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A TRIBUTE TO PROFESSOR CLIFFORD A. BUNTON ON HIS 80TH BIRTHDAY

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ABSTRACT

On January 4, 2000 Professor Clifford A. Bunton will celebrate his 80th birthday, over fifty years of contributions to mechanistic organic chemistry and more than thirty years of work on the structure and reactivity of micelles and other association colloids. He obtained the B.Sc. Degree in Chemistry from University College, London in 1941 and the Ph.D. Degree in mechanistic organic chemistry from the same institution in 1944. He remained there as Lecturer and Reader until 1963, when he joined the faculty of the University of California, Santa Barbara,where he is at the present an Emeritus Professor. Professor C.A. Bunton's research work centers on physical organic chemistry of carboxylate and phosphate ester hydrolysis, micellar catalysis, kinetic isotope effects and reactions of ferrocenyl carbocations. He had a large number of students and collaborators from all continents and all corners of the globe and published hundreds of scientific works.

RESUMO

No dia 4 de Janeiro de 2000 o Prof. Dr. Clifford A. Bunton vai celebrar seu octagésimo aniversário, junto com mais de cinquenta anos de contribuições na química orgânica e mais de trinta anos de trabalho sobre a reatividade e estrutura de micelas e outros colóides de associação. Ele obteve o título de B.Sc. em Química no University College, Universidade de Londres em 1941 e o Ph.D. em Química Orgânica Mecanística na mesma instituição em 1944. Ocupou os cargos de Lecturer e Reader na mesma universidade até 1963 quando foi para a Universidade da California, Santa Bárbara como Professor Titular e onde ainda segue desempenhando as suas atividades na presente data como Professor Emeritus. O trabalho de pesquisa do Prof. Dr. C.A. Bunton se concentra na físico-química orgânica da hidrólise de ésteres de carboxilato e fosfato, catálise micelar, efeitos cinéticos isotópicos e reações de carbocátions de ferrocenila. Ele contou com um número grande de estudantes e colaboradores de todos os continentes e todos os cantos do globo terrestre e publicou centenas de trabalhos científicos.

KEYWORDS History of Chemistry, Carboxylate and Phosphate Ester Hydrolysis, Micellar Catalysis, Isotope Effects, Mechanistic Organic Chemistry

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Professor Clifford A. Bunton was born on January 4, 1920 in England.

He obtained the Bachelor of Science Degree in Chemistry from University College, London, where he had various distinguished teachers, among them E.D. Hughes and C.K. Ingold. In 1944 he earned his Doctor of Philosophy Degree in Mechanistic Organic Chemistry from the same institution.

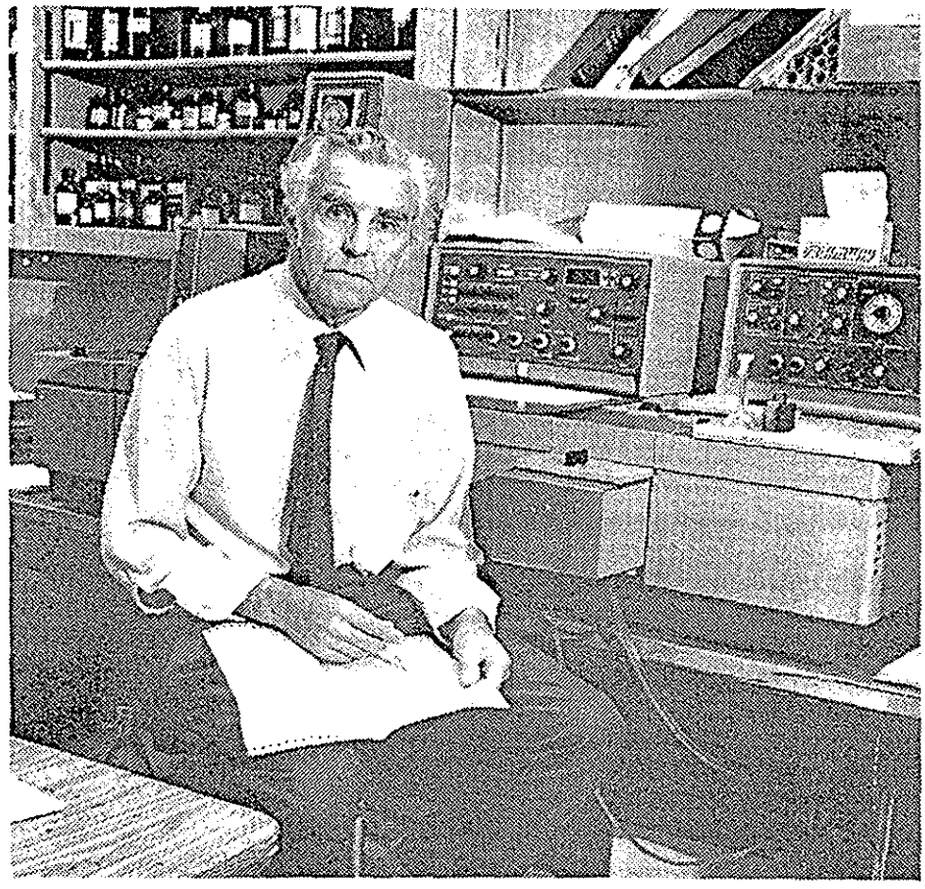
Dr. Bunton remained at University College, London as Lecturer and Reader until 1963. During parts of 1961 and 1963, he occupied positions as Visiting Lecturer at the University of California at Los Angeles and Visiting Professor at the University of Toronto, Ontario, Canada.

