

## Sir Arnold Theiler

Arnold Theiler was born on 26 March 1867 to Franz and Maria Theiler in the town Frick in Switzerland. His father, son of a farmer, taught natural history and mathematics at the local three-man school, of which he was the headmaster. Although he had no academic qualification, Franz Theiler excelled in his vocation, and shared his passion for natural history with his young son, taking him on long hikes in the mountains and green fields. Arnold was thus exposed to all the marvels of natural history in his environment, including rocks, plants, trees, animals, birds, insects and mushrooms as well as his father's beekeeping hobby.



Arnold was initially inclined to follow in his father's footsteps, studying to become a teacher, but then opted for veterinary surgery at the Veterinary School of the University of Zürich. Despite partaking wholeheartedly in typical exuberant student activities, he completed his course successfully, obtaining a Veterinary Diploma in August 1889 at the age of 22. Having read Darwin as well as Livingstone and being determined to emigrate, he finally decided to opt for the 'Zuid Afrikaansche Republiek' (ZAR) in South Africa, either to practise privately as a veterinarian or to take up a government position. As he did not have a firm appointment he packed a trunk with equipment, instruments and medicaments to enable him to set up a practice. On arrival in Cape Town on 6 March 1891, Arnold discovered that the trunk had not arrived; leaving him, already out of pocket, with no means of supporting himself. He was forced to take on an interim job as a farm hand with AH Nellmapius on his farm - the future Irene - near Pretoria in the ZAR. Three months later his left hand was accidentally severed above the wrist while operating a steam-driven chaff cutter. Miraculously surviving the ordeal, this appalling mishap inevitably influenced Theiler's entire future career. Theiler married Emma Sophie Jegge, a friend from his early school days at Frick in Switzerland, on 26 October 1893. The couple had two sons and two daughters of which the younger son, Max, became a medical doctor and was awarded a Nobel Prize in Physiology and Medicine in 1951 for the research that he conducted at the Rockefeller Foundation on the development of a vaccine against yellow fever. Hans, the elder son, became a veterinarian; the elder daughter, Margaret, remained unmarried and became a teacher, whilst the younger, Gertrud, also unmarried, became a celebrated parasitologist, eventually specialising in tick taxonomy.

Having attracted the attention of senior ZAR officials when officially contracted to produce a human smallpox vaccine (which was highly effective); a permanent government position became imminent. With rinderpest threatening southern Africa, President Paul Kruger appointed Theiler as 'Gouvernement-veearts' (state veterinarian) of the ZAR in May 1896, specifically to combat the devastating pandemic. Working at a field laboratory in the Bushveld near Groot Marico in 1896, Theiler and Herbert Watkins-Pitchford, who was then Principal Veterinary Surgeon of the Natal Colony, developed the first safe (but laborious to produce) vaccine against rinderpest, a so-called serum-virus type of vaccine, within a matter of only 6 weeks. This was the birth of systematic, mission-orientated veterinary research in this country.

Already famous and having befriended powerful senior officials and some politicians of the ZAR, Theiler used persistent coercion to have a tin shanty building at Daspoort, which he converted into a laboratory, allocated to him in 1898. Theiler was conscripted into the Boer forces when the Anglo-Boer War broke out in 1899, serving as the only veterinarian on the ZAR side compared to dozens in the British army. He saw service mostly on the Natal front but returned to his laboratory after the conventional part of the War was over. He was appointed as government veterinary bacteriologist by the Milner regime in 1903. A further great research triumph followed in 1903 when Theiler distinguished East Coast fever, another devastating disease entirely new to science, from redwater in cattle, showing that it was transmitted by the three-host tick *Rhipicephalus appendiculatus* (brown ear tick). The protozoan parasite responsible for East Coast fever was named *Theileria parva* in his honour.

Theiler also resolutely conducted pioneering research on African horse sickness, *inter alia* discovering that this highly fatal and therefore economically disruptive disease - at a time when horse transport was crucial - was caused by a filterable virus, and producing the first crude vaccine against it. He was also first to realise that there was a plurality of strains in the horse sickness virus and this later proved to be so vital in the development of an effective vaccine against the disease.

Theiler pursued his two major career objectives with great determination: One was realised in 1908 when the research laboratory (the Veterinary Bacteriological Laboratories of the Transvaal) he had planned, was inaugurated on the farm *De Onderstepoort* near Pretoria. Very soon it was internationally known just as **Onderstepoort**. The other, even more ambitious objective - an 'own' Faculty - was also eventually achieved, but Theiler had to wait until 1920 before it realised.

Theiler was honoured by the British government on two occasions:

- He was awarded a C.M.G., (Companion of the Order of St. Michael and St. George) by King Edward VII in 1907.
- He was knighted K.C.M.G. (Knight Commander of the Order of St. Michael and St. George) by King George V in 1914.

As researcher of international repute, Theiler is perhaps best remembered for unravelling the nutritional and microbiological course of events leading to cattle developing the disease known locally as lamsiekte, a manifestation of botulism. Theiler 'retired' for the first time at the end of March 1918 when he was 51 years old. This was, however, hardly a retirement because he continued to receive emoluments from the government for another year. Theiler was soon prevailed upon by his successor, RE Montgomery, to re-join the Onderstepoort staff with lamsiekte as special assignment. At the end of February 1919 Theiler moved to the farm Armoedsvlakte, near Vryburg, on which lamsiekte was rampant. Here he discovered that lamsiekte was caused by toxins produced by a certain species of anaerobic bacterium. However, cattle first had to develop a craving for eating rotten carcass material containing the toxins. Theiler proved experimentally that this bone craving was a manifestation of rickets, developing in cattle grazing on pastures that were deficient in phosphorus due to a shortage of phosphate in the soil. It was therefore essential to supplement phosphate in areas where lamsiekte occurred. Later Onderstepoort also developed a very effective vaccine against the disease.

Montgomery left Onderstepoort in 1919 on long leave, not to return, and on 1 April 1920 Theiler was reappointed ('promotion' was the word used) at Onderstepoort, this time with the new title of Director of Veterinary Research and Education as he was now also Dean of the new faculty.

Theiler had an excellent personal relationship with the politicians, *Generals* Louis Botha and Jan Smuts. However, when *General* JCG Kemp, who apparently wanted to get rid of the opinionated Theiler, appeared on the scene as Minister of Agriculture in 1924, he became - according to his biographer, *Thelma Gutsche* - an embittered person.

Theiler finally retired from Onderstepoort in 1927 at the age of 60 and was replaced by the 'crown prince' of his choice, PJ du Toit.

The Theiler couple left South Africa on a world trip and eventually settled down in Switzerland where he continued with osteology research at local universities. However, he returned to South Africa in 1934, working unpaid at Onderstepoort. He died in London from a heart attack on 24 July 1936 while attending a conference at which his youngest son, Max, was due to speak on the yellow fever vaccine that he had developed in the USA and for which he later received a Nobel prize.

*FINIS*