, GEORG. Stereochemie. Leipzig 1930. pp. xii + 388. ill. *M*. 25. (*Recd*. 11/11/30.)

ZERR, GEORG, and RÜBENCAMP, R. Handbuch der Farbenfabrikation. 4th edition. Berlin [1930]. pp. xvi + 962. ill. *M*. 45. (*Recd*. 11/11/30.)

III. *Pamphlets presented by Dr. T. Slater Price, O.B.E., F.R.S.*

DENNING, ARTHUR DU PRÉ. Ueber die Viskosität und die magnetische Doppelbrechung des colloidalen Eisenoxyhydrates. Heidelberg 1904. pp. 38. ill.

FARMER, ROBERT CROSBIE. Über sogenannte Oxyazokörper sowie Chinonoxime und Ketoxime. Würzburg 1899. pp. 71.

GOODWIN, HARRY MANLEY, and KALMUS, HERBERT T. On the latent heat of fusion and the specific heat of salts in the solid and liquid state. (From the *Phys. Rev*., 1909, **28**.)

GOODWIN, HARRY MANLEY, and MAILEY, R. D. On the density, electrical conductivity and viscosity of fused salts and their mixtures. (From the *Phys. Rev*., 1907–8, **25–26**.)

HULETT, GEORGE AUGUSTUS. Mercurous sulphate and the standard cells. (From the *Phys. Rev*., 1906, **22**.)

—— The cadmium standard cell. (From the *Phys. Rev*., 1906, **23**.)

—— Mercurous sulphate, cadmium sulphate and the cadmium cell. (From the *Phys. Rev*., 1907, **25**.)

—— A standard battery. (From the *Phys. Rev*., 1908, **27**.)

—— Equilibria in standard cells. (From the *Phys. Rev*., 1908, **27**.)

—— The cathode equilibrium in the Weston standard cell. (From the *Phys. Rev*., 1910, **30**.)

—— The construction of standard cells and a constant temperature bath. (From the *Phys. Rev*., 1911, **32**.)

—— The distillation of amalgams and the purification of mercury. (From the *Phys. Rev*., 1911, **33**.)

HULETT, GEORGE AUGUSTUS, and CARHART, HENRY SMITH. A study of the materials used in standard cells and their preparation. St. Louis 1904. pp. 19. ill.

HULETT, GEORGE AUGUSTUS, and MINCHIN, HOWARD D. The distillation of amalgams and the purification of mercury. (From the *Phys. Rev*., 1905, **21**.)

LEHMANN, ADOLF [LUDWIG FERDINAND]. Das Diphenyldibenzoyl-crotonylen und einige seiner Reduktionsprodukte. Leipzig 1897. pp. 39.

LEWIS, GILBERT NEWTON. Outlines of a new system of thermodynamic chemistry. (From the *Proc. American Acad. Arts Sci.*, 1907, **43**.)

LLOYD, JOHN ALEXANDER. Nitraniline und Nitrosoaniline als Pseudobasen. Würzburg 1903. pp. 67.

ROBERTSON, GEORGE. Ueber die Verseifungs- und Reduktionsprodukte des Phenyldibenzoylglutarsäurediäthylesters. Leipzig 1899. pp. 39.

SAND, HENRY JULIUS SALOMON. Zur Kenntnis von Alphylnitrosokörpern. Zürich 1898. pp. 78.

SMITH, LONGFIELD. Über einige Derivate des α-Methyl-β-ketopentamethenylens (Looft's Keton). Leipzig 1898. pp. 27.

IV. *Miscellaneous Pamphlets.*

AUSTRALIA, COMMONWEALTH OF. *Council for Scientific and Industrial Research.* Bulletin No. 45. A soil survey of the Woorinen settlement, Swan Hill irrigation district, Victoria. By J. K. TAYLOR and F. PENMAN. Melbourne 1930. pp. 41. ill.

BERKHOUT, P. J. TEDING VAN. Determination of rest-nitrogen in the blood of inhabitants of the tropics. (From the *Med. Dienst Volksgezondheid Ned.-Indie*, 1930.) ill.

BRADFORD, CITY OF. Conditioning house. [Regulations. 13th edition.] Bradford 1930. pp. iv + 80. ill.