In 1963 he joined the faculty of the Chemistry Department of the University of California, Santa Barbara as Full Professor, a position that he held until his official retirement on May 26, 1990. On that occasion, he was honored by friends, former students and associates with a symposium entitled "*Quantitative Treatment of Organic Reactions in Solution*" that included very distinguished invited speakers, among them Joe Bunnett(University of California, Santa Cruz), Janos Fendler (Syracuse), Keith Inglod (NRC, Ottawa), Fred Menger (Emory University, Atlanta, Georgia), Larry Romsted (Rutgers University,Piscataway, N.J.) and Jack Shiner (University of Indiana, Bloomington). His formal retirement in no way hindered his scientific investigations and he continues to be very active in research as an Emeritus Professor.

During his 27-year tenure as Professor at the University of California, Santa Barbara, Dr. Bunton participated of a wide number of committees at the departmental, university, state and national levels. He was a member of the Graduate Committee, Building, Storeroom, General Education, Science and Engineering Library and Educational Policy Committees. He served as Chairman of the Science Policy Committee for the University of Chile/University of California Cooperative Program for many years. From 1967 to 1972, Dr. C. A. Bunton served as Chairman of the Chemistry Department. Together with Professors Bruce Rickborn, Glyn O. Pritchard and Thomas C. Bruice, he may be considered as one of the pillars of the Chemistry Department of the University of California, Santa Barbara.

In recognition of his outstanding research, he was named UCSB Faculty Research Lecturer. He has been the recipient of numerous fellowships and plenary lectureships. Dr. Bunton is a member of the Chemical Society (London), Institute of Chemistry and the American Chemical Society. He served as referee and was part of the Editorial Board of many journals throughout the world and also acted as referee for the Petroleum Research Fund and most Federal Granting Agencies.

Professor C.A. Bunton's research work centers on the physical organic chemistry of carboxylic esters and phosphate ester hydrolysis, micellar catalysis and reaction of ferrocenyl carbocations. He has a continuing interest in models for biological reactions, mechanisms of oxidation and the use of isotope tracers in the study of reaction mechanisms.



PROFESSOR DR. CLIFFORD A. BUNTON

His work on micellar catalyzed reactions provides a glimpse into the approaches that he has taken in terms of scientific investigations during a period of continuous effort that spans more than half a century.

Micelles were used as models for a variety of interfaces from membranes to enzyme active sites. His early work explored the effect of micelles on a wide range of reactions including spontaneous decarboxylations, acid catalyzed acetal hydrolysis, the benzidine rearrangement and aromatic nucleophilic substitutuion besides reactions of carboxylate and phosphate esters.

Later, Professor C.A. Bunton worked on kinetic models that led to quantitative interpretations of micellar effects on rates and equilibria and on probes of micelle structure that led to a better understanding of the aqueous interface.

