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The work of the Animal Research Station, Cambridge

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Abstract

This paper traces the history of the Animal Research Station, Cambridge from its establishment in 1932 to its closure in 1986. The author worked there for forty years and was Director from 1979. Originally set up as a field station for Cambridge University's School of Agriculture, the Station was expanded after World War II as the Agricultural Research Council's Unit of Animal Reproduction. Beginning with semen and artificial insemination, research at the Station soon embraced superovulation and embryo transfer in farm animals. Many other technologies were also developed here, including IVF in pigs, cloning by nuclear transplantation of early embryonic cells, and the first genetically modified farm animals in Britain. This account recalls the Directors of the Station and their research teams together with details of their pioneering contribution to reproductive biology.

Keywords: Agriculture; Reproductive technology; Cambridge; Artificial insemination; Embryo transfer; IVF; Cloning

I want to give an account of some of the work of the Animal Research Station in Cambridge because, during the fifty years of its existence and although it was relatively small, it had a huge impact on the development and application of reproductive technologies in animal breeding. Some of these technologies also led to clinical applications. I had the good fortune to work at the Research Station for forty years.

It was established in 1932 on a corner of the University Farm on the Huntingdon Road as a small field station for the University's School of Agriculture in order to provide more facilities for the work on animal reproduction of F. H. A. Marshall, John Hammond and

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Arthur Walton. Marshall was a Reader in the School of Agriculture in the early 1900s. Apart from being a distinguished reproductive physiologist himself, his great legacy was to write the first edition of his book *The physiology of reproduction*. This drew together most of the existing knowledge on reproductive biology and for the first time established it as a branch of physiology in its own right. For many years his book was the 'Bible' for reproductive biologists.

John Hammond was first a student of Marshall's and then worked with him on subjects such as the oestrus cycle. Later he became one of the greatest agricultural scientists of the twentieth century and did more than anyone else to apply science to the improvement of animal production. This involved work on both reproduction and growth. I only knew Hammond in the later years of his life, but I remember him as a tall, somewhat stooping figure and he nearly always had a cigarette clamped in his mouth. He was an affable person who wore rather dishevelled suits. These he had specially made with capacious pockets inside the jacket in which he could carry two-pint bottles containing specimens that he collected from the Research Station. He then cycled on his tall, upright bicycle back to his laboratories at the School of Agriculture. In fact he never learned to drive a car. He had tremendously broad interests in animal breeding, meat production and meat quality. He communicated easily with farmers as well as with scientists and was a well liked and much respected person in both communities. He had a large number of students, mainly from overseas, and many of these later became leaders of research in animal production in their own countries.

Hammond had a great interest in the development of artificial insemination (AI) in farm livestock. Some of his earlier experiments were in horses. There is a story of him cycling from the Nutrition Laboratories on the Milton Road, where he worked before the Research Station was built, to the University Farm with a vial of stallion semen strapped under his armpit to keep it warm. There he inseminated some mares, but probably with little success. Later he used AI very successfully to undertake reciprocal cross breeding between Shires and Shetland Ponies to study effects of uterine size on foetal growth.

Arthur Walton joined Hammond in the 1920s and worked on the development of technologies for AI especially in cattle and sheep. He designed artificial vaginas for the collection of semen and equipment for AI. Some of these were based on Russian designs where development of AI in farm animals was more advanced than elsewhere. He himself visited Russia in order to study and report on their progress. He had a particular interest in the improvement of media for the storage of semen and in prolonging viability of sperm in vitro by cooling.

In the late 1930s both Hammond and Walton did all they could to try and persuade the Ministry of Agriculture to support practical development of AI in cattle breeding. But their pleas fell on stony ground. Objections were raised principally by pedigree bull breeders, who feared AI would ruin their business, but also by religious organisations on moral grounds. It was not until attacks on shipping in the Atlantic during the Second World War were causing major food shortages in Britain, that support was given to start AI. Hammond said that the then Minister of Agriculture, James Hudson, came to Cambridge and asked him 'look here, what can you scientific chaps do for us to increase home food production?' Hammond had no hesitation in replying 'establish AI in cattle breeding to increase national milk production'. And so it was that the first AI Centre was started at Cambridge in 1942. The technology was highly successful and soon led to a phenomenal