

Professor GVR Born FRS 1921-2018

Obituary.

Gustav Born was born in Göttingen in 1921. He was the son of Max Born who gained the Nobel Laureate in physics in 1954 for his pioneering work in quantum mechanics. In 1933 when the anti-Semitic intentions of Hitler's Third Reich became all too abundantly clear, the Born family were advised to leave Germany. With the help of Max's academic contacts, they left for Italy and from there to Great Britain where they eventually settled, taking up UK citizenship. After a brief stint in Cambridge they moved to Edinburgh where Max was eventually awarded a chair in 'Natural philosophy' and they made their home.

Following in the footsteps of his grandfather, also called Gustav, 'Gus' read medicine at the University of Edinburgh finishing his training in 1943. He enlisted in the Royal Army Medical Corps and he was posted to the Far East. He was amongst the first allied medical staff to visit Hiroshima after the atomic bomb blast. It was an encounter with survivors who had developed severe bleeding problems which sparked off his interest in platelets.

After the war, Gus began postgraduate research in the Dunn School of Pathology in Oxford studying with Florey and others, graduating with a DPhil in 1951. During his early career, Gus worked on various topics including histamine and acid secretion, neonatal physiology, smooth muscle and catecholamine pharmacology. However, he will mainly be remembered for the seminal contributions he made to our understanding platelet biology and

circulatory pathophysiology, many of which have provided the basis for novel therapeutic innovations.

Beginning in the mid 1950's he began an intensive study of blood platelets. Working first on the biochemistry of their intracellular granules, he showed that they contained ATP and actively accumulated 5HT and catecholamines. Looking for a way to study the aggregation response in more depth, and recalling a turbidometric technique for measuring nuclease activity he had learned in Oxford, he devised (in the early 1960's) a simple, but extremely effective, device with which to measure the behaviour of these cells when they were stimulated to aggregate by pro-thrombotic stimuli, thus initiating a whole new sub-discipline of 'platelet aggregometry'.

This device, which is still known as 'The Born Aggregometer' has found utility in laboratories and hospitals all over the world and has been used extensively in basic, epidemiological and clinical investigations. It revolutionised the study of platelets and also it is also noteworthy that it was probably the first system in which a pure population of human single cells could be studied with ease and their biological properties and responses to drugs investigated.

Using his aggregometer Gus, together with his numerous students and colleagues, elucidated the basic mechanisms of platelet aggregation and made substantial contributions to the notion that nucleotides such as ADP which are released during aggregation are crucial regulators of this response. He played a key role in the development of the idea that aspirin-inhibited platelet aggregation thus opening the way for its widespread use as a 'cardiac' drug. Using his technique he also researched other pharmacological inhibitors of this response thereby initiating a new era of anti-platelet therapy

that subsequently came to include drugs used for the prevention of heart attack and stroke, such as clopidogrel.

From the mid-1970s, Gus also worked on atherogenesis. He demonstrated that this was accelerated by endogenous pressor agents including adrenalin, helping to explain why hypertension was a risk factor in coronary heart disease. He showed that the liability of atherosclerotic plaques to rupture depended upon their deformability and on their macrophage and lipid content. He was also a pioneer in the use of intravital microscopy for the study of neutrophil behaviour in the microcirculation. Today, these experiments seem even more striking considering that in that pre-digital era, the records had to be captured in pitch darkness on 16mm cine film!

Throughout a very distinguished career Gus held three prestigious chairs in pharmacology –Vandervell Professor of Pharmacology at the Royal College of Surgeons (1960-1973), Shield Professor of Pharmacology at the University of Cambridge (1973-1978) and Professor of Pharmacology at King's College, University of London (1978-1986). Since the late 1980s, Gus worked in (and was a cofounder of) The William Harvey Research Institute at Barts and the London School of Medicine where, with John Vane and others, he helped create another institution with a unique ambience as he had done at the Royal College of Surgeons in the 1960s-70s. Here, in his 'Pathopharmacology' lab he pursued his research interest in atherogenesis and was still active and publishing until his late 80s. His 90th birthday *festschrift* on the campus was a memorable event.

Gus also held a number of visiting chairs in pharmacology, including the William Creasy Visiting Professor in Clinical Pharmacology at Brown

University School of Medicine in Providence, Rhode Island (1977). He also consulted widely for the pharmaceutical industry: advising companies such as MSD, ICI, Reckitt and Colman, Boehringer-Ingelheim, Myers, Bayer and Biorex.

During his career, Gus has published with a great many famous physiologists and pharmacologists, including Edith Bülbring, Geoffrey Dawes, Hugh Blaschko, John Vane and others. He was elected a fellow of the Royal Society in 1972 for his work on platelets and subsequently won the Royal Medal. He was an Honorary Fellow of The Royal College of Surgeons, of the Royal College of Physicians, of Kings College London and of St Peters College, Oxford. He was an Honorary life member of the New York Academy of Sciences as well as a member of the Leopoldina and other academies. He was a former President of the International Society of Thrombosis and Haemostasis. As well as 10 honorary degrees, 18 medals or other prestigious awards, his *curriculum vitae* identifies 28 named lectures and some 350 publications.

Gus joined the BPS in 1953 and served on the main committee and the editorial board in the 1960s. He was awarded the Wellcome Gold Medal in 2009. He died peacefully on April 16th 2018 aged 97, surrounded by his family. He will be greatly missed by many of his past students and colleagues.

Rod Flower.