On the more practical side, he opened the pathway for the use of functionalized micellar solutions for detoxifying people poisoned by organophosphate pesticides and nerve gases. During the period beginning in 1963 and up to very recent times Prof. C.A. Bunton had ample financial support from the Petroleum Research Fund, the National Science Foundation, National Institutes of Health, the United States Army Office of Research and other U.S. Granting Agencies.

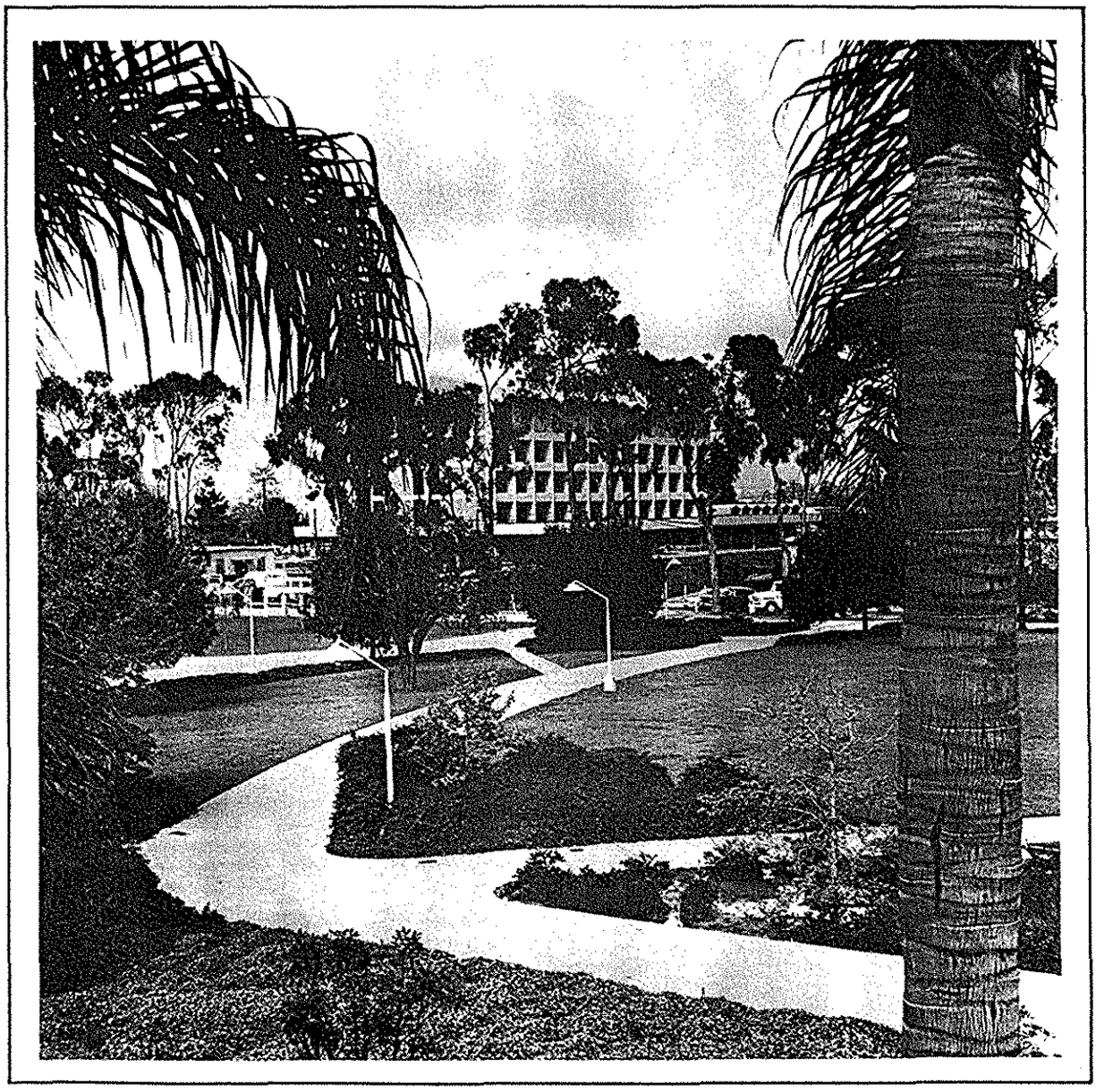
We had the privilege to work and collaborate closely with Professor C.A. Bunton on two occasions.Firstly, as a Postdoctoral Fellow during 1971-72 and secondly during 1982, while a Visiting Professor at the University of California, Santa Barbara.

