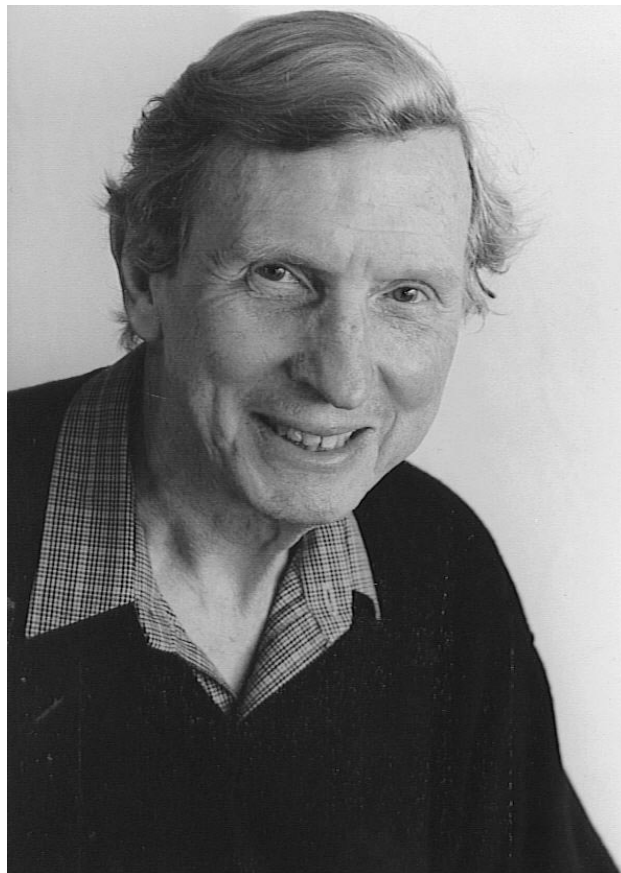


Memorial

Geoff Waites' premature death robs the Andrology community of an exceptional leader. Geoff was a kindly, wise patron, a valued colleague, and loved friend of so many of us. At 76, he had a full life as a scientist and manager, yet his restless energies never slowed and he still had enough ideas, enthusiasms, and projects to fill another decade. So, we are greatly diminished by his loss.

Geoff completed his PhD 50 years ago. His research produced fundamental concepts, such as the spermatid cord as a countercurrent heat exchanger maintaining testicular temperature, the blood-testis barrier, the role of the epididymis in maturation of sperm function; and he discovered the first prototype posttesticular male contraceptive. As a past master, Geoff deeply respected good science but even more loved the hard-working scientists who created it. Above all, he reveled in the opportunity to harness the best science for enhancing people's lives. During his 11 years as Manager of WHO's Male Task Force, with Ebo Nieschlag as his Chairman, he directed its golden age securing proof of principle for hormonal male contraception—a monumental undertaking—as well as organizing multicenter clinical trials in China and Indonesia, creating the WHO Semen Manual, and running practical Andrology Workshops all over the world. His last paper was a wide-ranging history of the WHO Male Task Force. When male contraception comes to its overdue fruition, it will owe a great debt to his quiet persistence and effective guidance. Kind and gentle in all his dealings, Geoff was nevertheless impatient for progress. To the world of science, he brought organizational insight, while to the world of scientific project management, he brought the intelligence and creativity of an outstanding scientist. Both were immeasurably enriched and in both he placed people at the heart of matters. Whatever he did, measuring his achievement by what went before and after, he was truly great.

Geoff had a life-long commitment to his students and colleagues, always staying in touch and being proud of their progress. He understood the value of tact and timely encouragement, virtues he practiced rather than preached. He led by example, with faith in the soft power of persuasion. Above all, Geoff's scientific and personal integrity and dignified humility shone like a beacon, infused with wit and wisdom. Now we will miss him, his wry and priceless humor, his love of puncturing pomposity,



Geoff Malcolm Hasting Waites (1928–2005)

and his valuing of fairness and progress. Never again will we get to see that wonderful sight of an angular figure, in a crumpled camel-colored suit, loping toward you with a cheeky grin that barely held back some funny story, eager to seize you by the arm for his latest enthusiasm, and to sweep you away with his love of life, his joy in science, and his abiding mission to leave the world a better place, especially for those whose lot in life was unfair, unjust or just plain unlucky.

Geoff Waites was a pioneer of Andrology and committed internationalist. He traveled a lot, not just because he delighted in meeting different people and unfamiliar cultures, but because he loved bringing Andrology expertise to all corners of the globe. Although shunning the tributes, he would have liked that the ISA honors him with a talk on the science of Andrology in a global framework, for that is his legacy.

Personal Remembrances

From Trevor G. Cooper and Ching-Hei Yeung

Ching-Hei and I met Geoff at Reading University, England, where he was our PhD supervisor.