MONIER-WILLIAMS, GORDON WICKHAM. The effect on foods of fumigation with hydrogen cyanide. (*Ministry of Health Reports on Public Health and Medical Subjects*, No. 60.) London 1930. pp. 32.

OBINATA, ICHIJI. On the nature of eutectoid-transformation of aluminium-bronze. Part II. Effect of quenching velocity. (From the *Mem. Ryojun Coll. Eng.*, 1930, **3**.) ill.

PENFOLD, ARTHUR RAMON. Eucalyptus, the essence of Australia. Sydney 1930. pp. 8. ill.

SCHREINEMACHERS, HENDRIK HUBERT. Reac[illegible]snelheden van 1.chloor (broom) 2.4.dinitrobenzol met amin[illegible]. Leiden 1930. pp. xii + 123.

SCHUETTE, H. A., and THOMAS, RALPH W[illegible]. The composition of the fat of the silver black fox. (From th[illegible] *Trans. Wisconsin Acad. Sci.*, 1930, **25**.)

SCIENTIFIC AND INDUSTRIAL RESEARCH. Department of. *Building Research.* Bulletin No. 7. Hot cement. By N. DAVEY. London 1930. pp. iv + 9. ill.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, December 4th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	Died.
John Foggie	Dec. 5th, 1889.	Nov. 29th.
Edward William Voelcker	Feb. 21st, 1884.	Nov. 22nd.
William Ernest Wild	June 16th, 1898.	

Forms of Recommendation for Fellowship were read for the first time in favour of:

Maurice Brent, B.Sc., A.R.C.S., Frogmore, The Drive, Wembley Park.
Geoffrey Frank Carter, B.Sc., A.R.C.S., 1B, Broadlands Road, Highgate, N. 6.
Mahendra Harilal Desai, B.Sc., 24, Queensborough Terrace, Bayswater, W. 2.
Thomas William Evans, 2, Ellesmere Road, Pemberton, Wigan.
Ivy Kathleen Faith, B.Sc., Bush Lodge, Southgate, N. 14.
John Albert Charles Flohren, B.Sc., 8, Conway Road, N. 15.
Ernest William Lambert, B.A., 264, Ardgowan Road, Catford, S.E. 6.
Phyllis Nanney, M.Sc., 15, Morland Road, Didsbury, Manchester.
Wilfred Louis Offer, B.Sc., St. Mary's School House, Ealing Green, W. 5.
Sydney Stewart Randall, B.Sc., 7, Whitford Gardens, Mitcham.
Oswald Victor Richards, B.Sc., Sherborne, First Avenue, Leeds Road, Wakefield.
Hemendra Kumar Sen, M.A., D.Sc., c/o Messrs. Thomas Cook & Son, Berkeley Street, W. 1.
Norman Charles Wright, M.A., Ph.D., Hannah Dairy Research Institute, Auchincruive, Ayr.

Dr. J. G. F. Druce and Dr. D. C. Jones were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently duly elected as Fellows:

Frederick George Angell, B.Sc.
Alfred William Baldwin, B.Sc., Ph.D.
William Edward Batten, A.R.C.S.
William Andrew Beattie.
Ernest George Beckett, Ph.D., F.I.C.
Hugh Kenneth Black, B.Sc.
George Frederic Bloomfield, B.Sc., A.R.C.S.
John Bradley, B.A., B.Sc.
Dhirendra Nath Chakravarti, M.Sc.

