

VICTOR A. SNECKUS, JOHN W. AP SIMON & WALTER F. DAVIDSON

Oliver Edward Edwards
1920-2007



Oliver Edward Edwards was born on 8 January 1920 in the Welsh coal mining community of Wattsville, Monmouthshire. His family migrated to Cadomin, Alberta in 1926. His father was a coal mine safety boss and a musician. His mother had been a nurse. In backwoods Alberta, they lived in rough conditions, but had a piano and a violin for their children. He went to Edmonton to finish high school and worked summers at a mine to help pay for his university education. He met a childhood friend Isobel Gregg, while at University and they married in 1945. They had two daughters, Sheryl Anne and Laurel Ruth, and in the fullness of time, nine grandchildren.

According to the family, Dr. Edwards was such a dynamic person, a violinist, with a zest for life that was hard to match. He loved hiking, canoeing, camping and skiing. He inspired his children and grandchildren to pursue education in various fields of science as well as a love of music. He loved the outdoors since his childhood in the mountains near Cadomin, and in particular searching for fossils. Always taking education seriously, he was chair of the Ottawa Vanier "Eastview" school board for a couple of years in the 1950s. His grandchildren remember him through the extensive rock collections he developed with them; the wood carvings he created for each of them; their adventures exploring mountains, streams and every aspect of nature; and as he faithfully instilled a love of life and a well-grounded understanding of art, literature and the global community.

His academic career started with a B.Sc. with first class honours at the University of Alberta in 1941, followed by the M.S. degree (1943) and the Ph.D. degree (1948) at Northwestern University, Illinois. During his doctoral studies (1943-1946) he served in a chemical warfare research unit in the Canadian army, retiring with the rank of Captain.

Among his colleagues, he was generally known as "Ted". Ted was an outstanding organic chemist who, by his painstaking fundamental studies on elucidating the structures of complex molecules, provided outstanding and enduring contributions to both organic chemistry and biochemistry. His perseverance and deep insight were honed during his early research career with Leo Marion, FRS when they deciphered the structures of complex natural products, one of which, notably, was aconitine.

During the two decades following the end of the Second World War, the NRC became an outstanding place for fundamental research. A federal government grateful for the key role the NRC had played in support of the war effort ensured significant research budgets. The arrival of Gerhard Herzberg signaled a new era of research. The highly successful NRC postdoctoral program supplied a steady supply of high quality researchers from around the globe. In short, the NRC laboratories at Sussex Drive in Ottawa turned into a veritable ferment of symbiotic research activity of the highest international caliber. In this environment Ted Edwards was one of the leading scientists.

Starting in 1948, Ted spent his working career in the NRC's Sussex Drive Laboratories, first in the Division of Pure Chemistry and then later as Principal Research Officer in the Division of Biological Sciences, until his formal retirement in January 1985.

Victor Snieckus remembers vividly how stimulating it was to work alongside Ted Edwards.

"Ted was an exciting chemist to work with – the last two words contain much meaning to me because it set the manner in which I worked with students during my academic career:

deemphasize the supervisory role, treat everyone equally in high esteem, and listen to everyone's ideas fairly but critically. At the time of my stay with him, his ideas were flowing much faster than they could be put to experimental test... but that is also a sign of a creative chemist who knows the current literature and who attempts to contribute to it to the best of his abilities.”

Into this research environment at the NRC Ted attracted in the 1960s when he was in his prime some excellent post doctoral students and visitors such as Ian Rae, Ken Wilkins, John ApSimon, and Howard Metee. This relationship stood the test of time developing into camaraderie.

With enthusiasm and insight, Ted drew out plans for the synthesis of aconitine, still characterized as a daunting molecule. He had an incredible visualization in his brain for three-dimensional chemical formulae; he had a deep knowledge and recall of what he had read in the chemical literature; he had a logical mind for the steps that needed to be taken in a complex synthesis. Probably he obtained this gem of a characteristic from his outstanding work with Marion on deciphering the structures of the complex natural products. Ted's daughter Laurel recalls also being fascinated by the molecule models and drawings that covered his desk and the apparatus that covered his bench.

Victor Snieckus remembers distinctly whenever he still tries to attack a new problem in chemistry he envisions Ted standing before him with his inquisitive and sparkling eyes. When he thinks of how to excite students to work harder, he remembers Ted's exquisitely hand drawn chemical structures, Ted's contagious enthusiasm for life, and Ted's dedication to fairness and high moral standing.

Ted was the mentor to John W. ApSimon, a post-doctoral fellow at NRC from 1960-1962, prior to the latter's move to Carleton University where a lifelong friendship and collaboration ensued. Two fruitful summers (1963-64) were spent by ApSimon as a guest worker in Ted's laboratory leading to a number of joint publications.

