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Obituary: Professor Sir Derek H. R. Barton (1918–1998)

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Professor Sir Derek H. R. Barton
(8 September 1918 – 16 March 1998)

With great sadness I just learned that Professor Sir Derek H. R. Barton died in the evening of 16 March 1998, at age 80.

Professor Barton had been very supportive to our electronic journal, *Molecules* (http://www.mdpi.org /molecules) and served on the Editorial Board from the beginning. He also immediately accepted my invitation to be a member of the International Scientific Advisory Committee of the related conference ECSOC-1 as well as ECSOC-2(The 2nd International Electronic Conference on Synthetic Organic Chemistry, http://www.mdpi.org/ ecsoc-2.htm). He served on the editorial boards of numerous other chemistry journals also. He was the chairman and one of the founding editors of the famous Tetrahedron publications.

Even in recent years, at high age, Professor Barton had been very active in the chemistry community.

He had been invited to many symposia, chemistry seminars, colloquium series, and conference lectures, even in recent years. I have attended his lecture entitled "How to win a Nobel Prize" twice, the first time was at the University of Louisville, USA in 1988, and it was always very stimulating and full of fascinating details.

He had been very active in scientific research even in very recent years as we can find his frequent publication of research papers [1] and always ready to embrace new things such as Internet application in chemistry. We exchanged several e-mails recently. It is a shock that he suddenly passed away.

Derek Harold Richard Barton [2] was born on 8 September 1918, son of William Thomas and Maude Henrietta Barton.

He obtained his B. Sc. Hons. (1st Class) in 1940 and Ph. D. (Organic Chemistry) in 1942, from University of London, Imperial College. After two years in military intelligence and one in industry, he returned to Imperial College to teach inorganic and physical chemistry. He then began an academic odyssey with stops at Harvard, Birkbeck College, and Glasgow.

In 1950, in a brief paper in *Experienta* entitled "The Conformation of the Steroid Nucleus", Professor Barton showed that organic molecules in general and steroid molecules in particular could be assigned a preferred conformation based upon results accumulated by chemical physicists, in particular by Odd Hassel. Thus he established the concept of conformational analysis. He returned to Imperial College as professor of organic chemistry in 1957.

In 1969 he shared the Nobel Prize in Chemistry for his work on conformational analysis.

Professor Barton was knighted by Queen Elizabeth II in 1972 but, by his choice, was known as Sir Derek only in England.

In 1978 he became the Director of the Natural Products Institute at Gif-sur-Yvette in France, and in 1986 he became Distinguished Professor at Texas A&M and held this position for 12 years until his death.

Besides the Nobel Prize, Professor Barton won many honours. More recently, he won ACS Creative Work in Synthetic Chemistry Award in 1989 and ACS Priestley Award in 1995. He was chosen as one of several most influential chemists in the past 75 years of chemical research, by Chemical & Engineering News [3].

Professor Barton has earned his place in chemical tradition the old-fashioned way, with hard work and by inventing reactions. Aside from fathering conformational analysis, his name is associated with at least five organic reactions [4]:

Barton nitrite photolysis – the long range functionalization of alcohols via nitriles leading to gamma-hydroxy oximes;

Barton deamination – free radical deamination of primary amines via isocyanides;

Barton decarboxylation – decarboxylation of a mixed anhydride (thiohydroxamic-carboxylic) and interception of the radicals as a sulfide, selenide or bromo derivative;

Barton-Kellogg olefination – olefin synthesis from hydrazones and thioketones via 1,3,4-thiadiazolines;

Barton-McCombie deoxygenation – of secondary alcohols to hydrocarbons via xanthates;

His recent research interests were the invention of new chemical reactions, the functionalization of unactivated molecules, and the partial synthesis of natural products [4]. His most recent interests can be found at his Website [1].

Professor Barton was first married to Jeanne Kate Wilkins but this marriage was later dissolved. He married again to Professor Christiane Cognet who died in 1994. He has one son, W. G. L. Barton, by his first marriage. Professor Barton is survived by his third wife, Judy Cobb Barton; the son, William, who lives in England, and three grand children [5].

Professor Barton was not only a great scientist, he was also a very kind man, to be remembered by all of us.

Acknowledgements: I would like to thank Dr. Matthew F. Schlecht (DuPont) for his communication and English correction, Professor Emile A. Schweikert (Head, Department of Chemistry, Texas A&M University) for allowing me to use Professor Barton's photo and George D. Merlin McCallion for bringing my attention to the *New York Times* Obituaries section, 19 March 1998.

References and Notes:

1. The Website of Barton group at Department of Chemistry, Texas A&M University: http://www.chem.tamu.edu/brochure/new/faculty/barton/barton.html where the description of his research interests is:

"Although organic synthesis has advanced greatly in the last few decades and is nowadays a multibillion dollar industry, it is still unusual to carry out a reaction with a quantitative yield. There is, therefore, a constant need for new reactions that are more selective and give high yields of single products. Our laboratory is concerned with the invention of such reactions.

A family of high yielding radical reactions has been introduced. These are based on the radical chemistry of the thiocarbonyl group. Important applications in carbohydrate chemistry frequently have given the nearly quantitative yields required. A more recent development has associated the thiocarbonyl group with the relatively weak nitrogen-oxygen bond to provide an efficient system for the conversion of the carboxyl group into a radical. In this way, many synthetic operations can be carried out in high yields, which were not possible before. Applications in peptide chemistry, in steroids, in nucleosides and in other areas of natural products chemistry have been made.

A second interest of the laboratory is in the selective substitution of saturated hydrocarbons. This is an excellent challenge for the present generation of chemists and for Texas. An interesting new approach has been invented for converting saturated hydrocarbons to ketones

smoothly at room temperature. For a 25 percent conversion, the reaction is nearly quantitative. The selectivity is unusual as secondary positions are attacked more rapidly than tertiary centres. In steroid chemistry, a one-step synthesis of progesterone from cholestenone has been achieved.

Recent advances have enabled the conversion of saturated hydrocarbons into a number of secondary derivatives, of which bromides are of significant utility."

2. For the autobiography of his early part of life, visit http://www.nobel.se/laureates/ chemistry-1969-1-bio.html Website of The Nobel Foundation.
3. See the 75th Anniversary issue, *Chemical & Engineering News,* 12 January 1998. Website: http://pubs.acs.org/hotartcl/cenear/980112/ crystal2.html
4. This summary was kindly provided by Matthew F. Schlecht, DuPont Agricultural Products, Newark, DE 19714-0030, USA, tel 302-366-5760 fax 366-5738,Matthew.F.Schlecht@usa.dupont.com
5. The *New York Times* Obituaries section, 19 March 1998. The URL is http://www.nytimes.com/yr/mo/day/news/national /obit-barton.html