

## In MEMORY

### A.J.P. Martin (1910–2002)

I regret to report the death of A.J.P. Martin on 28 July 2002, following a long illness. Martin was the inventor of partition, paper, reversed-phase, and gas–liquid partition chromatography.

Archer John Porter Martin was born on 1 March 1910 in London. He studied biochemistry at Cambridge University, and during his graduate work he became familiar with countercurrent extraction, which he used to study vitamin E. At the same time, in another laboratory at Cambridge, R.L.M. Synge was investigating the amino acids present in wool. To separate these amino acids, he wanted to use countercurrent extraction but lacked the expertise in the technique, and he was advised to contact Martin. As a result, they teamed together and soon moved to the laboratory of the Wool Industries Research Association, in Leeds, United Kingdom. For some time, they tried to improve countercurrent extraction, but the whole operation was too complicated.

Martin had the idea to improve the system by moving only one phase and keeping the other stationary by coating it on silica-gel particles packed in a glass tube. The sample was injected into the mobile-phase stream flowing through this column; during passage, the individual sample components became separated because of the difference in their partition coefficients and were eluted as separated fractions. This process is how liquid–liquid partition chromatography was born. Martin and Synge published a paper in 1941 that described the technique and presented the theory of partition chromatography, including the theoretical plate concept. For their work, Martin and Synge received the 1952 Nobel Prize in Chemistry.

Partition chromatography in a column enabled the separation of the monocarboxylic amino acids; however, the silica gel used as the support was inadequate for samples that contained dicarboxylic amino acids, which became irreversibly adsorbed onto the support. Searching for a more suitable material, Martin considered cellulose and felt the easiest way would be to use filter paper strips impregnated with the stationary phase and have the mobile phase flow through the paper strip by capillary action. This variant of partition chromatography eventually became paper chromatography and was first described in 1944 by Martin, E. Consden, and A.H. Gordon. Paper chromatography revolutionized biochemical analysis.

In the next period of his professional activities, Martin, who at that time was associated with the British National Institute of Medical Research, further advanced liquid chromatography by developing reversed-phase chromatography and gradient elution in 1950. His crowning achievement was the invention of gas–liquid partition chromatography (now called gas chromatography), which he developed in 1950–1952 with A.T. James. These innovations had a long-lasting influence on the way both gas chromatography and high-performance liquid chromatography are performed today. Through his activities, Martin changed the face of chemical and biochemical analysis — and I might even say chemistry and biochemistry.

Without any doubt, Archer Martin was one of the greatest minds of twentieth-century science. His memory will live forever among the readers of *LCGC* and among the tens of thousands of chromatographers who use his inventions in their daily work.

**Leslie S. Ettre**

*Milestones in Chromatography Editor*