Prof. J. N. Brønsted

PROF. JOHANNES NICOLAUS BRØNSTED died in Copenhagen on December 17, 1947, after holding the University chair of physical chemistry for nearly forty years. He was born in 1879 and spent his childhood in Jutland, where his father was employed as an engineer in connexion with land reclamation. Both his parents died while he was still a boy, and after going to school in Aarhus and Copenhagen, he began training as an engineer at the Polytechnic Institute in Copenhagen in 1898. However, it soon became clear that his interests were in chemistry, and he took the *Magister* degree in this subject in 1902, being appointed as assistant at the University Chemical Laboratory in 1905. He very soon became engrossed in the application of thermodynamics to physico-chemical problems, a subject which was to prove a central theme in all his subsequent work. A long series of papers in the years 1906–21 dealt with the theory and measurement of affinity changes, and it was the third of this series (dealing with binary mixtures) which was presented for his doctorate degree in 1908. In 1909 he was appointed (after close competition with Niels Bjerrum) to the newly instituted chair of physical chemistry, and was also made director of the physical chemistry laboratory of the Polytechnic Institute, where a great deal of his later work was carried out.

Some of Brønsted's work on affinity had dealt with electrolyte solutions, and in the period 1918–24 these became a special focus of interest. In particular he carried out an extensive series of solubility measurements, and was able to establish several simple and important general laws. When the theory of Debye and Hückel was published in 1923, it was satisfactory to find that its predictions agreed essentially with the relations already established by Brønsted, and the solubility measurements of Brønsted and LaMer (1924) still constitute some of the best evidence for the Debye–Hückel theory.

At about the same time Brønsted became interested in the kinetics of reactions in electrolyte solutions, and our present understanding of kinetic salt effects rests largely on his papers of 1920–24, which clarified a confused subject in a remarkable manner. This work directed his attention to acids and bases, and it is in this connexion that his name is most widely known to-day. The modern definition of acids and bases (proposed simultaneously in 1923 by Brønsted and by T. M. Lowry) has had a great clarifying influence in many branches of chemistry. In particular, it led to the idea of general acid-base catalysis, and although this idea had been previously suggested by H. M. Dawson and others, it was most clearly presented and justified in a series of papers by Brønsted and his colleagues on the decomposition of nitramide, the mutarotation of glucose, and various hydrolytic reactions.

In 1930 Brønsted moved to the new Physico-chemical Institute, where he enjoyed much better experimental facilities and a charming official residence. Here he continued work on reaction kinetics, especially in non-aqueous solvents, but also returned to thermodynamic problems. These latter included studies of the effect of molecular size on the thermodynamic properties of hydrocarbons, polymers and colloids. He also published several papers on the fundamental basis and formulation of the laws of thermodynamics, a subject which occupied his attention increasingly right up to his death.

Brønsted's fame to-day probably rests largely on his work on reaction kinetics and his definition of acids and bases, and it is perhaps not always realized how much he contributed to the fundamental thermodynamics of solutions. This firm foundation in thermodynamics left its mark on all his work, where an exact and elegant formulation of experimental conclusions was often coupled with a reluctance to speculate in terms of molecular models. Although he contributed little to the elaboration of practical techniques, his experimental work showed great skill in the choice of methods and of systems for investigation. He preferred to work independently of others, and the only notable example of collaboration outside his own field is his well-known work with G. von Hevesy on the separation of the isotopes of mercury. He did not suffer fools gladly among his research students; but it was a great inspiration to work under his guidance, and many foreign visitors enjoyed the hospitality of his laboratory from 1920 onwards. Brønsted himself travelled widely in Europe and paid one visit to the United States as a visiting professor at Yale. He received many honours from learned bodies abroad, such as the American Academy of Arts and Sciences, the Chemical Society of London, and also from the University of London.

Brønsted was a man of great personal charm and took a keen interest in the art, literature and natural history of several countries besides his own. During most of his life he played little part in public affairs, but the German occupation of Denmark led him to think more deeply on national and international questions, and in 1947 he became a member of parliament, though his last illness prevented him from taking his seat. He was one of the small band of great men of science who have given Denmark a scientific reputation quite out of proportion to her size, and he will be mourned by friends and colleagues in many parts of the world. R. P. BELL

Mr. Orville Wright

THE death on January 30 of Orville Wright marks the passing of the second of the great co-pioneers of mechanical flight (Wilbur Wright died in 1912), and of the man who actually made the first controlled and sustained flight in an aeroplane. Orville was born at Dayton, Ohio, on August 19, 1871, and was the fourth son of Bishop Milton Wright, Wilbur being the third. The two brothers grew up inseparable in youth and manhood; so close was their collaboration that their experimental work can be regarded only as a single achievement—though Wilbur, on account of his age and special gifts, may have been the leader.

In contrast to some other investigators, the Wright brothers approached the problem of flight by the method known to have been employed in Nature many millions of years ago, namely, through the evolutionary process of gliding, which they saw to be obligatory. Their contribution was, essentially, the devising of a complete system of control where none had previously existed; the design of effective cambered wings, determined by wind-tunnel research; the development of airscrews and the adaptation of a petrol engine; and, finally, the incorporation of all these devices in a practical machine.

The unique distinction of being the first man to fly in the true sense—which fell to Orville at Kitty Hawk, North Carolina, on December 17, 1903—was borne by him with dignity and charm. After