IN MEMORIAM

Robert Royston Amos (Robin) Coombs

Robin Coombs, the renowned Cambridge University immunologist, who in the 1940s devised the critical diagnostic test that bears his name, died on January 25, 2006, after a long illness. He is the last survivor of the distinguished group of British immunologists who were responsible for the renaissance of British immunology after the Second World War.

Robert Royston Amos Coombs was born in London, January 9, 1921, and grew up in Cape Town, South Africa. He returned to study veterinary medicine at the Royal Veterinary College, Edinburgh, Scotland. It was while working at the Veterinary Research Center, Weybridge, England, on the serodiagnosis of glanders, a horse disease caused by Burkholderia mallei infection, with the sensitive serodiagnostic test, the complement-dependent conglutination reaction, and reading the early immunologic literature about this reaction that he became interested in immunology (particularly in antibodies and red cells).

In 1944 he went to Cambridge University as a PhD student in the Department of Pathology, where he remained until his retirement in 1988. Soon after obtaining his PhD in 1947, he became assistant director of research, and in 1966, became the Quick Professor of Biology. He was the prime mover in the development of clinical immunology, developed new critical tests, and trained many of the world’s leading immunologists. He was the author of 299 scientific papers and three books. He retired in 1988 and spent the rest of his life in Cambridge. He was a Stringer Fellow at Kings College and later a Fellow at Corpus Christi College.

During the Second World War, Professor R.A. Fisher’s Galton Laboratory Serum Unit of the National Medical Research Council was relocated to the Department of Pathology at Cambridge University. Coombs came in contact with Rob Race and Arthur Mourant, who were working on the recently discovered clinical important rhesus (Rh) blood group system incompatibility between mother and fetus that caused hemolytic disease of the newborn. The immunology and genetics of the system showed that, in addition to the normal “complete” form of the anti-Rh antibody, which agglutinated Rh-positive red cells directly, there existed an “incomplete” antibody that could only be detected by Race’s very involved so-called “blocking antibody test.”

In a discussion over afternoon tea one day with Race and Mourant, Race turned to Coombs and stressed there was a real need for a simpler, better test to measure these so-called “incomplete” antibodies. According to a tale that has become something of an immunologic legend, Coombs developed the principle behind the antiglobulin test while traveling to Cambridge from London that evening on an ill-lit wartime train. Coombs reflects, in a 1988 article, how “unable to read, I was pondering how to measure these antibodies on red cells.” Reflecting on Ehrlich’s side-chain theory, he deduced that when these incomplete antibodies reacted with the red blood cells, the red cells would become coated with anti-Rh immunoglobulin and that a further antibody against the globulin fraction of the serum would then agglutinate the cells. In subsequent series of experiments conducted with Mourant and Race, this technique proved to be extremely useful in detecting Rh antibodies and other incomplete IgG antibodies. The description of the method and application to various diseases was published in The Lancet and British Journal of Experimental Pathology in 1945 and 1946. Within a very short time, the antiglobulin
(Coombs) test was adopted by virtually every hematology laboratory and blood transfusion service worldwide.

He preferred the test not to be called the Coombs test. Because of simplicity, however, the antiglobulin test is almost universally referred to as the Coombs test. Despite the stellar career, he continually demonstrated personal humility. He was a self-effacing man who didn’t seek fame.

The work with which the name of Coombs will always be associated, the discovery while still a graduate student of the antiglobulin reaction, is only a small part of his enormous contribution to immunology. He played a leading role in the development of the clinical immunology. His research interests were varied, involving such unrelated areas as asthma and allergy, transplantation surgery, rheumatology, and autoimmunity. Clinicians and scientists worldwide came to exchange ideas on disease mechanisms and to work and study with him. He was always involved in multiple scientific investigations simultaneously.

He was devoted to his laboratory work and training of a large number of PhD students who came to his laboratory from many parts of the world. He was a person of towering intellect with a remarkably wide range of scientific interests and a talent for technical innovation. He was a careful experimentalist; everything had to be brought to the highest attainable level of excellence: he was a perfectionist, a hard taskmaster, and a very inspirational teacher. Those of us fortunate enough to come under his influence were deeply affected by his infectious enthusiasm. He was especially generous in including us in visits with the many outstanding internationally renowned scientists who came into his laboratory. He cared enormously about those who trained with him and followed our careers with affectionate interest.

He was elected to the Royal Society in 1965 and in 1973 was elected as Honorary Fellow of the Royal College of Physicians, a rare honor for a nonmedically qualified person. He had an impressive list of honorary degrees and awards for his work from the Universities of Guelph, the Netherlands, and Edinburgh. He received many prizes and awards, including the AABB Karl Landsteiner Memorial Award. It was the great respect and affection he earned from all those who passed through his laboratory, however, that gave him the greatest satisfaction.

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