ALEXANDER SMITH.

Edinburgh, Scotland, 1865. Edinburgh, Scotland, Sept. 9, 1922.

From Edinburgh, Scotland, his birthplace, comes the announcement of the death of Professor Alexander Smith, a distinguished and honored member of our Academy, lately head of the department of chemistry at Columbia University in New York.

About three years ago while addressing a class he was stricken with a fainting spell caused by the fatal malady. Shortly afterward he underwent operation for tumor of the stomach. The hoped for recovery with restoration to health did not come. He suffered intense depression and was an invalid from that time on. While the termination, on September 9, 1922, of the long and insidious illness which clouded his latter days was not unexpected, his loss is a heavy one for chemistry.

Alexander Smith, son of a well known musician of Edinburgh, had the advantage of the best chemical training available in Europe during his student days. He received the degree B.Sc. at the University of Edinburgh in 1886; the Ph.D. degree at the University of Munich, as a student of the master organic chemist, Adolph Von Baeyer, in 1889, and during 1890 served as assistant in chemistry in the University of Edinburgh.

Thus splendidly equipped for the work of a teacher of chemistry Smith came in the fall of 1891 to the professorship of chemistry in Wabash College at Crawfordsville, Indiana. He soon became identified with the science organizations of the State and was elected to membership in the Indiana Academy of Science at the December meeting 1891. During the years following he contributed much to the success of the annual meetings of the Academy, especially in the chemistry-physics section, through forceful discussion and through presentation of papers concerning his researches on 1:3 and 1:4 di-ketones, syntheses by means of potassium cyanide, and the constitution of calomel vapor.

Alexander Smith was a gentleman of polished manner, pleasing address and striking personality. As those who knew him will recollect, his clear and sparkling eye constituted a very conspicuous and characteristic feature.

His election to Fellowship in the Academy occurred in 1893 and our records show that he remained active until 1908 when his name was placed on the non-resident list of members, he having been called from Wabash College to a professorship in the University of Chicago in 1894.

The bibliography contains a long list of titles of published researches and text books. The researches on sulphur and on vapor pressure in 1912 won for him the Keith Prize from the Royal Society of Edinburgh.

Smith's sphere of influence in chemistry was perhaps widest as a great teacher and as author of pre-eminent text-books, such as his "Introduction to General Inorganic Chemistry", "General Chemistry for Colleges", "A Laboratory Outline of General Chemistry", and others.

"Proc. 38th Meeting, 1922 (1923)."

These texts have had wide use in English speaking countries and most of them have been translated into German, Russian, Italian, Portuguese, Spanish, Chinese, and even into Urdu.

It was while serving as Director of General and Physical Chemistry in the University of Chicago that his teaching methods were chiefly developed. In fact, his career at Chicago was brilliant and intensely active. In addition to teaching and administrative work within his department he served as Dean of the Junior College of Science and possessed energy in reserve to continue investigative work.

In 1911 he was called to Columbia University as head of the department of chemistry which he proceeded to reorganize and expand in a fundamental way. With his characteristic overflowing enthusiasm, industry and vitality he continued active until forced by illness to desist.

Alexander Smith's career was a brilliant one but all too short. American chemical history presents the names of but few chemists of such attainment in a generation.

LIST OF PAPERS BY ALEXANDER SMITH.

I. PUBLISHED INVESTIGATIONS.

(a) Organic Chemistry.

1. Thesis, Ueber 1, 3-Diketone. Munich, 1889. Beiträge zur Kenntniss der 1, 3-Diketone [with Prof. Claisen]. Liebig's Annalen, *277* (1893), 184-206.
2. On Desylacetophenone. Journal of the Chemical Society, *57* (1890), 643-652.
3. Ueber Condensation mittelst Cyankalium. Berichte der deutschen chemischen Gesellschaft, *26* (1892), 60-65.
4. Ueber die Condensation von Aceton mit Benzoin mittels Cyankalium. Berichte der deutschen chemischen Gesellschaft, *26* (1892), 65-71.
5. Two Stereo-isomeric Hydrazones of Benzoin [with J. H. Ransom]. Royal Society Edin., Proceedings, 1894, pp. 201-202; American Chemical Journal, *16* (1894), 108-115.
6. Die Einwirkung von Hydrazin und von Phenylhydrazin auf 1, 4-Diketone. Liebig's Annalen, *289* (1896), 310-337.
7. Condensation with Benzoin by Means of Sodium Ethylate [Thesis of J. B. Garner]. University of Chicago Press, 1897.
8. On the Phenylhydrazones of Benzoin. American Chemical Journal, *22* (1899), 198-207.
9. On Potassium Cyanide as a Condensing Agent. American Chemical Journal, *22* (1899), 249-256.
10. Notizen ueber die Einwirkung von Phenylhydrazin auf einige 1, 4-Diketone [with H. N. McCoy]. Berichte der deutschen chemischen Gesellschaft, *35* (1902), 2169-2171.

(b) Inorganic and Physical Chemistry.

