

FRANCIS JOHN GILLINGHAM

Born in Dorchester, England, on 15 March 1916, Francis John Gillingham, or John as he preferred, was educated at The Thomas Hardy School, Dorchester, Dorset and studied medicine at London University and St. Bartholomew's Hospital, where he won prizes in surgery and obstetrics. After graduation, he joined the Royal Army Medical Corp and was deployed for 18 months in Sir Hugh Cairns' 'crash course' in all aspects of neurological trauma. Gillingham later became commanding officer of the number 4 Neurological Surgical Unit in the Middle East and Italy – the 'Nomadic Surgeons'.

After the war he returned to Oxford and in 1950 was appointed Senior Lecturer in Surgical Neurology at the University of Edinburgh. Gillingham spent 12 years working alongside the Edinburgh University Professor Norman McOmish Dott, one of the great triumvirate of neurosurgeons that also included Hugh Cairns in Oxford and Sir Geoffrey Jefferson in Manchester. In 1961, as an expert in Parkinson's disease, Gillingham was chosen to operate on the politician S. J. V. Chelanayakam, leader of the Sri Lankan Tamil United Front – the 'Tamil Tigers'. The operation was carried out in Edinburgh and prolonged the leader's life. In 1962 Gillingham became Reader and in 1963 Professor of Surgical Neurology at the University of Edinburgh and was elected a Fellow of the Royal Society of Edinburgh in 1970. In 1980 he became President of the Royal College of Surgeons of Edinburgh, where he vigorously pursued and established Fellowships in surgical sub-specialities. Education was a primary interest and he supported the use of tutorials, television and other audiovisual aids.

Gillingham's experiences during the Second World War gave him an understanding of, and a lasting interest in, head injuries. He was working with the fully-equipped mobile neurosurgical units, the brain child of Sir Hugh Cairns, officer in charge of the 'crash course' in military head injuries. To quote Gillingham: *"He was the boss of us and greatly liked and was a friend of Judy and myself. Ours was the number 4 mobile surgical unit, we chased after the 8th Army in the desert for some two months during the huge battle for El Alamein and then to Sicily [The Nomadic Surgeons]. Ken Eden our OC from UCH in London was our CO; married with three young children, he died from poliomyelitis early in the Italian Campaign. I was recovering from poliomyelitis which left me with a paralysed jaw, eating slops for three months; however I 'cheeked' my way back to command the unit"*.

1300 missile injuries were treated in the North African Desert and nearly 5000 in Italy – Gillingham kept meticulous notes on how bullets entered, traversed and often exited soldiers' brains:

"One day a young soldier came into the pre-op tent, apparently well but for a headache and the

suggestion of neck stiffness. He had been blown up by a mine and had felt a blow to the right right side of his head. Looking with a mirror he saw a wound. I took the opportunity to look at the same spot on the left side and found a two-millimetre hole. There was nothing on X-ray and we assumed the fragment had passed right through, missing every important structure. We did nothing and the soldier returned to full fighting duties after a week – lucky chap!

These tiny missiles were just what was required for our endeavour to map the grey matter and its small and large masses. Others had done some mapping of the cortex in World War I and here was a new opportunity.I resolved therefore to face the discipline of detailed recording of every operation I did, writing in captured Italian bookkeeping books, which were sadly lost in a flood. It was important to record the direction of the missile in three dimensions, unless it was a 'through-and-through'."

Gillingham correlated these injuries with any abnormal central nervous system (CNS) signs or behavioural and emotional aberrations, and superimposed scattergrams of a similar type and looked for the appropriate function of the injured part. He made diagrams of these injuries, describing an area now known as the reticular activating system. Missiles in this area always resulted in total loss or serious loss of consciousness – nowhere else did this occur with missile injuries. This Gillingham regarded as the seat of the conscious mind, an analogy being the central processing unit (CPU) of a computer. In recognition of this work he was awarded the Medal of the Society of British Neurological Surgeons (in May 2009).

When his colleague in Edinburgh, Professor David Whitteridge, described the use of microelectrodes in distinguishing between grey and white matter, Gillingham immediately saw its usefulness in distinguishing deep brain structures. From these first microelectrode recording studies, fundamental insights were gained to improve lesion accuracy, including the observation that spontaneous rhythmical discharge from the thalamus was synchronous with tremor.

