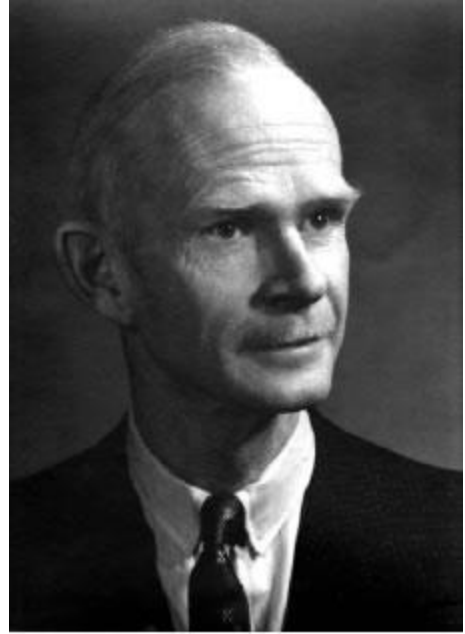


## Anthony Brown (1911-2005)

Anthony Brown, known to friends and colleagues as "Tony", died at Morges, Switzerland on 17 February 2005 in his 94th year. By virtue of his intellectual abilities and disciplined work ethic he enjoyed a distinguished career as an entomologist, researcher, teacher, professor/administrator and as a consultant at home and abroad on the control of mosquitoes and insect vectors of diseases. He served Canada and his discipline with distinction and was awarded an MBE in 1946 for his wartime service in defence research and was elected a Fellow of the Royal Society of Canada in 1961.

He was born in England at Horley in Surrey 18 November 1911 where he obtained his formal schooling culminating in a classical education at Winchester College 1925-1929. Tony emigrated to Canada at age 17 and entered Trinity College at the University of Toronto. Academic life posed no difficulties for him as he was an excellent student. On the other hand supporting himself during the Depression with limited financial resources was not easy but he managed to obtain support from adventurous summers spent "riding the rails" across the Prairies and along the way obtaining farmwork. For all his life thereafter Tony worked hard for all his goals and this paid off in accomplishment doing the science he enjoyed.



The basis for his lifelong study of insect physiology and applied entomology was established by his doctoral studies in the Department of Biochemistry, University of Toronto, where he gained his PhD in 1936 for an investigation of nitrogen metabolism in flesh-flies. He continued this work in the UK in 1936-37 at the London School of Hygiene and Tropical Medicine where he worked in the laboratory of Sir Vincent B. Wigglesworth and was supported by a Research Fellowship from the Royal Society of Canada. He returned to Canada to become Sessional Lecturer in Entomology at Macdonald College, McGill University. In 1938, he accepted a position with the Canada Department of Agriculture where he was appointed as Assistant Entomologist and served as the Director of the Forest Insect Survey in the Gatineau River region of Quebec from 1938-1942. Throughout this period he maintained a broad interest in nature through his service as Editor of the Canadian Field-Naturalist from 1939 to 1942. At that time Canada's involvement in WW II had advanced to include a Directorate of Chemical Warfare in association with the Department of National Defence and the National Research Council; this national effort had by 1941-42 become engaged with their British counterparts in the formation of the Suffield Experimental Station for research in "Chemical Warfare and Smoke" and other matters of military significance including biological warfare and insect vectors of diseases. At this time he joined the Canadian Army as Lieutenant and was assigned to the Department of National Defence where he subsequently rose to the rank of Major in the Directorate of Chemical Warfare (Defence Research Board). He was appointed Head of the Entomological Section of the National Defence Experimental Station in Suffield, Alberta in 1945 where he remained until 1947. With this experience and knowledge of worldly problems, it is not surprising that he became involved in field studies and the application of his knowledge and skills to solving insect control problems in far off places, such as Sudan, where he acted on behalf of the World Health Organisation.

In 1947, Detwiler at the University of Western Ontario persuaded him to join the Department of Zoology as Associate Professor to undertake entomological research and teaching. There is reason to believe that this relatively senior scientist was hired because of his potential, as he was appointed Head and Professor of Zoology in 1949 on the retirement of Detwiler, a position he would hold until 1968. This initiated a new and active phase of his career in which he took his responsibilities

seriously: he became known for encouraging excellence in teaching, developing the strengths of the Department with quality appointments, encouraging the research careers of his colleagues, being productively involved himself in research, and in writing papers and books. The people he worked with at the time remember him as a patient and helpful senior colleague with a strong sense of what the Department was about and what was needed for success. He strongly believed in the principle that individual faculty members should have complete freedom in determining what was included in their courses and how they were taught. His work with insects attracted much attention and served to put the Department of Zoology 'on the map', the result being that the Department of Zoology was one of the first in the University to welcome a large and diverse group of international students.