Monmohan Chandra, B.Sc.
John Christie.
Frederick Charles Clapham.
Ernest Gordon Cox, B.Sc.
Harold Albert Hadleigh Crowther.
Joseph Spencer Fawcett.
Arthur Lawrence Fox, B.A., M.S., Ph.D.
Herbert Freundlich, Prof., Ph.D.
Victor Gallafent, B.Sc., A.R.C.S.
Bhawan Showkiram Gidvani, B.Sc.
Joseph Glassman, B.Sc.
Rudolph Maximilian Goepp, Junr., B.S.
Evelyn Reid Lindsay Gow, B.Sc.
Arthur Neville Hambly.
Frederick William Hampshire.
Thomas Lane Harris, B.Sc.
Ralph Gordon Harry.
Margaret Mary Healey, B.Sc.
Robert Haxwell Hicks.
Douglas William Hill, B.Sc., Ph.D.
Harold Hinde.
Cyril Gustav Bidwell Hose, A.R.C.S.
Eric Charles Edward Hunter, B.Sc.
George Harold Jeffery, B.Sc.
Matsusuke Kobayashi, Prof., D.Sc.
Ralph Arthur Letch, A.R.C.S.
William Byres McKay, B.Sc.
George William Grant Maclennan, M.A., B.Sc.
John Macniven.
Roy James MacWalter, B.Sc.
Kishen Lal Malhotra, M.Sc.
Harold John Moss, B.Sc.
Ernest Gilbert Noble, A.R.C.S.
Thomas John Vernon Parry.
William Frank Pavitt, A.I.C.
Reginald John William Reynolds, B.Sc.
Clifford Arthur Rhodes, B.Sc.
Anthony Melland Robinson, B.A.
Chandulal Chhotalal Shah, M.Sc.
Christine Mary Snow, B.A., B.Sc.
Maurice Stacey, B.Sc.
George Basil Stafford, B.Sc.
Joseph John Sullivan, Prof., M.A., Ph.D.
John Frederick Felix Trotter, B.Sc., A.R.C.S.
Evelyn Marie Waldron, B.Sc.
Eric Mervyn Watson, B.Sc., A.I.C.
Gilbert Hayes Whiteford, B.S., A.M., Ph.D.
Evan Clifford Williams, D.Sc.
Patrick Chisholm Young, B.A.

The following papers were read :

" Nitrogen tri-iodide." By H. W. CREMER and D. R. DUNCAN.

" Experiments on the synthesis of anthocyanins. Part VI. The synthesis of chrysanthemin chloride." By S. MURAKAMI, A. ROBERTSON, and R. ROBINSON.

" Experiments on the synthesis of anthocyanins. Part VII. The four isomeric β-glucosides of pelargonidin chloride." By A. LEÓN, A. ROBERTSON, R. ROBINSON, and T. R. SESHADRI.

" Experiments on the synthesis of anthocyanins. Part VIII. A synthesis of oenin chloride." By F. L. LEVY, T. POSTERNAK, and R. ROBINSON.

Extra Meeting held in the Chemical Lecture Theatre of the Imperial College of Science and Technology (by permission of the Governors) on Thursday, December 11th, 1930, at 5.30 p.m.

The President, Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., was in the Chair.

The PRESIDENT referred to the death of Professor H. B. Dixon, who had agreed to deliver the Third Liversidge Lecture on November

27th, and stated that Professor W. A. Bone had kindly accepted the invitation of the Council to give the Lecture.

He then called upon Professor Bone to deliver the Lecture entitled "Fifty Years' Experimental Research upon the Influence of Steam on the Combustion of Carbonic Oxide (1880–1930)."

At the conclusion of the Lecture, which was illustrated by experiments, a vote of thanks to the Lecturer, proposed by Professor H. E. Armstrong, and seconded by Professor J. R. Partington, was carried with acclamation, and acknowledged by Professor Bone.

The PRESIDENT expressed the thanks of the Society to the Governors of the College for the use of the Lecture Theatre.

Ordinary Scientific Meeting, Thursday, December 18th, 1930, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows :—

	Elected.	*Died.*
Henry Borns	March 17th, 1881.	Dec. 12th, 1930.
Robert Charles Cowley.....	Dec. 3rd, 1908.	May 2nd, 1930.

Mr. J. F. F. Trotter, Mr. W. E. Batten, and Professor F. M. Rowe were formally admitted Fellows of the Chemical Society.

Forms of Recommendation for Fellowship were read for the first time in favour of :—

Frederick Cecil Hymas, B.Sc., A.I.C., 15, Raleigh Road, Enfield.
Ethel Margaret Luis, B.Sc., Taychreggan, Broughty Ferry, Angus.
Henry Alfred Piggott, 7, Maple Avenue, Cheadle Hulme, Cheshire.
Douglas John Cruickshank Pirie, B.Sc., 21, Park Avenue, Carnoustie, Angus.

The following Forms of Recommendation for Fellowship have been authorised by the Council for presentation to ballot under Bye-Law I (2) :—

Torbjörn Gaarder, D.Phil., Biochemical Laboratory, Bergen Museum, Bergen.
Henri Goldstein, Prof., D.-ès-Sc., Place du Chateau 3, Lausanne.
Frank Clifford Whitmore, A.M., Ph.D., State College, Pennsylvania, U.S.A.

