

50-foot span, and four of 30-foot span, as his greatest work. The rails of that viaduct are 150 feet above the River Lugar.

Mr Miller retired from the profession of Civil Engineer in 1850. In 1868 he was returned to Parliament as one of the members for the city of Edinburgh, but lost his seat at the General Election in 1874. He purchased the estates of Leithenhopes in Peeblesshire, and Drumlithie in Kincardineshire, and devoted a great part of his time to improving them. He died on the 8th May 1883.

Mr Miller at the time of his death was Senior Member of the Institution of Civil Engineers, and was elected a Fellow of this Society in 1841.

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#### CHARLES ADOLPH WURTZ.

Charles Adolph Wurtz was born on November 26, 1817, at Wolfheim, in Alsace. He studied at the University of Strasburg, where he completed the medical curriculum by taking the Doctor's degree in 1843. From Strasburg he went to Paris, where he occupied several positions successively, until he became in 1883 Professor at the *École de Médecine*; and in 1866 he was made Dean of the Faculty. In 1867 he was elected member de l'Institut, in preference to Berthelot, who was his only serious opponent. He died on the 12th May 1884, having only three weeks previously pronounced a brilliant and affectionate *éloge* at the tomb of his great master Dumas, whose successor as perpetual Secretary of the Academy he was, on all sides, designated to be.

Few chemists have done more or more remarkable work than Wurtz. His first publication is on the nature of hypophosphorous acid, which he explained; and in the course of his studies on the compounds of phosphorus he discovered the oxychloride. In hydride of copper he discovered the first definite combination of hydrogen with a metallic body. In 1848 he made perhaps his most important discovery, namely, that of the compound *ammonias*, which did so much to assist in establishing the type-theory of his countryman and contemporary Gerhardt. It was extended by his discovery of glycol and the consequent introduction of the idea of polyatomic alcohols. The controversy on the constitution of lactic acid, in

which Wurtz took an important part, had the effect of clearing up the distinction between the *atomicity* and the *basicity* of an acid. In 1855 he discovered the mixed alcoholic radicals by a method which has since become a standard one for the synthesis of hydrocarbons. His researches on *aldol*, a body uniting in itself the properties of an alcohol and an aldehyde, bring us down to the present date.

It would be impossible, in a notice of reasonable length, to give any adequate idea of the importance of the work done by Wurtz during the forty years of his active life of investigation, and it would be equally impossible adequately to appreciate the far-reaching effect which the school which he founded around him has had in the development of modern chemistry. Many of his most illustrious pupils remained to the last workers in his laboratory, influenced by the spirit of enlightenment with which he inspired all who came in contact with him. The personal charm which Wurtz exercised on all who were associated with him cannot be better expressed than in the words spoken at his grave by his distinguished pupil and attached friend Friedel. After extolling his rare powers as a lecturer, he says—"We see him in his laboratory, receiving with unwearying kindness even the humblest of his pupils, interesting himself in his work, and discussing his ideas as with an equal, sowing his ideas broadcast, and as happy and proud of a discovery made by one of his pupils as he was modest and unassertive of his own. Singularly open to new ideas, and afraid of no scientific speculation, however bold, provided it received the sanction of experiment, he was peculiarly fitted to promote the progress of science, and to lead it over firm and solid ground. It was owing to these rare qualities that he attracted so many chemists, both French and foreign, to his laboratory. Of these many in their turn have become masters, and all will unite in saying that the time which they passed in daily association with Wurtz counts amongst the happiest and most fruitful of their lives."