Trained as a physiologist, Geoff's early work was on nerves and vasomotor responses, and he retained this interest in vascular physiology in his future research on the male reproductive tract. Working in Australia with the problems of summer infertility in rams, he showed the importance of apocrine sweat glands of the scrotum (a *Nature* paper) and that countercurrent heat exchange in the spermatic cord acts to cool incoming arterial blood to the testis. He followed this up by demonstrating that the damaging effects of scrotal heating on semen quality were due to unequal changes in testicular blood flow and metabolism. His work with Brian Setchell reflected their common interest in measurement of blood flow and vascular permeability, and they were the first to demonstrate significant variations in different regions of the epididymis (another *Nature* paper) before the morphological differences in endothelia were known. His expertise at cannulation led to most important discoveries on the composition of intratubular testicular fluid and the study of immature spermatozoa just shed from the germinal epithelium (yet another *Nature* paper) first in rams and subsequently in rats and monkeys by Geoff and in other species by others. This ability to collect, in this way, uncontaminated samples of testicular spermatozoa, sometimes over days from a conscious animal, enabled the nature of sperm maturation to be defined by comparing these spermatozoa metabolically and biochemically with those from the cauda epididymidis. Studies on the effects of heat on testicular fluid and sperm production and metabolism followed in a series of classic papers. When combined with cannulation of testicular lymphatics, the way was open to demonstrate that a blood-testis barrier existed limiting the ingress of circulating compounds, again initially shown in rams but subsequently demonstrated in rats (my (T.G.C.) PhD thesis) and later in other species. Ultrastructural techniques were soon employed in other labs to locate the anatomical sites of the barrier. Testicular fluid proved to be similar in many species but far different from fluid leaving the epididymis, and the consequences of this for the maturing spermatozoa are still being studied. One aspect, osmolality, is our current research interest.

Geoff's lab was a crossroads for international scientists, many from the Indian subcontinent, who worked on research on male contraceptives (Gossypol, *Trypterigium wilfordii*). The action of testicular toxicants fired Geoff's interest in the entry of these compounds into the testis now that both testicular fluid and sperm could be col-

lected. The inhibition of sperm glycolysis by alpha-chlorohydrin prompted the synthesis of other chlorinated compounds at Reading, which were tested for their action on sperm metabolism and male fertility. The requirement for potential posttesticular contraceptives to access epididymal spermatozoa brought Ching-Hei to Geoff's lab from Hong Kong, where she had developed, with Patrick Wong, an epididymal cannulation procedure. Ching-Hei's PhD thesis and my postdoctoral work with Geoff utilized this technique to characterize the blood-epididymis barrier in rats. Geoff's introducing us to "functional sterility" proved an important concept for us both, as it has consumed a major part of our research lives since leaving his lab.

When asked to mention Geoff's role as a teacher, both Ching-Hei and I had to stop and think about it. The difficulty lay in his teaching method: knowledge was imparted subliminally, not imposed, as we sat together at the bench pulling catheters and cannulating any orifice available. There was always a cheerful rapport in the lab, and we both remember carefree days lived in true camaraderie, delighting in the same ridiculous sense of humor. Much admiration has been aired about Geoff's integrity, wisdom, and sense of humor, but what we remember him for mostly is his warmth and kindness, his willingness to listen and encourage, and his readiness to help young scientists, particularly those in developing countries. Outside academia, this interest was extended to children from the developing world, and nowhere was this more evident than in his work with Concern Ethiopia and the building of schools (the first bearing his wife Doreen's name) in that country.

We shall miss him a lot because he was more than a scientific adviser, but also a close personal friend, in whose lab we met, and in whose home we could relax when times got tough.

From Brian P. Setchell

The death of Geoffrey Waites in May 2005 has deprived the world of one of a most able and experienced scientific andrologist. Geoffrey did his first degree, a BSc, at Birmingham, then did a Part II in Physiology at Cambridge. As he had a Cambridge degree, he was permitted to do his Cambridge PhD at the Institute of Animal Physiology at Babraham just outside Cambridge, with the first Director Ivan de Burgh Daly, on the nerve supply to the heart of the sheep. Geoffrey came to Australia in 1958 to the CSIRO Division of Animal Physiology, Prospect, a suburb of Sydney, to work with George Moule, a veterinarian who had noticed that rams in Queensland became infertile during the summer heat. Geoff and George collaborated for several years and published several papers together, two of which (Waites and Moule, 1960, *JRF* 1, 223; and 1961, *JRF* 2, 213) were important in establishing that the

spermatic cord in the ram acted as a countercurrent heat exchanger and also eliminated the pulse from the arterial blood. I did my PhD at the Veterinary School at Cambridge at about the same time as Geoff, and although I visited Babraham several times, as far as we could determine, Geoff and I never actually met during that time.

