OBITUARY NOTICES.

FRANCIS WILLIAM GRAY.

1874—1948.

FRANCIS WILLIAM GRAY was born at Old Machar, Aberdeenshire, on March 30th, 1874, and died at Aberdeen on July 2nd, 1948. After completing his school education at Aberdeen Grammar School, Gray entered the Faculty of Arts in the University of Aberdeen in 1891. Here he showed special ability in mathematics and graduated M.A. in 1896 with Honours in mathematics and natural philosophy. After spending two years, 1897—1899, as mathematics master at Airdrie School, Lanarkshire, Gray returned to Aberdeen University to take up the study more especially of chemistry and graduated B.Sc. in 1901. In the following year he was appointed an Assistant in the Chemistry Department, in 1904 was given the status of Lecturer, in 1911 was appointed Lecturer in Physical Chemistry and in 1916 became Senior Lecturer in Chemistry, a position which he retained until he retired in 1936.

At the time of Gray's appointment as University Assistant, the Chemistry Department of Aberdeen University under Professor F. R. Japp was essentially a school of organic chemistry, and Gray's first research work was an investigation of certain derivatives of anhydroacetonebenzil. The results of this investigation were published in the *Transactions* of the Society in 1909, and in the same year Gray was awarded the degree of D.Sc. by the University of Aberdeen for a thesis on keto-enolic isomers of anhydroacetonebenzil and its homologues.

With his special qualification in mathematics and physics it was only natural that Gray should find his main interest in physical chemistry; and after his appointment as lecturer in physical chemistry he devoted himself whole-heartedly to the development of this branch of science. At that time instruction in physical chemistry had but a small place in the chemistry curriculum at Aberdeen. However, in spite of many difficulties, lack of accommodation, and insufficient apparatus, Gray succeeded in building up a fairly adequate course of instruction and also began research in physical chemistry. From this period dates the publication of his " Practical Physical Chemistry," a small text-book written to meet the special needs of his students and the conditions under which instruction had to be given. Gray's interest in the practical side of instruction in physical chemistry was also shown in designing an adiabatic calorimeter, a description of which was published in the *Transactions* in 1914.

In the technique of teaching and in the systematisation of chemistry Gray was much interested. Believing that text-books on inorganic chemistry pay too little attention to the classifying and correlating of the facts with which they deal, he published in 1923 a small book, " The Chemistry Tangle Unravelled," with the sub-title " Chemistry systematised on a new plan based on the works of Abegg, Kossel, and Langmuir." The main purpose of the book, which received perhaps less notice than it deserved, was to give some indication of the wonderful orderliness that prevails throughout the subject in spite of a few anomalies. " By the tracing of this orderliness, the dull and uninviting drudgery of mere memorising gives place to a study that is fascinating and attractive."

Gray's special and most valuable contributions to science were in the field of diamagnetics. As early as 1914 he published in the *Transactions* " A magnetic study of compounds of water and aqueous solutions "; but, owing to the outbreak of war and, later, to increase of teaching and administrative duties, Gray's research was interrupted and was not resumed until about 1925. Using a Curie–Chéneveau balance, which he modified and improved so as to increase its accuracy (*J. Sci. Instr.*, 1932, **9**, 1; 1936, **13**, 13), Gray, with great intensity of application, carried out, or directed the investigation of, the diamagnetic properties not only of inorganic compounds, such as the polychromates, polyhalides, light and heavy water, but also of a number of organic compounds. In a theoretical paper, published in 1930 in the *Philosophical Magazine*, Gray discussed the subject of diamagnetism and sub-molecular structure. Later, in 1935, in a paper (*Trans. Faraday Soc.*, **31**, 1491) which may be regarded as the culmination of his life's work, Gray described a new method of treating atomic and molecular data, whereby deviations of the observed diamagnetism of molecules from that calculated from the diamagnetism of free atoms may be used to establish the modes of linking of atoms in molecules. He also showed that Pauling's theoretical and Pascal's experimental diamagnetic standards could be reconciled, and he enhanced their usefulness by a new plan linking the diamagnetism with dipole moments and other properties. It is a matter for profound regret that under the stress of intense mental

activity Gray's health broke. Although rest brought about an improvement of health he was forced to relinquish his work, the value and importance of which had received high commendation. He retired from active work in 1936.