The following papers were read :—

"1-ω-Halogenoalkyl*iso*quinolines and their derivatives." By R. CHILD and F. L. PYMAN.

"A synthesis of hydrastine. Part I." By E. HOPE, F. L. PYMAN, F. G. P. REMFRY, and R. ROBINSON.

"The mechanism of, and constitutional factors controlling, the hydrolysis of carboxylic esters. Part V. Influence of alkyl groups on hydrolytic stability maxima." By C. M. GROOCOCK, C. K. INGOLD, A. JACKSON, and M. I. KELLY.

"The mechanism of and constitutional factors controlling the hydrolysis of carboxylic esters. Part VI. Speeds of consecutive stages of saponification of some normal dicarboxylic esters." By C. K. INGOLD.

The Council has made the following grants from the Research Fund :—

	£	s.	d.
Hydrogen-ion activities of maleic and fumaric acids, and of certain corresponding substituted acids. H. W. Ashton. (East London Coll.)	13	0	0
Derivatives of the *o*-xylidines. E. E. Ayling. (Univ. Coll. Swansea)	7	0	0
Phosphorus derivatives of triarylcarbinols. C. H. Beale. (Univ. Coll., Southampton)	10	0	0
Additive properties of substituted butadienes. G. F. Bloomfield. (Imperial Coll.)	8	10	0
Halogenation of anilides and phenolic ethers. A. E. Bradfield. (Univ. Coll., Bangor)	13	0	0
Ester addition to conjugated esters and ketones. N. Brent. (Imperial Coll.)	7	0	0
Complexes formed in solutions from organic hydroxy-acids and metallic bases. H. T. S. Britton. (Univ. Coll., Exeter) ...	8	10	0
Cannabis Indica resin. H. S. Cahn. (Univ. Coll., Bangor) ...	7	10	0
Constitution of the aloins. R. S. Cahn. (Univ. Coll., Bangor)	7	10	0
The chemistry of unsaturated malonic acids. G. F. Carter. (Imperial Coll.)	6	0	0
Derivatives of methyl phloroglucinol and methyl hydroxyquinol. F. H. S. Curd. (Lond. Sch. of Hygiene)	10	0	0
Thiazine derivatives and allied substances. H. D. K. Drew. (East London Coll.)	8	10	0
Compounds of platinous chloride with phosphines. H. D. K. Drew. (East London Coll.)	13	0	0
Hydroxycarbonyl compounds. J. A. C. Flohren. (East London Coll.)	7	10	0
Extensions of Smiles' reaction. D. T. Gibson. (Glasgow Univ.)	5	0	0
Constitution of carboxyglutaconic esters. B. S. Gidvani. (Imperial Coll.)	8	10	0
Concentration cells of lithium halides in absolute alcohol. J. Glassman. (East London Coll.)	8	10	0
Organic compounds of phosphorus, more particularly phosphorus compounds derived from triphenylcarbinol. H. H. Hatt. (East London Coll.)	8	10	0
Dielectric constants of benzene solutions of some sulphur, selenium, and tellurium compounds, and of certain heterocyclic oxygen compounds. E. C. E. Hunter. (East London Coll.)	13	0	0
(*a*) Cytisine and related alkaloids (*b*) Quaternary ammonium bases in relation to physico-chemical and pharmacological properties. H. R. Ing. (Univ. Coll., London)	13	0	0
Dissociation constants of organic acids. G. H. Jeffrey. (Univ. Coll., Southampton)	13	0	0

" The use of the antimony-antimonous oxide electrode in the determination of the concentration of hydrogen ions, and in potentiometric titrations. The Prideaux–Ward universal buffer mixture." By H. T. S. BRITTON and R. A. ROBINSON.

" The polysulphides of the alkali metals. Part II. Lithium." By T. G. PEARSON and P. L. ROBINSON.

" The relative strengths of weak bases in non-aqueous solutions. Part IV." By J. R. PARTINGTON.

" The conductivity of electrolytes in nitromethane." By C. P. WRIGHT, D. M. MURRAY-RUST, and Sir H. HARTLEY.

" Syntheses of antiseptic derivatives of indan-1 : 3-dione. Part I. Interaction of malonyl chloride and of alkylmalonyl chlorides with the methyl ethers of resorcinol and 2-hydroxynaphthalene." By R. BLACK, H. SHAW, and T. K. WALKER.

