OBITUARY NOTICE.

JOHN THEODORE HEWITT.

1868—1954

At the age of nearly 86, and close to his cottage home in the country, John Theodore Hewitt was knocked down and killed by a motor-car which was in charge of an admittedly irresponsible driver. This was indeed a tragedy, for Hewitt had not yet grown old and was as keenly interested in the Chemistry of 1954 as he had been in that of 1894. Some of us who had had the good fortune to be his students had been planning for him to tell us, in writing or in a lecture, what he thought of the last 50 years, with its curious mixture of change and progress. We shall never know now, but we can be sure that he would have found it in his heart to tell us that all was well with chemistry: for had he not seen personality after personality dominate the chemical stage, one and all to be replaced by new figures, with new themes, new phrases, new dogmas and, in a few instances, new outlooks? Neither he nor any of his students ever became members of the power groups in chemistry and for this reason, if for no other, Hewitt stands almost alone as a person and . . . I was about to say " as a teacher ": this however would be wrong, for he was better than a teacher: he provided the atmosphere in which his students were unable to resist the desire to learn.

Hewitt was born at Windsor on October 12th, 1868. His father, who had a coachbuilding business, died at the age of 34. Hewitt's mother was able to buy a small private school in Newbury. Some years later Mrs. Hewitt secured the post of Headmistress at the Girls' College and High School of Southampton, so that she and John Theodore and his sister Marian went to this city to live. Mrs. Hewitt was able to induce the Principal of The Hartley Institute (now The University of Southampton) to allow her son to attend classes in chemistry, mathematics, machine drawing, and classics. The instruction in chemistry was given by the Southampton Public Analyst, James Brierley. Hewitt and W. R. Bower (later a physicist) won National Scholarships at the Normal School of Science (afterwards the Royal College of Science—Imperial College of Science and Technology). Hewitt, who was not 16 years of age until October 12th, 1884, worked in Percy F. Frankland's laboratory, mainly on qualitative inorganic analysis, and, from October 1885 to February 1886, studied physics and then, until the summer, also geology. During this period he decided that chemistry was more in his line than engineering, and in October 1886 he attended T. E. Thorpe's inorganic lectures. Later in the year he experienced the greatest pleasure in listening to Japp on organic chemistry. By now Hewitt was living with his mother and sister near St. Denys Station in Southampton. He seems from an early age to have been fascinated by railways. More than once he travelled on the footplate of fast trains on the Southampton run, and later in life he was full of reminiscences of incidents of railway journeys. It is curious to reflect that in his young manhood the railway locomotive held the record for speed.

In December 1886 Hewitt obtained a foundation scholarship at St. John's College, Cambridge. In June 1887 he became an Associate of the Royal College of Science (as it was later), but hoped that he could then escape from an academic life. In this he was unsuccessful, and he started at Cambridge in the autumn. He attended lectures given by James Dewar, Pattison Muir, and J. J. Thomson, and passed Part I of the Natural Sciences Tripos and the London Intermediate in the summer of 1889. Among his friends at Cambridge were R. A. Lehfeldt, Alfred Mond, F. F. Blackman, and F. S. Locke. His main recreations were walking and poker. His Part II chemistry was done under S. Ruhemann, W. J. Sell, and H. J. H. Fenton. Hewitt found Ruhemann an inspiring teacher. When, in 1890, he had taken a First in Part II, he started an investigation on " chlorinated phenylhydrazines " at Ruhemann's suggestion and did some demonstrating. In October 1890 he obtained a First in the London degree and in the following spring went to Heidelberg. Here he worked with L. Gattermann on the action of ammonia on quinalizarin.

The " academic freedom " of those days is well illustrated by the fact that in October 1891 Hewitt worked in Cambridge on phenylhydrazines and on citraconfluorescein (the condensation product of citraconic anhydride and resorcinol) and at the end of the May term went to Berlin, continuing his citraconfluorescein research in Tiemann's laboratory. Then, after spending the Michaelmas term demonstrating and doing research in Cambridge, he put in a few weeks in

Heidelberg and took his Ph.D. there in January 1893. The same work, with a little added to it, enabled him to obtain the London D.Sc. in June 1893. He spent the summer working at the Hartley Institute in Southampton and there discovered the first arylazophenol hemihydrates.