During the long period of thirty-four years Gray served the Chemistry Department in the University of Aberdeen with great devotion and conscientiousness, and his assistance as Senior Lecturer in administering the work of the Department was of the highest value. As a teacher he was most painstaking and was very sympathetic with students in their difficulties. He had few interests outside chemistry and took no part in the general life of the University or of the major scientific societies. His reticence and shyness made it somewhat difficult to get to know him, but in time one came to recognise that beneath the surface there was a real sense of humour and a very kind, loyal, and self-sacrificing nature. By his colleagues and students alike he was held in high esteem.

ALEX. FINDLAY.

JOHN SCOTT LUMSDEN.

1867—1950.

JOHN SCOTT LUMSDEN was born in Dundee in 1867. He was educated at the West End Academy, until at the age of 14 he was apprenticed in an ironmongery warehouse for 7 years, during which he spent his evenings attending classes in Art in Dundee High School, and also elementary classes in Science under that inspiring teacher of Chemistry, Frank W. Young. At the age of 21 he became an assistant teacher of science at the Harris Academy. He then decided that he must aim at obtaining a University degree, and was accordingly allowed the free time to attend the necessary classes at University College, where he had the good fortune to come under the influence of Percy F. Frankland who had succeeded Carnelley in the Chemistry Chair. In 1891 he graduated B.Sc. (St. Andrews), subsequently obtaining the degree of D.Sc. In 1893 he was engaged in teaching and research. From 1893 until 1895 he studied in Munich in Baeyer's laboratory, carrying out research for the Ph.D. degree under the supervision of Einhorn. At that time Groth was at the height of his fame in Crystallography, and Lumsden maintained his interest in that subject throughout his subsequent career.

On his return from Germany he spent a short period in Mason College, Birmingham, as private assistant to Frankland, until in 1896 he returned to his native town as a member of James Walker's staff; he published several papers jointly with him, as well as papers in his own name. The summer of 1898 was spent in Ostwald's laboratory in Leipzig.

In 1896 he taught Chemistry in the evening classes of the Technical College, although it was not until 1900 that he became really interested in technical education. Afterwards he was appointed Director whilst still a member of Walker's staff. Meanwhile, the Governors of the Technical College decided to erect a new building, the present Technical College and School of Art, which was opened in 1912 with Lumsden as Principal. From 1918 until his retirement in 1929, the demands of the Technical College had increased to such an extent and were so arduous that his whole energy was necessarily devoted to administration for which he was admirably fitted.

In his Inaugural Dissertation, Munich (1895), he described the reduction of anisic acid which gave 4-ketohexahydrobenzoic acid as one of the products. This observation subsequently proved to be of considerable importance since W. H. Mills discovered that its oxime was capable of existing in optically active antimerides, whilst its ethyl ester in the hands of W. H. Perkin, jun., was utilised for the synthesis of both the optically inactive and the optically active terpineols. Amongst other researches of Lumsden were the following: determination of molecular weights; modification of Landsberger's boiling-point method (with Walker); the hydrobromides of undecylenic acid (with Walker); *n*-decanedicarboxylic acid (with Walker); solubilities of the calcium salts of the acetic acid series; the equilibrium between a solid and its saturated solution at various temperatures; a new vapour-density apparatus; a new form of pyrometer; the reduction products of anisic acid; the physical properties of heptoic, hexahydrobenzoic, and benzoic acids, and their derivatives; the liquid volume of a dissolved substance; criteria of the degree of purity of commercial toluene.

Lumsden completed 60 years of Fellowship of the Chemical Society on March 6th, 1950. He died on July 12th, 1950, and leaves a widow with three sons and a daughter.

ALEX. MCKENZIE.