11. Amorphous Sulphur and Its Relation to the Freezing Point of Liquid Sulphur [with W. B. Holmes]. Royal Society Edin., Proceedings, 1902, pp. 290-301; Decennial Publications of the University of Chicago, IX; Zeitschrift für Physikalische Chemie, *42* (1903), 469-480.
12. On Two Liquid States of Sulphur, S_μ and S_λ, and Their Transition Point [with W. B. Holmes and E. S. Hall]. Royal Society Edin., Proceedings, 1905, 588-589; Zeitschrift für Physikalische Chemie, *52*, 602-625.
13. The Nature of the Amorphous Sulphur, and Contributions to the Study of the Influence of Foreign Bodies on the Phenomena of Supercooling Observed When Melted Sulphur is Suddenly Chilled [with W. B. Holmes]. Royal Society Edin., Proceedings, 1905, 590-592; Berichte der deutschen chemischen Gesellschaft, *35* (1902), 2992-2994; Zeitschrift für Physikalische Chemie, *54*, 257-293.
14. Further Study of the Two Forms of Liquid Sulphur as Dynamic Isomers [with C. M. Carson]. Royal Society Edin., Proceedings, 1906, 352-356; Zeitschrift für Physikalische Chemie, *57*, 689-717.

15. Ueber den amorphen Schwefel: V. Das System Schwefel-Jod [with C. M. Carson]. Zeitschrift für Physikalische Chemie, *61* (1907), 200-208.

16. Amorphous Sulphur VI. Precipitated Sulphur [with R. H. Brownlee]. Royal Society Edin., Proceedings, 1907, 308-311; Zeitschrift für Physikalische Chemie, *61* (1917), 209-226.

17. The Solubilities of Ortho-phosphoric Acid and Its Hydrates, A New Hydrate [with A. W. C. Menzies]. Jour. Amer. Chem. Soc., *31* (1909), 1183-1191.

18. The Electrical Conductivity and Viscosity of Concentrated Solutions of Ortho-phosphoric Acid [with A. W. C. Menzies]. Jour. Amer. Chem. Soc., *31* (1909), 1191-1194.

19. The Rehabilitation of the American College and the Place of Chemistery in it. Science, *30* (1910), 457-466.

20. Does Calomel Furnish Another Contradiction of the Theory of Heterogeneous Dissociation Equilibrium? Jour. Amer. Chem. Soc., *32* (1910), 187-189.

21. A Common Thermometric Error in the Determination of Boiling Points under Reduced Pressure [with A. W. C. Menzies]. Jour. Amer. Chem. Soc., *32* (1910), 903-907.

22. Studies in Vapor Pressures I. A Method for Determining under Constant Conditions the Boiling Points of even minute quantities of Liquids and of Non-fusing Solids [with A. W. C. Menzies]. Jour. Amer. Chem. Soc., *32* (1910), 897-905.

23. Studies in Vapor Pressures II. A Simple Dynamic Method, applicable to both solids and liquids, for Determining Vapor Pressures and also Boiling Points at Standard Pressures [with A. W. C. Menzies]. Jour. Amer. Chem. Soc., *32* (1910), 907-910.

24. A New Hydrate of Ortho-phosphoric Acid [with A. W. C. Menzies]. Royal Society Edin., Proceedings, *30*, 1910, 63-64.

25. Studies in Vapor Pressures III. A Static Method for Determining the Vapor Pressure of Solids and Liquids [with A. W. C. Menzies]. Jour. Amer. Chem. Soc., *32* (1910), 1412-1434; Annalen der Physik, *33*, 971-978.

26. Studies in Vapor Pressures IV. A Redetermination of the Vapor Pressures of Mercury from 250-435 degrees. Jour. Amer. Chem. Soc., *32* (1910), 1434-1447; Annalen der Physik, *33*, 979-988.

27. Studies in Vapor Pressures V. A Dynamic Method for Measuring Vapor Pressures, with its Applications to Benzene and Ammonium Chloride. Jour. Amer. Chem. Soc., *32* (1910), 1448-1459; Annalen der Physik, *33*, 989-994.

28. Studies in Vapor Pressures VI. A Quantitative Study of the Constitution of Calomel Vapor. Jour. Amer. Chem. Soc., *32* (1910), 1541-1555.

29. Studies in Vapor Pressures VII. The Vapor Pressure of Dried Calomel. Zeitschrift für Physikalische Chemie, *76*, (1911), 713-720.