" The propagation of flame in electric fields. Part I. Distortion of the flame surface." By E. M. GUÉNAULT and R. V. WHEELER.

" Salt-forming characteristics of doubly and singly linked elements of the oxygen group. Part I. The carbonyl group in benzaldehyde and acetophenone." By J. W. BAKER.

" Salt-forming characteristics of doubly and singly linked elements of the oxygen group. Part II. The nitration of benzaldehyde and acetophenone in sulphuric acid solution." J. W. BAKER and W. G. MOFFITT.

" Some physical properties of nicotine, and some compounds of nicotine." By H. BARRON.

" 10-Chloro-5 : 10-dihydrophenarsazine and its derivatives. Part XIV. Chloro-derivatives." By L. A. ELSON and C. S. GIBSON.

" *N*-Acyl derivatives of alanine. The resolution of externally compensated *m*-nitrobenzoylalanine." By W. M. COLLES and C. S. GIBSON.

" The kinetics of the reduction of cuprous oxide. Part I. The reduction at low pressures : with an appendix giving the results of further experiments on the oxidation of copper at low pressures." By F. J. WILKINS.

" *cyclo*Tellurobutane (tetrahydrotellurophen)." By G. T. MORGAN and F. H. BURSTALL.

" The conductivity of electrolytes in nitrobenzenes." By D. M. MURRAY-RUST, H. J. HADOW, and SIR H. HARTLEY.

" The essential oil of *Backhousia angustifolia*. Part III. The constitutions of angustione and dehydroangustione." By R. S. CAHN, C. S. GIBSON, A. R. PENFOLD, and J. L. SIMONSEN.

ADDITIONS TO THE LIBRARY.

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GATTERMANN, LUDWIG. Die Praxis des organischen Chemikers. 22nd edition. By HEINRICH WIELAND. Berlin 1930. pp. xii + 409. ill. *M.* 15. (*Recd.* 9/12/30.)

From Geh. Reg.-Rat Professor Dr. H. Wieland.

GLASSTONE, SAMUEL. The electrochemistry of solutions. London 1930. pp. xii + 476. ill. 21*s.* net. (*Recd.* 3/12/30.)

From the Publishers : Messrs. Methuen & Co.

PINE INSTITUTE OF AMERICA. Technical Bulletin No. 1. Rosin in synthetic resins. Prepared by W. B. BURNETT. Jacksonville, Fla. 1930. pp. vi + 97. (*Reference.*) [In mimeograph form.]

From the Institute.

REDGROVE, HERBERT STANLEY, and FOAN, GILBERT A. Paint, powder and patches. London 1930. pp. xii + 170. ill. 7*s.* 6*d.* net. (*Recd.* 1/12/30.)

From the Publishers : Messrs. William Heinemann.

II. *By Purchase.*

BODANSKY, MEYER. Introduction to physiological chemistry. 2nd edition. New York 1930. pp. x + 542. ill. 20*s.* net. (*Recd.* 22/11/30.)

BRUNOLD, CHARLES. L'entropie : son role dans le développement historique de la thermodynamique. Paris 1930. pp. vi + 221. 30 *fr.* (*Recd.* 17/11/30.)

—— Le problème de l'affinité chimique et l'atomistique. Paris 1930. pp. vi + 118. 20 *fr.* (*Recd.* 8/12/30.)

DAVY, SIR HUMPHRY. *See* GREGORY, JOSHUA CRAVEN.

DEWS, HERBERT CLIFFORD. The metallurgy of bronze. London 1930. pp. x + 147. ill. 12*s.* 6*d.* net. (*Recd.* 22/11/30.)

GREGORY, JOSHUA CRAVEN. The scientific achievements of Sir Humphry Davy. London 1930. pp. viii + 144. ill. 6*s.* net. (*Recd.* 22/11/30.)

HAAS, ARTHUR. Quantum chemistry : a short introduction in four non-mathematical lectures. Translated by L. W. CODD. London 1930. pp. x + 177. ill. 6*s.* net. (*Recd.* 22/11/30.)

JAEGER, FRANS MAURITS. I. Spatial arrangements of atomic systems and optical activity. II. Methods, results and problems of precise measurements at high temperatures. III. The construction and structure of ultramarines. New York 1930. pp. x + 450. ill. 20*s.* net. (*Recd.* 22/11/30.)