Professor C.A. Bunton is a very kind, fair, considerate and hard working person and has always treated others with respect and dignity. He is called "*Bunny*" by his close friends and associates. Among his hobbies are sailing, mountain climbing and jogging. He is an excellent connoisseur of wines. During his frequent trips to Chile, where he was always treated with admiration and respect, besides the hard work opening the frontiers of chemistry, he used to do a lot of mountain climbing in the Cordillera of the Andes. During the noon hour, at times he used to go jogging on the beach in Isla Vista or Santa Barbara with friends. Among his most frequent companions was Glyn O. Pritchard, a physical chemistry professor at UCSB. When he was not jogging, he used to eat lunch in his office and spend the rest of the noon break reading journals.

Professor C.A. Bunton used to make two daily rounds in the laboratory, one around 10:00 am in the morning and the other during the latter part of the afternoon , about 4:30 or 5:00 pm and enjoyed discussing and analyzing new experimental results with his students and collaborators. One of his graduate students, who was a little bit absent minded, could not obtain the desired product in a synthesis after various attempts. All people in the laboratory were puzzled, only to discover days later that the fellow had forgotten to to add one of the reagents. On another occasion, a postdoctoral fellow that was working with cyanide wanted to order a few kilograms from a supplier. Dr. Bunton remarked that with that "*bloody quantity he could kill all the people in Santa Barbara*".

He also liked to talk about politics. He was no fan of Ronald Reagan, then Governor of the State of California, a fellow who trimmed the budget of the University of California and distributed significant sums to the state colleges.

His typical greeting was "*How is it going?*". The greeting actually had two meanings and it required two different answers. The first one is obvious and had to do with one's well being. The second one was really an implicit question about new experimental results that were obtained during the day. It was a very elegant way to remind one of his responsibility and at the same time stimulate productive research activity in the laboratory.



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During our first stay in Santa Barbara as a postdoctoral fellow, Isla Vista, where the campus of the university is located was also one of the national headquarters of the Hippie Movement. Public disturbances were rather common as was the use of tear gas by the California State Police. The burning of the branch of the Bank of America and its rebuilding in a "bunker style" in the center of Isla Vista is part of the Hippie Legend. One night, a public protest against the Vietnam War turned into a riot and Isla Vista was saturated with tear gas. We did not sleep all night and cried a good part of it. Early in the morning we went to the Laboratory on the Campus where there was a smaller concentration of tear gas. For some good reason, Dr. Bunton came a little bit earlier and began his morning round with his usual greeting: " *How is it going ?*" We answered that we were not going very well because of the riot and the tear gas , that the eyes were red that we did not sleep all night and cried a good part of it and did not say anything about the new experimental results that we had botained. Professor Bunton listened carefully, shook his head and then patiently said again: "*But I mean how is it going?*". We than had an interesting discussion and made a good analysis of the fresh experimetal results.

Throughout the more than fifty years of continuous hard work, Professor Clifford A. Bunton had a large number of students and coworkers from all continents and all corners of the globe, probably more than two hundred of them.

His formal collaborations were manily with the University of Chile, Santiago, the University of Perugia and the University of Rome in Italy and the Universidade Federal de Santa Catarina and Universidade de São Paulo in Brazil. He treated all his students and coworkers as friends and many of them remember with pleasure the Christmas parties and the dinners offered in their home in Santa Barbara by Dr. and Mrs. Bunton.

Professor C. A. Bunton is the author of a very large number of scientific publications and received a large number of awards, prizes and distinctions and no attempt will be made to enumerate them at the present. He is a Member of the Brazilian and Chilean Academies of Science, Doctor Honoris Causa of the University of Perugia, Fellow of the American Association for the Advancement of Science and Recipient of the Tolman Medal. He is a very prolific scientific writer and has published almost five hundred scientific articles. We shall list ony a few representative publications at the end of this homage.

On the occasion of his 80th birthday (January 4, 2000) we pay our modest tribute to Professor Dr. Clifford Allen Bunton as a scientist, teacher, colleague and friend and congratulate him for all the accomplishments that he has achieved during more than half a century of effort, hard work, diligence and good will. We convey him the best wishes of good health, happiness and success for the days to come.

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