

Thomas Hamilton Bothwell

Thomas Hamilton Bothwell was born in Johannesburg on 27 February 1926. His academic ability led to his being awarded a scholarship to St John's College in that city, where he matriculated at a very young age in 1941. He then commenced his medical studies, which culminated in his obtaining the degree of Bachelor of Medicine and Bachelor of Surgery at this university at the end of 1947. His association with the University was to last for 47 years, including 25 years as Professor and Head of the Department of Medicine and Chief Physician of the Johannesburg Hospital and finally, after his retirement from that position, in a two-year term as Dean of the Faculty of Medicine. During all of this time Thomas Bothwell served the University with loyalty and great distinction, as a research scientist, a teacher, a physician and an administrator. His research into iron metabolism established him as an internationally renowned authority in this field and related fields and resulted, at a time when South African scientists were restricted by the politically motivated academic boycott, in his expertise and wisdom being utilized on a number of international committees concerned with the investigation of nutritional anaemias and the planning and implementation of food fortification on a global scale. Thomas Bothwell was undoubtedly South Africa's foremost medical scientist of his time, and he set the standards against which all future medical research in this country will be judged.

Thomas Bothwell served notice of his outstanding potential when on graduating Bachelor of Medicine and Bachelor of Surgery in 1947 he was awarded the bronze medal of the Southern Transvaal Branch of the Medical Association of South Africa as the most distinguished medical graduate of the year, as well as the Medical Graduates Association prize for the best final year student in the subject of Medicine. After serving his internship and registrarship in medicine at the Johannesburg Hospital and initiating his research interest in iron metabolism, he was awarded a Nuffield Travelling Fellowship. He proceeded in 1954 to the University of Oxford, where he undertook research in the new field of iron kinetics in the laboratory of Professor Lewis Witts. As a result of this work he was awarded a Lederle Research Fellowship, which enabled him to continue his pioneering research on internal and external iron exchange in the laboratory of Clement Finch at the University of Washington. Thirty years later the article describing some of his research was identified by the Center for Scientific Information as one of the most quoted in its field. Bothwell returned to Johannesburg in 1956 to take up a post as physician in the Department of Medicine of the University and to establish a research unit in iron metabolism. This unit was funded in the early years by the Council for Scientific and Industrial Research and the South African Atomic Energy Board, and later by the Medical Research Council. In 1967, on the retirement of Professor Guy Elliot, Thomas Bothwell was appointed Professor of Medicine and Chief Physician of the Johannesburg Hospital, a post he held with great distinction until his retirement at the end of 1991.

In a research programme that spanned 40 years Thomas Bothwell covered virtually every aspect of iron metabolism. Although his initial interest in the field had been stimulated by a patient of his who was suffering from the rare inherited disorder of genetic haemochromatosis, on his return to South Africa he focused his attention on aspects of iron balance that were pertinent to South Africa. Striking disturbances in iron balance occur in different population groups in this country: varying degrees of iron overload are almost universally found in the adult black male population, and iron deficiency occurs frequently amongst female Indians. A number of his studies were concerned with the causation, pathogenesis, and pathological sequelae that occur in blacks who drink sorghum beer. The many biochemical derangements induced by this form of iron overload provided fresh insights not only into other forms of iron overload but also into the normal metabolism of iron in the body. In more recent years the emphasis of his work shifted towards iron deficiency, since this is the commonest nutritional disease in the world today, in particular to a consideration of the pathogenesis of the deficiency. This led to a number of investigations in which information was gathered on the absorption of various forms of food iron and the interactions that occur between different foods within the gut. Of especial importance was the identification of ascorbic acid as the main enhancer of iron absorption in the diet and the polyphenols as the major inhibitor. Strategies were developed which he hoped would allow for effective fortification of national diets with iron in those countries where iron deficiency is prevalent. Running parallel with these studies was a series of more basic experiments relating to aspects of normal iron metabolism. Work was done on external iron exchange, including the mechanisms

involved in iron uptake into red cell precursors, on iron storage in a number of organs, and on the biological and molecular processes involved in cellular iron transport.

The brilliant academic career of Thomas Bothwell is reflected in the nearly 300 full scientific articles that he has published. In addition, his book on iron metabolism has for many years been the standard reference in its field. His numerous contributions to our knowledge on iron metabolism and related fields have attracted national and international interest and have resulted in his receiving many honours and awards, including our degree of Doctor of Science - a higher doctorate awarded for published work making a distinguished contribution to the advancement of knowledge - honorary Doctorates of Medicine from the Universities of Cape Town and Natal, gold medals from the South African Association for the Advancement of Science and the Medical Research Council, an Honorary Fellowship of the College of Physicians of Edinburgh, a Fellowship of the Royal Society of South Africa, an Honorary Fellowship of the American College of Physicians, the Percy Fox Foundation Award for Outstanding Achievement, and the State President's Order for Meritorious Service (Silver). Thomas Bothwell has served on numerous local and international scientific committees, including the Expert Committee of the International Atomic Energy Agency/World Health Organization on Nutritional Anaemia, the Expert Iron Panel of the International Committee for Standardization in Haematology, and the International Nutritional Anaemia Consultative Group.

The enthusiasm of Bothwell for research and his scientific integrity attracted many young medical graduates to the Iron and Red Cell Metabolism Research Unit. Over the years, eighteen of these researchers received the degree of Doctor of Philosophy under his supervision, and most of them are still active in various aspects of haematological research in different parts of the world. As it is written in the book of Proverbs, 'Iron sharpeneth iron; so a man sharpeneth the countenance of his friend'. In addition, he was at all times strongly supportive of the research endeavours of other members of the Department and encouraged young physicians to become actively involved in research.

Thomas Bothwell has also played an active role in the affairs of the South African Medical Research Council, having been a member of the Council between 1969 and 1975, and of the South African College of Medicine, on the Council of which he has served since 1986. He was chosen as the South African Sims Travelling Fellow in 1990. In addition, he was a member of the Scientific Advisory Council to the Prime Minister from 1983 to 1986, and has been a member of the South African Medical and Dental Council since 1984. He also served with distinction on a great many University committees, including several of the most senior ones.

Much of Thomas Bothwell's tenure as head of the Department of Medicine coincided with the political upheavals which beset this country, and which made it extremely difficult to uphold standards of teaching and patient care. In spite of this the Department grew in size and stature to its present position. Throughout his career Thomas Bothwell was a lucid and effective teacher. He constantly strove to improve the standard of teaching within the Johannesburg teaching-hospital complex: his lectures were models of clarity and logic. In recognition, he was awarded the P V Tobias Award for Excellence in Clinical Teaching in 1984. He has also been an astute, thorough and caring physician, who by his example has encouraged younger members of staff and students to attain the same high standard. The depth of his compassion and sympathy for his patients is legendary. Modest to a fault, blessed with a keen sense of humour and the gift of writing graceful prose, he is the very antithesis of the stereotype prima donna model of a clinical professor. As Dean of the Faculty of Medicine he conformed to his lifelong 'open door' policy, resulting in his being readily accessible; he was always prepared to listen to a case, he appreciated the merits of the various health disciplines, and he was willing to be involved in the changing attitudes to health services in the country. Now in his retirement he is playing a significant role in the rethinking and planning of these services and a responsive research system.

The University is privileged to be able to signify its deep appreciation of the devotion to its cause by one who has been a model of what every academic should be and of his unique contribution to both the University's standing and welfare and that of our country as a whole by conferring on him the degree of Doctor of Science in Medicine, *honoris causa*.