At the end of the Lent Term 1894, when he was only 25 years of age, Hewitt applied for and obtained a post as " Professor " of Chemistry at the People's Palace Technical Schools. His teaching duties included twelve hours a week in the Day School and twelve hours a week in the evening classes. J. L. S. Hatton, the mathematician, was the Director of Studies of the evening students and he and Hewitt were an enthusiastic pair. It would be wrong to omit to mention David Allan Low, the engineer, who was Headmaster of the Day School. These three men were largely responsible for the initial development of this centre of learning and research, which later became East London College, a School of the University. Of the three, Hewitt was the active investigator. He soon built up a keen research group which included F. G. Pope (the demonstrator), H. A. Phillips, A. E. Pitt, J. J. Fox, and T. S. Moore. In 1903 Hewitt and Pope were joined by Clarence Smith. Together these three taught and inspired many generations of students, though always Hewitt was the king-pin. He was elected a Fellow of the Royal Society in 1910 and shortly afterwards became a Professor in the University. In 1934, when the College changed its name, Hewitt was made one of the first Fellows of Queen Mary College.

Hewitt had a magnetic personality. When he bustled into the lecture room the pace was set for an hour's concentrated and interesting study of whatever was afoot. Hewitt brought out the best in his students by the example he set : a vigorous man to whom anything chemical was worth while. Considering the size of the chemistry department at East London College in his time, it is extraordinary how many of his students had distinguished academic or industrial or Governmental careers. The writer recalls the following names : S. J. M. Auld, G. M. Bennett, R. K. Cannan, J. C. Drummond, S. Glasstone, J. J. Fox, W. G. Hiscock, J. Kenner, R. W. Merriman, A. D. Mitchell, T. S. Moore, H. A. Phillips, A. E. Pitt, F. B. Thole, and T. F. Winmill, but there may be many more.

In addition to his academic investigations, Hewitt was interested in a number of commercial things. In 1900 or thereabouts he proposed a process for maturing whisky quickly, by treating the raw spirit with the calcium salt of phenylhydrazine-*p*-sulphonic acid, which should remove any furfuraldehyde. A well-known Scotch whisky firm refused the idea since they thought it led to the loss of desirable as well as of undesirable components, but an Irish distillery worked the Hewitt process for some years. The reputation Hewitt had gained as an expert on wines and spirits led to his being consulted by the French wine industry. Hewitt also acquired considerable prestige as a result of acting as an expert witness in the famous Bayer " aspirin " case.

Having been in touch with Germany for a long period, Hewitt was not surprised by the events of 1914. He began some investigations of commercially useful methods of making acetic anhydride and suggested the application of the Jacobsen reaction for the conversion of benzene–xylene mixtures into toluene. In 1915 he was commissioned in the army as " Major, General List, attached Royal Engineers." He and H. R. Le Sueur were sent to the Dardanelles. Here Hewitt seems to have spent his time receiving rather ambiguous instructions : he did water analyses and gave advice about a cargo of chlorine cylinders. He returned to England in January 1916 and was " seconded " to the Ministry of Munitions. In due course he was given the direction of an ex-German laboratory at Chiswick (as he said, suspiciously near certain reservoirs). Here he was assisted by Clarence Smith, W. J. Jones, H. S. Patterson, and W. S. Denham. This group worked on picric acid and later on arsenicals. The post suited Hewitt perfectly, as he had to travel about a good deal and was always in contact with the industrial side of things.

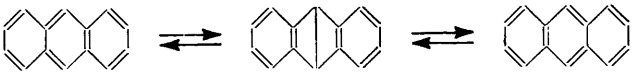
A few months after the Armistice, Hewitt, who had resigned from his professorship and been made an O.B.E., joined with T. D. Morson, C. S. Roy, Clarence Smith, Julian Baker, and Miss Hewitt to form a company to make fine chemicals, the site for operations being Hewitt's latest home (he moved rather frequently), Sutton Manor House, Heston, Middlesex. The company made ethyl chloroformate, quinine ethyl carbonate, quinolines, phenylhydrazine, and other products, but in 1924 became almost obsolescent. Hewitt and his sister moved to a very countrified address in 1928 : Rose Cottage, Hurst, near Twyford. Gas, electricity, water, and main drainage were all lacking, but at the age of 60 Hewitt thought this property to be what he fancied. He built a couple of sheds and so had a laboratory, a library, and a balance room. He did some consulting work and some examining, attended meetings of the Chemical Society and of the Board of Studies in Chemistry in London, and could often be found in the Chemical

Society library reading the journals. He was acutely interested in, but had qualms about, the quantum mechanical treatment of chemical problems.