When I returned to Australia at the end of 1957, a mutual friend from Babraham, Alan Pierce, later Chief of CSIRO Animal Health, suggested that we meet when Geoff came to Sydney. Our long-lasting collaboration on the physiology of the testis and epididymis began under somewhat unusual circumstances. At the time we met in Sydney, I was interested in the possibility that the sheep had a different catecholamine response to hypoglycemia, which might have influenced their clinical response. When I read a paper that claimed that the temperature of the denervated ears of rabbits could be used as a bioassay system for adrenaline, and as I found that Geoff had described a surgical method for removing the superior cervical ganglion of sheep (1957, *J Physiol* 135, 52), we started a project on the catecholamine response of sheep to hypoglycemia, the results of which were written up in our first joint paper (1962, *J Physiol* 164, 200).

In this study, we also denervated the hearts of two sheep, again using Geoff's knowledge of the relevant anatomy obtained during his PhD (1957, *J Physiol* 139, 417, and 135, 58). During this time, we discovered that we shared an interest in cricket, and arranged several matches between the Prospect team and a team from the laboratory where I was based, which included a NSW state player and his younger brother, who later played for Australia. Geoff was a very fine batsman and also a good fast bowler, but he had some uneasy moments facing this very tall 17 year old, who, a few years later, was bowling for Australia in Test matches.

Then in 1962, I applied for and got a research job at CSIRO Prospect and Geoff and I began a collaboration to develop techniques for measuring blood flow and metabolism in the testis and epididymis (1964, *J Physiol* 171, 411; 1964, *Nature* 203, 317). As well as demonstrating important regional variation in the epididymis, we found interesting effects in the testis, during changes in temperature (1964, *JRF* 8, 339) and nutritional status (1965 *JRF* 9, 149). During these blood-flow studies, we noticed that the values obtained with two different indicators (iodoantipyrine and rubidium) were quite different in the testis and brain, but similar in all other tissues we examined. This observation led to the concept of the blood-testis barrier, analogous to the blood-brain barrier, which was further developed when Geoff and I, with Sepp Voglmayr, established a technique for chronic collection of fluid from the rete testis of rams (1966, *Nature* 210, 861) and found that this fluid was quite different in com-

position from blood plasma or testicular lymph (1967, *JRF* 14, 87).

The situation at Prospect when I joined the staff there and for the first few years was a scientific paradise. Facilities were excellent and money seemed to be no problem. In fact, Geoff and I were invited to apply for the funds for an automatic gamma counter by a representative of the Ford Foundation, so that we could avoid sitting up to 2 or 3 AM counting the isotope levels in pieces of testis and other tissues, using a manual counter, but the Chief of the Division refused us permission to do so, saying that if the project was worth doing, CSIRO would buy the necessary equipment, and they did.

In 1965, Geoff had the opportunity to work at Jouyen-Josas near Paris with Robert Ortavant, which developed his love of France and things French, and when he returned to Australia, he was appointed Associate Professor of Physiology at Sydney University. At Geoff's suggestion, I spent 1967 at Babraham working with Jim Linnell, who had been a close friend of his during his Babraham days. My collaboration with Geoff in Sydney continued until 1969, when both of us independently, and without the other knowing, accepted positions in the United Kingdom, Geoff as Professor at Reading and me as a Research Officer at Babraham. We left Sydney within days of one another, Geoff and his family going east and us going west, by boat. We continued our collaboration in the United Kingdom for some years, some experimental, but mostly writing together, and one of Geoff's PhD students (Steven Main) worked with me for several years at Babraham as a post doc funded by NIH.

Geoff was a very fine sportsman and a wonderful raconteur. His stories were mostly based on his own experiences. For example, he told a story of a young research student, when the current technique for measuring blood pressure involved a fluid catheter connected to a reservoir topped by a fine rubber diaphragm. The best rubber for this purpose was the rubber from a condom and, on one occasion, the young, rather naive student was sent by a senior colleague to purchase a condom. When asked whether he wanted plain or teat-ended, he replied that it did not matter as they cut off the end before they used them, somewhat to the surprise of the assistant in the pharmacy.

The other story I remember well involved two cleaners at Prospect, who came in after office hours, by which time most of the scientific staff had usually gone home. Geoff was sitting at his desk behind the door on this occasion writing up the results of the day's long experiment, which had produced a certain amount of mess in his lab. As the two cleaners came level with his open door, he heard one of them exclaim "Oh Jesus Christ." The other said: "Shush, he's behind the door," which Geoff claimed gave him divine status.

When he was at Jouy, he was invited to join Charles Thibaut, the then director, for lunch with a rather crass Australian who was visiting the lab and who shall remain nameless. They were served a lovely bottle of Loire Rose wine. Thibaut had perfect English, but when the Australian visitor asked if we in Australia made rose wine by mixing equal parts of red and white wine, all Thibaut could say was “jamais” (never), the only time Geoff had known Thibaut’s English ever to desert him.

I had less contact with Geoff during his later work at

WHO, but he certainly made, during that time, an important contribution to international andrology. His connections with China helped bring andrology in that country into the mainstream of the discipline, and he fulfilled an important role as Chairman of the Advisory Board of the *Asian Journal of Andrology* up to the time of his death.

Geoff was the best colleague and most entertaining companion I have ever known, and I will miss his friendship more than I can ever say.