

## SIR ARTHUR KEITH

Sir Arthur Keith, who died on January 8, 1955, at the age of 88, was our oldest honorary member. His main work in cardiology was completed before the British Cardiac Society was formed. He was born in 1866 at Old Machar in Aberdeen where his father had a farm, and had nine brothers and sisters. When he was eight, the family moved to a larger farm with an attractive farm house, Kinnermit, where his brother Alec continued to farm after their father died: it remained a happy meeting place for the family for many years. Arthur does not seem to have been brilliant at school and at one time it seemed likely that he would spend his life working on the farm, but after he started as a medical student his powers developed quickly. He became an M.B. of Aberdeen in 1888, and fifty years later was rector of his old University.

Even in these early days he was keen on anatomy, but though he had qualified with distinction there was no opening for him in this line. There were not then so many hospital and school appointments and competition for the higher ones took a different form. Arthur Keith went into general practice and then went to Siam as medical officer of a gold mine, so that he could save some money to return to anatomy. Even so he had to wait and work two years in London before finding an appointment.

While in Siam he studied the anatomy of the Catarrhine monkeys, and after his return published in 1896 *An Introduction to the Study of Anthropoid Apes*. In the same year he was appointed demonstrator of anatomy at the London Hospital, at a salary of £75, but other positions such as curator of the museum soon brought this up to £300 a year.

Just before Christmas, 1899, he married Celia Gray, the daughter of an artist. This proved to be a happy companionship for nearly 35 years; unfortunately they had no children.

Throughout his life he was a keen member of scientific societies and was soon acting as secretary of the Anatomical Society. Most of his work at this stage was published in their Proceedings in the *Journal of Anatomy and Physiology* (now the *Journal of Anatomy*). Those of most interest to cardiology dealt with his studies of the auricular muscle (1902–1904), his verification of Tawara's work on the conducting system of the heart (*Lancet*, 1906, 2, 359), and his discovery with Martin Flack of the sinu-auricular node (*J. Anat. and Physiol.*, 1907, 41, 172).

Arthur Keith had a great facility for making friends with those who shared his interests and James Mackenzie was included amongst these. Since 1904 he had been examining many of the hearts in which Mackenzie had been interested in life and had found in sections that traversed the sulcus terminalis, where the superior vena cava entered the right auricle, a localized density of tissue in which nerve fibres seemed to terminate. When, in 1942, this journal published a paper on *The Conducting System of the Vertebrate Heart* by Francis Davies, Keith added a retrospect of his discovery (*Brit. Heart J.*, 1942, 4, 77) in which, with characteristic generosity, he attributed the major part in this to the work that Flack was doing with him in 1906 on the hearts of moles. This series of discoveries that had started with the finding of the A-V bundle by Stanley Kent and by His in 1893 led quickly to modern views of the origin of the impulse of the heart beat and its conduction and, though details have been added since, they have not changed fundamentally.

During this period at the London, Keith made his reputation as a great lecturer and as a practical teacher with a capacity for bringing anatomy to life. It is strange reading his autobiography to find how little confidence he had in himself as a lecturer, for there were other directions in which he was not unduly modest. He was anxious to make his teaching of real use to future doctors and as well as emphasizing the relationship of the formal anatomy of any structure to its embryology and historical development, he tried to explain its functional use and the disorders to which it was liable in clinical medicine. At this time he published *Human Embryology and Morphology*, a book that has been a standby for many generations.

Sir John Parkinson adds these personal recollections. "It was my good fortune to be a pupil of Arthur Keith, the senior demonstrator of anatomy, when I was a medical student at the London Hospital, and he was a great favourite with everyone there. As a teacher he was persuasive rather than didactic, and his contact with us was personal, indeed, fatherly. He won you to learning anatomy in that he never seemed to deal out information but rather to accompany you in the search for an understanding of it.

“ Keith was closely associated with James Mackenzie, then of Burnley, with whom he corresponded over many years; and they became firm friends. It was largely due to his influence and advocacy that Mackenzie was invited to join the staff of the London Hospital after he settled in London. Each had enormous respect for the other and, as so often, this ripened into lively affection. Mackenzie is quoted as saying ‘ Whenever Keith looks at anything, he sees something nobody else had noticed; and whenever he sees it, he begins to wonder why.’

“ In those days Keith was tall and thin with sharp features, deep-set engaging eyes, and a powerful forehead. His appearance was attractive and distinguished, and his manner invariably friendly. Everyone was captivated by the softness of his voice and his modest almost diffident demeanour. There was gentleness but no lack of confidence and power in all he said and did. No one found anything but a depth of sincerity and kindness when they knew him, and so he acquired and kept for years a wide circle of friends who became attached with affection to this great and gracious scientist.”

In 1908 Keith left the London to become Curator of the Museum of the Royal College of Surgeons. His embryological researches led him to the view that the bulbus cordis did not disappear entirely but was incorporated in the outflow tract of the right ventricle. In 1909 he published a valuable series of papers on malformations of the heart showing how important this factor was in the development of pulmonary stenosis, whether valvular or infundibular. He concluded that a large number of deformed hearts are the result “ of an arrest in that process which ends in incorporation of the bulbus in the right ventricle ” (*Lancet*, 1909, 2, pp. 359, 433, and 519).

In 1913 he was made a Fellow of the Royal Society and in 1921 he was knighted. He remained as curator of the R.C.S. museum for 25 years, making it one of the greatest collections in the world. It was a terrible loss when it was destroyed by bombing in May, 1941.

Before this he had reached the normal retiring age but when this time came in 1932 he was appointed by the R.C.S., Master of Buckston Browne Research Farm at Downe, in Kent. Six years before, when President of the British Association, he had appealed for the preservation of Down House as a memorial to Darwin who had lived there for forty years. Here he was to live for another twenty years and he greatly enjoyed the contacts this gave him with the younger surgeons who were working there. His own interests had become increasingly anthropological and he wrote several books, *Ancient Types of Man*, *The Religion of a Darwinist*, and *Concerning Man's Origin* and, since the war, *An Autobiography* (Watts and Co., London, 1950). His later writings were extensions and developments of his earlier work which, as he wrote himself, was mostly done before he was 45 years old.

He took part in the investigation of the Piltdown skull and so was involved in later controversies about it. He found it difficult to reconcile the human skull with the ape-like jaw but could not suspect the honesty of a fellow worker and so, with the other experts of the day, lent the weight of his judgement to the authenticity of this find: and shortly before his death when the fraud was discovered, he still found it difficult to think hardly of the original finder.

It was during the war, in his later days at Downe that the writer came to know him. In spite of his age, he made a deep impression as a man and as a mind. He was still a fine figure, with a handsome and incisive face and was still active physically and intellectually, as shown by the writing that he continued almost till the end. The writer did not know him well and believes that he had sometimes been a figure of controversy in the past, but his decisive views, with his gentle voice and the quiet way of expression that made a deep impression of strength and inward serenity were the expression of a man who knew the path that he wished to follow.

A hundred years ago it was not uncommon for a scientist to reach distinction in many branches, but this is now rare. Sir Arthur Keith covered a wide field though most of it converged on a common interest. He was distinguished as a man and as a teacher and for his work in embryology, in anatomy and functional anatomy, and in anthropology, as well as for his contributions to the theory of evolution.

MAURICE CAMPBELL