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(*a*) Syntheses of glucosides.			
(*b*) Hydroxy-carbonyl compounds. A. Robertson. (Lond. Sch. of Hygiene)	15	0	0
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Fellows are reminded that application for the Annual Reports for 1930, Volume XXVII, at 5*s*. 6*d*. per copy, should be made to Mr. S. E. Carr. Application must be accompanied by a remittance for 5*s*. 6*d*.

List of Papers, or abstracts thereof, received between November 20th, 1930, and December 18th, 1930. This List does not include the titles of papers which have been read at an Ordinary Scientific Meeting, or which have appeared in the Journal.

" An attempted preparation of methanetetrasulphonic acid." By F. B. KIPPING.

" Digitalis glucosides. Part III. Glucosides of *Digitalis lanata*." By S. SMITH.

" 2-Hydroxy-4-methoxy- and 2-methoxy-4-hydroxy-benzaldehydes." By (MISS) T. E. DE KIEWIET and H. STEPHEN.

" The chlorination of iodophenols. Part III. The chlorination of *o*-iodophenol." By S. BUCHAN and H. MCCOMBIE.

" The relative strengths of bases in non-aqueous solutions. Part III." By E. I. JOHNSON and J. R. PARTINGTON.

" The action of Beckmann's mixture on some monocyclic terpenes. Part II. Terpinolene and ' origanene.' " By T. A. HENRY and H. PAGET.

" Some aliphatic compounds of arsenic." By W. J. C. DYKE, G. DAVIES, and W. J. JONES.

" Naphthalene-1 : 5-disulphonic acid as a by-product in the monosulphonation of naphthalene." By C. B. RADCLIFFE and W. F. SHORT.

" Studies in the naphthalene series. Part III. The preparation of 3-amino-2-naphthyl methyl ether." By G. W. B. JAMBUSERWALA, S. HOLT, and F. A. MASON.

" Studies in the naphthalene series. Part IV. The preparation and properties of 2-naphthol-3-sulphonic acid." By S. HOLT and F. A. MASON.

" The mechanism of the oxidation of laudanosine." By V. K. BHAGWAT, D. K. MOORE, and F. L. PYMAN.

" The relative directive powers of groups of the forms RO and RR'N in aromatic substitution. Part IX. The nitration of *p*-acetoxyanisole and *p*-benzyloxyanisole." By J. C. SMITH.

KRONIG, R. DE L. Band spectra and molecular structure. Cambridge 1930. pp. x + 163. ill. 10*s*. 6*d*. net. (*Recd.* 22/11/30.)

WISSENSCHAFTLICHE ZENTRALSTELLE FÜR ÖL- UND FETTFORSCHUNG, E. V. (WIZÖFF), BERLIN. Einheitliche Untersuchungsmethoden für die Fett- und Wachsindustrie. Part I (2nd edition) bound with Part II (1st edition). Stuttgart 1930. pp. 241. ill. *M*. 16.50. (*Recd.* 2/12/30.)

III. *Pamphlets.*

BAKER, JOHN WILLIAM. Direction of addition of hydrogen bromide to α-methyleneglutaric acid. (From the *Proc. Leeds Phil. Soc.*, 1930, **2**.)

BURTON, HAROLD. Mobile anion tautomerism. Part V. γ-Phenyl-α-*p*-dimethylaminophenylallyl alcohol. (Preliminary notice.) (From the *Proc. Leeds Phil. Soc.*, 1930, **2**.)

INSTITUTION OF CHEMICAL ENGINEERS. The training of a chemical engineer. London 1925. pp. 7.

NORRIS, DOROTHY, and BATES, H. T. Notes on the establishment of *Aleurites Fordii* (tung oil) in the Ranchi district of Chota Nagpur. (From the *Indian Forester*, 1930.)

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. *Building Research.* Bulletin No. 8. Ultra-violet window-glazing. By H. E. BECKETT. London 1930. pp. iv + 13. ill.

—— —— Bulletin No. 9. Bonding new concrete to old. By NORMAN DAVEY. London 1930. pp. iv + 4. ill.

—— —— Special Report No. 16. Construction joints in concrete. Bonding new concrete to old. By NORMAN DAVEY. London 1930. pp. vi + 74. ill.