30. Amorphous Sulphur VII. The Freezing Point Curves of Liquid Sulphur [with C. M. Carson]. Zeitschrift für Physikalische Chemie, *77* (1911), 661-675.
31. An Early Physical Chemist—M. V. Lomonossov. Jour. Amer. Chem. Soc., *34* (1912), 109-119; Science, *35*, 121-129.
32. Dissociation Pressures of Ammonium and Tetra-Methyl-Ammonium Halides and of Phosphonium Iodide and Phosphorous Pentachloride [with R. P. Calvert]. Jour. Amer. Chem. Soc., *36*, (1914), 1363-1382.
33. The Densities and Degrees of Dissociation of the Saturated Vapors of the Ammonium Halides, and the Related Thermal Data [with R. H. Lombard]. Jour. Amer. Chem. Soc., *37* (1915), 38-69.
34. Density and Degree of Dissociation of the Saturated Vapor of Phosphorous Pentachloride [with R. H. Lombard]. Jour. Amer. Chem. Soc., *37* (1915), 2055-2062.
35. Determination of the Composition of the Vapors of Calomel, the Ammonium Halides and Phosphorous Pentachloride from Measurements of Vapor Pressure and Density. Zeitschrift für Elektrochemie, *22* (1916), 33-37.
36. Dissociation Pressures of Mercurous Chloride [with R. P. Calvert]. Jour. Amer. Chem. Soc. (1916), 801-807.
37. Allotropy and Solubility in Water of Ammonium Bromide [with H. E. Eastlack]. Jour. Amer. Chem. Soc., *38* (1916), 1261-1266.
38. Ammonium Iodide, its Solubilities and the Absence of a Transition Point. Jour. Amer. Chem. Soc., *38* (1916), 1500-1502.
39. The Training of Chemists. Jour. Ind. and Eng. Chem., *8* (1916), 527-533; Science, *43*, 619-629.
40. Transition of Dry Ammonium Chloride [with Herbert Eastlack and George Scatchard]. Jour. Amer. Chem. Soc., *41* (1919), 1961-1969.

II. BOOKS.

41. Lassar-Cohn, Laboratory Manual of Organic Chemistry [Translation]. Pp. xx+403, 8vo. London, Macmillan & Co., 1895.
42. A Laboratory Outline of General Chemistry. Pp. xii+88, 8vo. Chicago, University of Chicago Press, 1899. Reprinted 1900.
43. The Same. Second Edition, revised. Pp. xii+107. 1902. Reprinted 1903. Reprinted 1905.
44. The Same. Third Edition, revised in collaboration with W. J. Hale. Pp. ix+136. New York, The Century Co., June 1907.
45. The Same. Fourth Edition, revised [with W. J. Hale]. New York, The Century Co., January, 1908.
46. The Same. German Translation, by Professor F. Haber and Dr. Stoecker. Karlsruhe, 1904.
47. The Same. Russian Translation, by Dr. von Schmoelling. St. Petersburg, 1908.
48. The Same. Italian Translation, by Professor Peratoner and Dr. Pallazzo. Palermo, 1908.
49. Louis Pasteur, Researches on Molecular Asymmetry [Translation]. Pp. 46, 8vo. Alembic Club Reprints, No. 14.

50. The Teaching of Chemistry and Physics in the Secondary School. (The chapters dealing with Physics, specifically, were written by Professor Edwin H. Hall of Harvard University.) Pp. xiii+377, 8vo. New York and London, Longmans, Green & Co., 1902. Reprinted 1903.
51. J. H. Van't Hoff, Physical Chemistry in the Service of the Sciences [Translation]. Pp. xviii+126, 8vo. Chicago, University of Chicago Press, 1903.
52. Introduction to General Inorganic Chemistry. Pp. xviii+780, 8vo. New York, The Century Co.; London, Geo. Bell & Sons, March, 1906. Reprinted July, 1906, September, 1906, August, 1907, October, 1907 (completing fifteenth thousand).
53. General Chemistry for Colleges. Pp. xiii+529, 8vo. New York, The Century Co., May, 1908.
54. Einführung in die Allgemeine und Unorganische Chemie auf Elementar Grundlage [with Dr. E. Stern]. Karlsruhe, 1909.
55. Textbook of Elementary Chemistry. Pp. 439. New York, The Century Co., 1914.
56. General Chemistry for Colleges. Second Edition, revised. Pp. 662. New York, The Century Co., 1916.
57. Introduction to Inorganic Chemistry, New Edition. Third Edition, revised. Pp. 925. New York, The Century Co., 1917. This text has been translated into German, Portuguese, Italian, Russian and Chinese; it is now being translated into Spanish and Urdu.
58. A Laboratory Outline of College Chemistry. Pp. 206. New York, The Century Co., 1917.
59. Experimental Inorganic Chemistry. Fifth Edition of Laboratory Outline of General Chemistry, revised. Pp. 171. New York, The Century Co., 1917.
60. Calculations of Inorganic Chemistry and Qualitative Analysis [with W. C. Moore]. Pp. 106. New York, The Century Co., 1918.
61. Intermediate Textbook of Chemistry. Pp. 520. New York, The Century Co., 1919; London, G. Bell and Sons, Ltd., 1920.
62. A Laboratory Outline of Intermediate Chemistry. Pp. 136. New York, The Century Co., 1920.

III. ADDRESSES.

A large number of addresses, chiefly on various phases of the teaching of Chemistry, have been published in the School Review, School Science, and elsewhere.

IV. REVIEWS.

A large number of reviews of current books on Chemistry have been written for Science, The Journal of the American Chemical Society, School Science, The Journal of Physical Chemistry, The School Review, and other magazines.

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