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## OBITUARY

# Colin G Butler, MA, PhD, FRPS, FIBiol, OBE, FRS (1913–2016)

Norman L Carreck 

Dr. Colin Gasking Butler, former Head of the Bee Department at Rothamsted Experimental Station, UK, died peacefully on 4 January after a short illness, at the age of 102. He is credited as the discoverer of “Queen Substance” now known as Queen Mandibular Pheromone.

Colin Butler, the son of a school teacher, was born at Horsham, Sussex on 26 October 1913. He was educated at Monkton Combe School, Bath, and at Queens’ College, Cambridge. After graduation, he became Superintendent of that University’s Entomological Field Station, researching whiteflies and locusts, while teaching at the University. In 1939, he joined the Bee Section of the Entomology Department at Rothamsted Experimental Station, Hertfordshire, which had been carrying out bee research since 1922. In 1944, during the Second World War, government recognition of the value of bees in increasing the blockaded nation’s food production led to the establishment of a separate Bee Department, with Butler as Head. He remained Head until 1972 when it merged with the Entomology Department, which he also headed. He retired in 1976 (Figure 1).

Butler presided over an incredibly productive golden period of bee research at Rothamsted. With strong government support, he instigated many novel research programmes, and worked with such figures as Leslie Bailey, Brenda Ball, John Free, Ronald Ribbands, James Simpson and Ingrid Williams (Figure 2). Under his charge, the bee research at Rothamsted grew from a “Bee Section” of the Entomology Department consisting of five or six staff to an independent “Bee Department” with over 20 staff.



Figure 1. Colin Butler at the time of his retirement.

Note: Photo: Rothamsted Research.

A full account of his period at Rothamsted and the achievements of the Bee Department are given in the two articles published in *Bee World* to commemorate the 150th anniversary of the founding of Rothamsted Experimental Station (Williams, 1993; Williams, Ball, Tomkins, & Carreck, 1993). The list of Butler’s papers published in IBRA journals in the bibliography below demonstrates the breadth of his interests.

His primary area of study was bee behaviour, and led to the work of James Simpson on the causes and control of swarming in honey bees. In 1946, Butler travelled to the USA, to learn the newly developed technique of instrumental insemination of queens and to visit bee research institutes there. With others he began pioneering studies of pheromones, in particular with James Simpson and Robert Callow on the discovery and synthesis of what is now

known as Queen Mandibular Pheromone. He and his wife Jean developed a friendship with Brother Adam at Buckfast Abbey. Brother Adam supplied Butler with surplus queen bees to help provide the vast numbers needed for pheromone extraction, given the insensitivity of the analytical techniques available at the time.

The work on queen pheromones had immediate practical benefits for beekeepers. Understanding of the queen’s role led to improved queen-rearing techniques and methods for the successful introduction of queens into colonies. The “Butler cage”, used throughout the world, is a simple cage made of wire mesh, yet the precise size of the mesh, which allows workers to feed the caged queen but not to harm her, was only concluded after much experimental work. Further work on bee pheromones by John Free, Ingrid Williams and John Pickett led to the development of a “swarm lure” derived from Nasanov pheromone.

Following extensive colony losses that had occurred due to foulbrood during the First World War, Butler was closely involved in drawing up the “Foul Brood Disease of Bees Order 1942”, the first bee disease legislation in the UK, and Rothamsted assumed sole responsibility for bee disease inspection, a role now undertaken by the Animal and Plant Health Agency at York. The extensive body of work on bee pathology, particularly on bee viruses, by Leslie Bailey and Brenda Ball built on this early work.

Butler instigated work on pollination in the 1940s with studies on the pollination of red clover, with the aim of increasing food production. This led to the later work completed by John



Figure 2. The Rothamsted Bee Department, 1957.

Notes: L to R: Standing: James Simpson, Norman Ellement, David Lee, Bill Stevens, Tony Griffin, Fred Woodstock, Ron Welch, Peter Tomkins. Seated: Valerie Bramley, Leslie Bailey, John Free, Colin Butler, Lorna Stevens, Inge Riedel, Yvette Spencer-Booth. Photo: Rothamsted Research.



Figure 3. Rothamsted field work in the 1940s.

Notes: Queenie Sangster and Beryl Thorne are marking bees and timing flights, showing the low-tech nature of the equipment used. Photo: Rothamsted Research.

Free and Ingrid Williams, not only on the pollination of many agricultural crops, but also on the wider implications of insect pollination ecology and bee conservation.

Also in the 1940s, Butler instigated work on the poisoning of bees by agrochemicals, notably the toxic effects of arsenic compounds applied to fruit trees. Work on newer compounds showed, for

example, that DDT was relatively benign to bees compared to older compounds. This led directly to the work of John Stevenson and others in developing the first protocols for testing the harmful



effects of pesticides on bees, a subject very much in the news today.

Having talked to a number of people who worked with him, it is clear that Butler was a scientist of “the old school”, believing in a strict hierarchy of “scientists” (who wore white lab coats), “ladies” (who wore blue lab coats) and “assistants” (who wore brown lab coats). At a time when science in Britain was in receipt of generous public funds, and other departments at Rothamsted were investing in the latest high-tech equipment such as electron microscopes and computers, Butler was notoriously economical, and much experimental equipment in the Bee Department was made by the apiary staff out of wood, Meccano (a model construction set with metal plates, wheels and connectors), string and sealing wax (Figure 3). Apparently, in order to obtain a new pencil from the stationary cupboard, staff had to personally show the Head of Department the worn-out stub of the old one before a new one would be issued!

Colin Butler served on the Council of the (then) Bee Research Association from 1960 to 1967, and took a keen interest in formulating the Association’s policy. He published a number of papers in the *Journal of Apicultural Research*, and many papers, notes and letters in *Bee World* (see bibliography below), including popular articles summarising the results of many scientific papers published elsewhere. He was also responsible for two volumes in the popular Collins “New Naturalist” series, *The world of the honey bee*, which was reprinted a number of times and translated into several languages, and (with John Free) *Bumble bees*. Both are still highly prized by collectors today. Butler was a keen photographer, and also frequently appeared on radio and television talking about bee research. He collaborated with C.P. Abbott in the making of a number of films on bees and bee research, which are today a fascinating record of his period at Rothamsted.

On retirement Butler and his wife moved to Cornwall to enjoy his hobbies of fishing and sailing, but later moved to a village near Cambridge to be near their family. During the 1960s,

Butler served as Treasurer of the Royal Entomological Society, and then as President in 1971–72. He was president of the International Union for Study of Social Insects from 1969–73, a member of the National Trust Regional Committee for Devon and Cornwall, President of the Cornwall Naturalists Trust and an Honorary Member of the British Beekeepers’ Association. He was elected a Fellow of the Royal Society in 1970 and awarded the Order of the British Empire.

We send our condolences to his family.

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