On his retirement in 1985 Ted was offered a guest position as Adjunct Professor in ApSimon's Carleton University laboratory where he continued research until 2004, when bench work became too difficult. He did continue the writing up of research results after that. Particularly, at Carleton, Ted and ApSimon collaborated on the structural studies of a potent toxic fungal metabolite, fumonisin B1, which turned out to be of key agricultural importance.

But Ted's most important post retirement achievements were his continued love of mentoring younger scientists. In fact that was the only condition ApSimon had on his transfer to Carleton, i.e. “impart your decades of laboratory skills and experience to the undergraduate and graduate students in the Department of Chemistry at Carleton”. For this the princely sum of annual parking was all Ted ever asked for. This Ted did with joy and continual good humour. Ted was in the laboratory daily for a full day working both on his own projects and collaborative ones. There are dozens of graduates who will remember his willingness to help in teaching useful skills and tricks that are needed by the bench chemist.

Victor Snieckus recalls the heady days when he arrived as a NRC post-doctoral researcher in the fall of 1965, quite late, to his embarrassment for not having properly estimated length of time it takes to write a Ph.D. thesis, but with great gratitude to Ted for keeping the position open.

Under Ted's tutelage he worked for a year on aconite alkaloid synthesis without much success but earning great appreciation of Ted's approach to total synthesis of diabolically complex molecules. This unique learning experience shaped his future professional career.

There is a significant history of Ted's work with Leo Marion on isolation and structural elucidation of the aconite alkaloids before 1966 which requires analysis and evaluation.

In 1954, Edwards and Singh published a functional group analysis on atisine, an undertaking prevalent in structural elucidation of natural products before the advent of X-ray crystallographic analysis displaced this mentally stimulating facility that appealed very much to Ted's strength in organic chemistry.

Edwards working with D.C. Gillespie (1966) researched and elucidated the structure of an interesting class of heterocyclic amine oxides (N-Dioxides: A New Class of Amine Oxides). This work showed Ted's knack for logical analysis and accumulation of data in support of structure, the result of extensive abilities in rational structural analysis he had already demonstrated in the alkaloid field.

In 1974 Edwards and colleagues imaginatively employed NMR spectroscopy in an innovative way to characterize the stemphone molecule as a new type of naturally occurring quinine.

A paper published in 1977 on enamide oxidations by Edwards and colleagues, T.G. Back and G.A. MacAlpine, indicated the beginning of his strong interest in acyl azide chemistry, demonstrating a simple but instructive method for the synthesis of oxazines.

The seminal paper in 1982 on "A Partial Synthesis of Aconosine" underpinned one of Ted's greatest strengths: the partial conversion of one alkaloid into a structurally related alkaloid. Ted possessed the ingenuity to make the molecule under study effectively undergo gymnastics, based on biogenetic concepts, to be converted into a derivative molecule. This required deep fundamental understanding of organic reactions and reactivity.

In 1992, while at Carleton University, Ted used thermal and photochemical reactions on steroids as platforms for azido ketone and azide chemistry to create new derivatives which, to date are still unique, and may be profitably studied in new chemistry research.

Ted Edwards' major contributions relate to the painstaking task of elucidating the structures of complex molecules, in particular the aconite alkaloids. He was among those who set the landscape of organic chemistry in Canada that was recognized worldwide. Ted was ingeniously competent in the rational approach of structural determination based on the combination of chemical degradation and appreciation of conformational analysis and NMR spectroscopy. His later work in application of acyl azides and diazoketones provided new reactions of significant synthetic value as well as being modern conceptual contributions which had profound impact on organic synthesis in general.

Ted was a man that inspired energy in all that he took on and in all who knew him. On Ted's death in 2007 a scholarship was established by his friends and family at Carleton University, namely the Dr Ted Edwards Memorial Scholarship awarded annually to an outstanding student

entering the fourth year of a Bachelor of Science program. Preference is given to a student studying Organic Chemistry or Biochemistry.

He was 86 when he finally stopped going to work every day at Carleton. But he wasn't finished yet. He worked at home every day on his last project, the synthesis of the Endod berry molecule. He had to find a way of attaching the third sugar. He persisted until his health failed him in May of 2007. This work was passed to Dr. Tony Durst of the University of Ottawa in the hope that it might prove useful in the extermination of a pernicious and pervasive parasite associated with African snails.

When Ted left the NRC he took with him samples of the natural products and some transformation products that he had isolated, studied or worked on with his mentor Leo Marion. During his last few years at Carleton he asked Tony Durst if he would be interested in preserving them and thereby rescuing them from being destroyed. Ted considered these often unique samples of alkaloids, steroids, tri- and diterpenes many of which were beautifully labelled and stored in small amber bottles with cork stoppers as very valuable, much as a librarian considers an old out-of-press book. Each reminded him of a story which he loved to tell. Durst has been able to catalogue many of them and has made them available as a unique addition to the chemical library of the Ontario Institute for Cancer Research. Perhaps, someday, one of these samples will show unusual activity in a new bio-assay and serve as a lead structure for the development of a new cancer treatment.

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(Authors titles given as of the time of writing)