

Obituary

In memoriam: Ernest John Christopher Polge (1926–2006)



Chris Polge, a founding member and active participant of the *International Conference on Boar Semen Preservation*, died on 17 August 2006 at the age of 80 years and 1 day. Ernest John Christopher Polge was the son of a Buckinghamshire farmer, where he no doubt developed his interest in the application of new discoveries to animal agriculture. He took an agriculture degree from the University of Reading in 1946 and a PhD from the University of London in 1955. While a doctoral student at the National Institute for Medical Research at Mill Hill, he solved a problem of long standing interest—how to preserve living cells and tissues at cryogenic temperatures while preserving their functionality. This discovery, in collaboration with his mentors, A.U. Smith and A.S. Parkes, is recorded in an article in *Nature* in 1949 [1]. This finding spawned the new science of Cryobiology. Chris saw the importance of the discovery for the cattle industry and soon turned his attention to bull sperm. This work, published in 1952

[2], established frozen semen as an effective means of producing offspring in cattle. He was invited to numerous bull studs and research institutes worldwide to demonstrate the new technology. These momentous scientific breakthroughs led to production practices built on freeze preservation of sperm and embryos that form the basis for the livestock reproduction industry, as we know it today.

Dr. Polge recounted numerous times the story [3] behind the discovery that has been so instrumental to the development of cryopreservation in animal and medical science. As Chris would tell it, he was seeking to repeat the observation on the effect of low temperature on fowl sperm that had been exposed to strong solutions of sugars. He was focusing on fructose and had no success. After a several month hiatus and the relocation of his laboratory to a field station, he resumed his experiments with the old stock solutions and found that he could get sperm survival after freezing at -79°C . Soon it came time to make a fresh stock solution, and upon using it he failed to obtain sperm survival. After several frustrating attempts to get survival with the new solution, he gave the remaining “old” stock solution to a chemist who after some effort to identify it, passed it through a flame and recognized the characteristic smell of burning glycerol. An analysis showed that it contained a high level of glycerol, no reducing sugars, but a high level of protein. Based on that, he assumed that what had happened was that the labels on various bottles in the refrigerator had become “muddled up” so that the label on the fructose stock had somehow been exchanged with the one for a solution of glycerol and egg white (Meyer’s egg albumen), that was also being used in the laboratory for histological work at that time. Chris wrote “it was the case of chance playing a big part in experimentation [3].”

A review of research firsts from the Polge laboratory at Mill Hill, and mostly at the Animal Research Station

at Huntingdon Road, Cambridge is illustrative of his “cutting edge” research accomplishments. It is important to recount those “firsts” of offspring produced from frozen semen: chicks: 1949 [1] and 1950 [4]; calves: 1952 [2]; and piglets: 1970 [5]; and from embryos: calves: 1973 [6], lambs: 1976 [7], and mice: 1972 [8]. In addition to these firsts, there was an abundance of other “cutting edge” research undertaken in his laboratory by students and visiting scientists. Significant advances were made in the areas of cloning, embryo splitting, twinning, chimerism, in vitro fertilization, synchronization of estrus, production of transgenic animals, and AI of swine, to name only a few. Chris was fond of pointing out that the pig was his favorite animal. He began research with the pig early in the 1950s and his report that he achieved a 60% conception rate in sows after AI in 1956 was a breakthrough of sorts for that time period [9].

The Polge laboratory was clearly the premier place to visit, or to come to, in order to conduct research on the most important questions in animal physiology from 1955 to 1985. A high number of these colleagues are well known leaders in reproductive science around the world. Chris led the Animal Research Station for 8 years prior to the closing of the Huntingdon Road location in 1986. He then co-founded Animal Biotechnology Cambridge Ltd., a start-up company where he continued to pursue his research interests, consistent with his philosophy of translating research advances into commercial application. An example was to use sexed semen for IVF to produce embryos that were then frozen and thawed and transferred to beef cows on farms to produce the first calves (90% of the desired sex) from embryos fertilized with sexed semen [10].

Chris Polge, whose accomplishments spanned more than 50 years, became a world authority in animal reproductive science with few peers. Yet, he remained a modest and unassuming man. He was the recipient of many significant awards and honors, among them the prestigious 8th Japan Prize for Science & Technology, The Wolf Foundation Prize in Agriculture (Israel); Elected – Fellow, Royal Society and – Foreign Associate, U.S. National Academy of Science; Commander of the British Empire, CBE; Pioneer Award, International Embryo Transfer Society; The First Bertebos Prize, Sweden; and Honorary doctorates from

the University of Illinois and from the University of Guelph. He was active in various national and world science organizations established for the advancement of science, especially in reproduction.

Chris’s infectious enthusiasm for scientific discovery, and his inquisitive intellect, infected all who knew him. Everyone who heard him speak, teach, instruct, or participate in scientific meetings learned and benefited from this man who was as comfortable and pleasant talking to the movers and shakers of the world, as he was talking to the newest graduate student. Many of his colleagues from around the world have experienced the gracious hospitality of Chris and his wife Olive, where homemade soups and breads were a Chris Polge specialty. Chris is survived by his wife, Olive of 52 years and four children, all of whom chose science careers (a dentist, a medical doctor, a physiotherapist, and a PhD in plant science) and nine grand children. Chris was a warm and trusted friend to all who knew him and is greatly missed.

References

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