—— —— Technical Paper No. 9. The estimation of free calcium hydroxide in set cements. A calorimetric method. By GEORGE EDWARD BESSEY. London 1930. pp. iv + 25.

—— —— Technical Papers Nos. 10–12. Studies in reinforced concrete. Parts I–III. By WILLIAM HENRY GLANVILLE. London 1930. pp. vi + 37, vi + 49, vi + 39. ill.

—— *Committee on Welded Containers.* Report. London 1930. pp. iv + 51. ill.

—— *Food Investigation Board.* Special Report No. 3. The methods used for the inspection of canned foods and their reliability for this purpose. Part I. Canned meat. By WILLIAM GEORGE SAVAGE. London 1920. pp. 23.

—— —— Special Report No. 10. The methods used for the inspection of canned foods. Part II. Canned marine products. By WILLIAM GEORGE SAVAGE. London 1922. pp. iv + 32.

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. *Food Investigation Board.* Special Report No. 38. Wastage in imported fruit: its nature, extent and prevention. By J. BARKER. London 1930. pp. vi + 62. ill.

—— —— Special Report No. 39. The prevention of wastage in New Zealand apples. By J. BARKER. London 1930. pp. vi + 26. ill.

—— *Fuel Research.* Physical and chemical survey of the national coal resources, No. 17. The significance of spores in the correlation of coal seams. Part I.—The Parkgate seam—South Yorkshire area. By L. SLATER, MARJORIE M. EVANS, and GLADYS E. EDDY. London 1930. pp. vi + 28. ill.

—— —— Technical Paper No. 25. The reactivity of coke. 3.—The influence of iron compounds. By JOHN HENRY JONES, JAMES GRIEVE KING and FRANK STURDY SINNATT. London 1930. pp. viii + 32. ill.

—— —— Technical Paper No. 26. The influence of size of coal during gas manufacture. London 1930. pp. vi + 55. ill.

—— —— Technical Paper No. 27. The measurement of a rapidly fluctuating flow of gas. By JAMES GRIEVE KING and B. H. WILLIAMS. London 1930. pp. vi + 18. ill.

—— —— Technical Paper No. 28. The determination of aromatic, unsaturated and naphthene hydrocarbons in light oils and motor spirits. By ALEXANDER BERNARD MANNING and F. M. E. SHEPHERD. London 1930. pp. iv + 14. ill.

—— *Steel Structures Research.* Verbatim proceedings of a conference . . ., 16th October 1930. London 1930. pp. iv + 38.

SHERWOOD, R. C. Effects of wheat drying upon milling and baking properties. (Bulletin No. 66, State Dept. Agric., Minnesota.) St. Paul, Minn. 1929. pp. 36. ill.

SOUTH AFRICA, UNION OF. *Department of Agriculture.* (Division of Chemistry Series, No. 104.) Studies in pasture management. A preliminary report on the seasonal composition of certain South African pasture grasses in relation to their manuring and intensity of grazing. By R. R. STAPLES and A. J. TAYLOR. (From the *S. African J. Sci.*, 1929, **26**.). ill.

—— —— (Division of Chemistry Series, No. 105.) Citrus by-products research: orange oil. (From *Farming in S. Africa*, 1930.)

—— —— (Division of Chemistry Series, No. 110.) Microchemical analysis of soils. By JOHANNES LODEWIKUS STEENKAMP. (From the *J. S. African Chem. Inst.*, 1930.)

—— —— (Division of Chemistry Series, No. 111.) Notes on the colorimetric determination of p_H values in alkaline soils. By P. KAMERMAN. (From the *J. S. African Chem. Inst.*, 1930.)

SOUTH AFRICA, UNION OF. *Department of Agriculture.* (Division of Chemistry Series, No. 112.) Certain aspects of the acid to sugar ratio in oranges. By D. J. R. VAN WIJK. (From the *J. S. African Chem. Inst.*, 1930.)

SOUTH MANCHURIA RAILWAY COMPANY. Abstracts from the Report of the Central Laboratory. Dairen 1929. pp. 42. ill.

SPRUYT, J. P. Een onderzoek naar een colorimetrische methode voor de keuring van rijst op zilvervlies- (anti-beri-beri-vitamine-) gehalte. (From the *Med. Dienst. Volksgezond. Ned.-Indie*, 1930.)