However, the main emphasis of his work in Edinburgh was on stereotaxis as an aid to localising brain lesions. He was introduced to stereotactic surgery by Gérard Guiot, who had visited Edinburgh to learn aneurysmal surgery from Professor Norman McOmish Dott and Gillingham. Several days were spent with Guiot, performing freehand pallidotomies under local anaesthesia using a subfrontal approach to the anterior perforated substance. Gillingham's wealth of experience in aneurysmal surgery led him to adapt Guiot's stereotactic method to an occipitoparietal approach to avoid striate arteries. Over the years he refined this apparatus, introducing a motorised drive and extensions, targeting the cerebellum, brain stem and cervical spine in chronic pain and dystonias.

Results from 60 patients showed that electrocoagulation lesions of the globus pallidus, internal capsule and thalamus, either separately or in combination, reduced tremor and rigidity in 88% of cases. In this era predating MRI scans, stereotactic neurosurgery proved to be one of the most important developments in 20th-Century brain surgery.

Gillingham's interest in the nature of memory and evolution never diminished. One day, discussing Marcel Proust's *In Remembrance of Times Past*, he remarked that Proust was possibly a temporal lobe epileptic, and pointed out that temporal lobectomy on the left side had to be carefully done lest damage to the superior temporal gyrus caused loss of cognitive memory, adding that certainly the hippocampus, amygdala and the wider functions of the temporal lobe are much concerned with memory, both long- and short-term. Further time and studies will reveal the cortical areas dealing with specific functions such as music, calculation, language and computerisation, which may need the access of the short-term memory.

In 2008, John Gillingham suffered and survived major cardiac surgery; he was successfully operated on by surgeons in London, for whom he had great praise. His room was sparse – a chair a table, a floor cover – but was spotlessly clean. In December 2008 he wrote "*I am now stabilised on cardiac drugs and prednisolone, 18 milligrams a day, for giant cell arteritis. How are you? Have you had giant cell arteritis? A horrid thing! Also I have been confined to a wheelchair with a weak shoulder. I do wonder about its pathology,?a worn out adrenal cortex. Not bad for 93 eh!*".

In retirement he enjoyed debating evolution and creationism. He agreed with both Darwin and David Attenborough about the anatomy of descent and basic functions, but argued that our brains have evolved to such a degree beyond the apes that perhaps we should look to a missing link for our intellectual functions; but felt that we have lost ground to the apes, greed and other things having set us back. Darwin and Attenborough have emphasised an anatomical approach but the evolution of consciousness remains an enigma. To quote Gillingham: "*We have learned from rehabilitation studies that most of us die without having exploited more than 50% of our brain potential. There are areas of the brain where even grey matter substations have not yet been allocated a function. Systems within the brain, if interrupted in their connections, can, with skilled rehabilitation, be persuaded to initiate alternate connections within the brain and spinal cord. This plasticity is noteworthy in the CNS, which so far has not been persuaded to regenerate*".

His wife Judy was a constant support. He married Judy (Irene Jude) in 1945 and they had four children and many grandchildren, as shown in this family photograph.



Photo: Francis Gillingham (standing 5th from left), December 2008.

Hugh Cairns, a brilliant administrator, arranged their wedding locally in Oxford, followed by a reception in his house. After the war they settled in a splendid house overlooking the Forth, where Judy was a sparkling hostess entertaining guests with tales of their many tours abroad.

In retirement, Gillingham went as Professor of Neurosurgery to the King Khalid University Hospital at Riyadh – at that time a veritable nest of distinguished medicos. Gillingham's services were in demand during the planning for a new medical school and I remember his insistence for the necessity of a helicopter pad. He at once set about with great gusto, improving training and skills in the neurosurgery section which soon began to flourish. He was helped along by a fortuitous first case. A young male Saudi had suffered severely from epilepsy which was refractory to treatment despite the efforts of clinics in Paris. Gillingham diagnosed a cerebral aneurysm and operated with success. It is apocryphal that outside the door of the theatre during the operation there stood a faithful family retainer wielding a sword!

His modesty and kindness were apparent throughout his life; all who met him remained to admire him. Once, walking through the main corridor of the King Khalid Hospital in the company of a Syrian Surgeon who had studied in Tübingen, we encountered John, advancing towards us with his

entourage. As they passed by, the Syrian doctor lent to my ear and whispered '*Do you see that man? I would never tell him so but I would do anything for him!*'

Nihil tetigit quod non ornavit

Angus E. Stuart

Francis John Gillingham CBE, MBE (Mil), MBBS(London), Hon MD Thessaloniki, FRCS, FRCSE, FRCPE, Hon FRACS, Hon FRCS Ireland, Hon FRCPS Glasgow, Hon FSACS, Hon FCS Sri Lanka. Born 15 March 1916; elected FRSE 2 March 1970; died 3 January 2010.