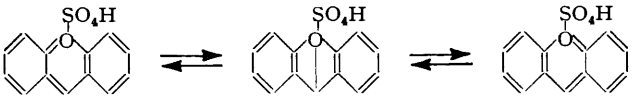
In 1943 his sister died, but Hewitt went on living in Rose Cottage with three cats, and still made his periodic visits to town, as debonair as ever.

Hewitt's earliest original work was on the " hemihydrates " and the " hydrochlorides " of certain hydroxyazo-compounds and on citraconfluorescein. The constitution of the hydroxyazo-compounds was the subject of controversy for about a quarter of a century. There seemed to be some evidence that *o*-hydroxyazo-compounds were quinonehydrazones whereas the isomeric *p*-compounds had true hydroxyazo-structures. Hewitt and his school at East London College attacked this problem in a number of ingenious ways, at first by studying bromination and nitration and later by determining ultraviolet absorption spectra. One of the most important outcomes of these investigations was the development of the idea that depth of colour was related to the length of the conjugated system in the molecule. Closely allied to this was Hewitt's work on fluorescence, which he thought was due to " double symmetrical tautomerism," that is, the oscillation of the bonds between two equivalent structures.

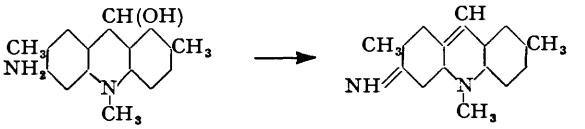
His picture of anthracene :



is no mean fore-runner of the theory of " resonance," and he applied similar arguments to explain, for example, the fluorescence of solutions of xanthhydrol in concentrated sulphuric acid :

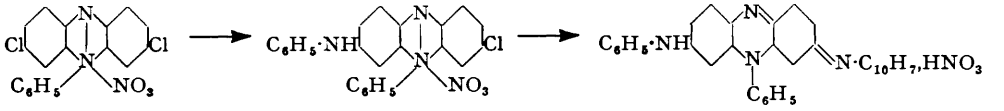


Any coloured substance, and particularly anything that could be used as an " indicator," attracted Hewitt's interest. He published a number of important papers on the relation between carbinol bases and anhydro-bases in the acridine series :



(the benzene rings are as Hewitt wrote them)

The safranines also occupied Hewitt's attention over a number of years : for example, he showed that dichlorophenylphenazonium nitrate reacted with aniline in the cold to give a product which reacted in the hot with α-naphthylamine to give an anilino-naphthylamino-compound :



Hewitt made important contributions to our knowledge of the association of phenols, of the substitution reactions of phenols, and of the constitution of nitrophenols. It is not without interest to note that Moore and Winmill, sometimes credited with the conception of the hydrogen bond, were both Hewitt's students : and no theory could have had a better god-parent.

With Buttle in 1909 Hewitt concluded, from ultraviolet absorption spectra studies, that of the two possible quinonoid forms of the metallic salts of 2 : 4-dinitrophenol the *para* was preferred :

Previously, with Kenner and Silk, Hewitt had observed that whereas three molecular proportions of bromine converted phenol into tribromophenol, one or two molecules of bromine

gave mixtures of phenol with mono-, di-, and tri-bromophenol. It was deduced that the mineral acid produced in the bromination slowed down further substitution and a brilliant conclusion was come to that bromination in presence of sulphuric acid might tend to stop at the dibromo-stage. This was confirmed experimentally. However, even in those days, when there was no authoritarian doctrine about chemical reactions, it was found impossible to apply the ideas to the naphthalene series : α-naphthol with one molecule of bromine gave a mixture of unchanged naphthol with 2 : 4-dibromo-α-naphthol.

Winmill's collaboration with Hewitt resulted in several interesting publications. They showed that the arsenic di-iodide described in the literature was As_2I_4 and not AsI_2 as previously thought, but that it was useless as a source of cacodyls. They also devised an ingenious apparatus for the determination of the surface tension of a compound under its own vapour. They noticed that *ortho*-substituents exerted a steric effect on the association of phenols.

Hewitt's versatility is shown by the fact that apart from the subjects already mentioned, he published papers on natural gas, the Zeisel determination of methoxyl, the synthesis of quinolines, and the by-products of alcoholic fermentation. At the age of 77 he patented a modification of the Skraup quinoline synthesis. Unlike some patents this one works !

There can be no doubt that although Hewitt got a lot out of life he gave to it more. He was an individualist whom even to imitate was to achieve something well above the ordinary. To anyone who has the time (and the knowledge) to reflect, the period during which Hewitt lived was more crammed with chemical adventure than any similar period since time began.

E. E. Turner.