TAYLOR, FRANK SHERWOOD. A survey of Greek alchemy. (From the *J. Hellenic Studies*, 1930, **50**.) ill.

UNITED STATES. *Department of Agriculture.* Technical Bulletin No. 169. The wearing quality and other properties of vegetable-tanned and of chrome-retanned sole leather. By R. W. FREY and I. D. CLARKE. Washington 1930. pp. 17. ill.

—— —— Technical Bulletin No. 170. A pipette method of mechanical analysis of soils based on improved dispersion procedure. By L. B. OLMSTEAD, LYLE T. ALEXANDER, and H. E. MIDDLETON. Washington 1930. pp. 22. ill.

—— —— Technical Bulletin No. 178. Properties of soils which influence soil erosion. By H. E. MIDDLETON. Washington 1930. pp. 16.

—— *Department of Commerce.* Bureau of Mines. Bulletin 281. Precipitation of lead and copper from solution on sponge iron. By G. L. OLDRIGHT [and others]. Washington 1928. pp. viii + 131. ill.

—— —— —— Bulletin 294. Carburetion of combustible gas with butane and propane-butane mixtures with particular reference to the carburetion of water gas. [By WILLIAM W. ODELL.] Washington 1929. pp. vi + 96. ill.

—— —— —— Technical Paper 409. Spontaneous heating of coal. By JOSEPH D. DAVIS and D. A. REYNOLDS. Washington 1928. pp. vi + 74. ill.

—— —— —— Technical Paper 424. Thermodynamic properties of oxygen and nitrogen. By RUSSELL W. MILLAR and JOHN D. SULLIVAN. Washington 1928. pp. ii + 20. ill.

—— —— —— Technical Paper 446. Terminology in coal research. By REINHARDT THIESSEN and WILFRID FRANCIS. Washington 1929. pp. iv + 27. ill.

—— —— —— Technical Paper 448. Coal-dust explosions in mines: causes, effects, and recommendations for prevention. By GEORGE S. RICE. Washington 1929. pp. ii+ 24.

—— —— —— Technical Paper 450. Inflammability of mixed gases. By G. W. JONES. Washington 1929. pp. iv + 38. ill.

UNITED STATES. *Department of Commerce.* Bureau of Mines. Technical Paper 451. Calcium sulphate retarders for Portland cement clinker. By ERNEST E. BERGER. Washington 1929. pp. ii + 35. ill.

—— —— —— Technical Paper 456. Classification and tabling of difficult ores with particular attention to fluorspar. By W. H. COGHILL. Washington 1929. pp. ii + 40. ill.

—— —— —— Technical Paper 462. Safety at natural-gasoline plants. By G. B. SHEA. Washington 1929. pp. vi + 109. ill.

—— —— Bureau of Standards. Domestic and industrial fuel oils. Commercial standard CS12–29. Washington 1929. pp. vi + 10.

—— —— —— Circular No. 377. Some properties of sponge rubber. Washington 1929. pp. 8. ill.

—— —— —— Circular No. 381. Sodium oxalate as a standard in volumetric analysis. pp. 9.

—— —— —— Circular No. 382. Bismuth. [By J. G. THOMPSON.] Washington 1930. pp. 41.

—— —— —— Miscellaneous Publication No. 108. Manufacture and properties of a cellulose product (maizolith) from cornstalks and corncobs. By C. E. HARTFORD. Washington 1930. pp. 10.

WEST, CLARENCE JAY. [Compiler.] Five years of research in industry 1926–1930. A reading list. New York 1930. pp. 91.

WITTE, ADOLF ANTONIUS MARIA. Nitro-benzolsulfonhydraziden. Leiden 1930. pp. xii + 119.

WOERDEN, SIMON VAN. Refractometrisch onderzoek van methyl-hexahydroacetophenonen. Leiden 1924. pp. viii + 84.

WRIGHT, CHARLES HAROLD. Correlations between the specific conductivities of soil extracts, nitric nitrogen and soluble calcium. (From the *8th Ann. Bull., Agric. Dept. Nigeria*, 1929.) ill.

ZAPAN, MIHAI. Sur la chloruration et la bromuration catalytiques des gaz riches en hydrocarbures méthaniques. Paris 1930. pp. 101. ill.