During his time at UWO his research shifted significantly from insect biochemistry and physiology, especially nitrogen metabolism, to problems involving the attraction of biting insects to human subjects, mechanisms of pesticide action, the ever increasing problem of pesticide resistance, and the use of pesticides in forestry, agriculture, and the control of insect vectors of human diseases. This shift must have been stimulated in part by his army responsibilities concerning troops in areas noted for malaria, dengue fever and the like. These activities are reflected in his papers and particularly in the titles of the books and reviews he wrote in the 50's and 60's: *Insect Control by Chemicals*, *Medical and Veterinary Entomology*, *Insecticide Resistance in Arthropods*, *Mechanisms of Resistance against Insecticides*, and *Factors in the Attractiveness of Bodies for Mosquitoes*. One of the most significant scientific contributions by the Brown lab was the clear demonstration of the genetic basis of insect resistance to insecticides. Brown's research team was the first to identify the chromosomal loci responsible for DDT- and cyclodiene-resistance. Another significant contribution was the use of biochemical studies to determine the mechanism of insecticide resistance. His group was the first to identify the altered carboxylesterase responsible for malathion resistance in several species of mosquitoes. This effort is regarded as one of the earliest studies to employ biochemical genetics and molecular biology techniques for the investigation of insect resistance against insecticides. He was an authority and sought as such by the World Health Organisation who accorded him the position of Biologist while he was on special leave of absence 1956-1958. Following that period in Geneva he returned to the University to continue his researches on toxicity and repellancy of various organic compounds and the resistance of many insects to insecticides then in use. This was the beginning of wider associations and many other consultancies were the result, including the US Public Health Service.

After leaving UWO in 1968 he joined the World Health Organisation where he became Head of the Vector Ecology Section in Geneva, Switzerland. He served in that position from 1969 to 1973 when he was appointed Director of the Pesticide Research Center at Michigan State University and John A. Hannah Distinguished Professor. He was now in the enviable position of having a dedicated research group and more freedom for consultancy on a world scale. This enabled him to expand his interests in the ecology of pesticides and to take advantage of his experience in field problems of choice, distribution, and tactics relevant to large-scale insect control involving aerosols, aircraft, natural features such as rivers, and more. He retired from Michigan State University in 1976 as the John A. Hannah Distinguished Professor Emeritus.

His scientific career brought many honours including the MBE (military) for his wartimeservices. He was elected a Fellow of the Royal Society of Canada in 1961 and was awarded the Entomological Society of Canada Gold Medal for Achievement in 1963. He was elected President of the Entomological Society of Canada (1962), the American Mosquito Control Association (1965), the Entomological Society of America (1967), and the Canadian Society of Zoologists (1968). He was made a Fellow of the Entomological Society of Ontario (1969) and held honorary membership in the Entomological Society of America.

In June 1938, following his year at Macdonald College, he married Jocelyn Evill in London, England. They returned to Canada and made their home in Ottawa during his years with Canada Agriculture

and the Army service and subsequently in Suffield, Alberta and then in London, Ontario and East Lansing, Michigan. It was at that time that Tony and Jocelyn built a summer cottage on Dwight Bay of Lake of Bays where they spent many happy summer vacations and other occasions with their three daughters (Hilary, Virginia and Kathryn). In home or cottage they welcomed friends and visiting colleagues and were generous, lively and amusing hosts for guests of all ages. Those meeting with them at the lake gained the fruits of Tony's experience as a forester and naturalist which added much to every visit. On retirement they moved to Switzerland, which was more than reasonable considering their many long and short visits to that country and his continuing association with the World Health Organisation after their move. They enjoyed the countryside and the mountains, including skiing in their younger years, and the relative proximity to colleagues and friends in the nearby countries of western Europe. They settled down in the village of Genolier in the Canton of Vaud, about half way between Geneva and Lausanne, in a house with an elegant prospect and in a countryside full of vineyards.

It was a fulfilling, varied and interesting life from beginning to end; a good friend and colleague at every stage of it.

— John Steele London, Ontario University of Western Ontario