BIOGRAPHIES OF EMINENT SCOTTISH PHYSICIANS: PROFESSOR SIR IAN HILL

D. Emslie-Smith,[*] K.G. Lowe[†]

Sir Ian Hill, last Professor of Medicine in the University of St Andrews and first in the University of Dundee, was a very distinguished physician indeed. Although he had not the tall elegance of Derrick Dunlop or the powerful physical presence of Rae Gilchrist, his star qualities shone in any company with their own particular brilliance.

Ian George Wilson Hill was born in Lanarkshire on 7 September, 1904, the son of a banker and pioneering amateur photographer, Alexander Wilson Hill, J.P., and his wife, Jean Robertson, daughter of George Lockhart Malcolm. He spent his early childhood and very formative years in South Uist where he developed a keen interest in natural history and, encouraged by his father, in country pursuits, including wildfowling and fly-fishing. The family moved to Edinburgh where Ian was educated at George Watson's College. At the age of 15, he published his first scientific communication in *The Scottish Naturalist*, reporting the finding of Clouded Yellow butterflies on the Longniddry Links. As a senior schoolboy, he was intent on obtaining a degree in science and mathematics. However, his headmaster, Dr Allison, called in his father to see him and said, 'that way he'll finish up as a works' chemist or a schoolteacher. Why don't you make him a doctor?' The following October he became a medical student in the University of Edinburgh, in the same year as another future giant in British medicine, John McMichael. It was soon apparent that they would vie for the highest honours. However, Hill lost a whole year to illness and although McMichael generously took copies of his lecture notes to him so that his rival would not be disadvantaged, Hill graduated in 1928, the year after McMichael, having held the Senior Presidency of the Royal Medical Society. In 1928 Hill won the Shaw-Macfie-Lang Fellowship, open to competition to the graduates of all the Scottish Universities who have taken their Degree with Honours, irrespective of Faculty. Ian Hill was also awarded the Allan Fellowship for obtaining the highest marks in Clinical Medicine and Surgery in the final examination. These early distinctions favoured his introduction to academic medicine. Both men graduated with honours, each winning the Ettles Scholarship awarded to the most distinguished graduate of the year; it was as well that the examiners did not have to discriminate between them. McMichael and Hill remained friends in after years and their academic departments profited from interchanges of staff.

In his early postgraduate years Ian Hill came under the influence of Professor W.T. Ritchie (the discoverer of atrial flutter) in clinical medicine and of Sir Edward Sharpey-Schafer in laboratory research. Hill's early research was on the autonomic control of the circulation and cardiac arrhythmia, and when he was awarded a Rockefeller Travelling Fellowship, his chosen field of study was cardiology. At Ritchie's instigation, he went first to the University of Michigan at Ann Arbor to work with Frank N. Wilson, the leading world authority on electrocardiography. This choice was a wise one. Wilson was one of the three founding fathers of electrocardiography, along with Sir Thomas Lewis, the great authority on cardiac arrhythmia, and Willem Einthoven, the Nobel Laureate who invented the string-galvanometer electrocardiograph as we know it. Wilson had been one of a small group of Americans sent by the Surgeon General of the United States Army to work with Lewis at the Colchester Hospital for the care of soldiers suffering from so-called 'disordered action of the heart'. Lewis was Director and the Advisory Board consisted of Sir Clifford Allbutt, Sir James Mackenzie and Sir William Osler. There, Wilson and Sam Levine carried out research on the respiration and acid-base balance of the patients. But, more importantly, Wilson formed a lasting friendship with Lewis and they indulged their shared interest in ornithology in England in 1918, and later at Ann Arbor.

Einthoven befriended Wilson when they met in America in 1924 and, among other kindnesses, built for him a valuable electrocardiograph incorporating two string-galvanometers, so constructed that two electrocardiograms or an electrocardiogram and the heart sounds could be recorded on the same film. The machine remained in use for many years and would have been well known to Ian Hill who may well have used it in his research. In 1932, when Hill arrived at Ann Arbor, Wilson was becoming acknowledged as the leading international authority on electrocardiography and physicians and students eagerly made their way to the famous Heart Station where Franklin J. Johnston had just joined him as his research assistant.

Wilson, like Einthoven, was deeply versed in mathematics and physics. Being aware of the laws governing the distribution of electric currents generated in the interior of an extensive three dimensional conductor, such as the human body, Wilson concluded that electrocardiographic leads in which one electrode is placed directly over the heart and the other as far from the heart as possible, would possess great advantages over the limb leads then in common clinical use.

It was, of course, such work that eventually led to the adoption of the precordial lead system now used worldwide in clinical practice. Hill was welcomed into this hallowed circle. He acquired the necessary skills so that he could participate with Wilson and Johnston on this work with unipolar leads using turtle and dog hearts as experimental models. But, perhaps more exciting for Hill than this fundamental work on methodology, he also embarked on a series of experiments with his colleagues on the production of myocardial infarction in dogs by coronary artery ligation. All the results of this work by Wilson, Johnston and Hill were published in a series of papers, mostly in the *American*

[*]*Reader in Medicine, retired*
[†]*Emeritus Professor*

Heart Journal and subsequently reproduced in 1954, after Wilson's untimely death, by his colleagues, Johnston and Lepeschkin *(Selected Papers of Dr Frank N. Wilson*). Hill's part in this exceedingly important fundamental work was acknowledged by the fact that as late as 1938 he was invited to be the leading author of the last of these papers.

Hill subsequently visited Vienna and worked in Rothberger's laboratory, again on electrocardiography. While there he became fluent in German, as he had already been in French, and he greatly enjoyed the cultural life of the city, particularly its musical life; he was himself a competent amateur pianist. His interest in electrocardiography stayed throughout his life and his Gibson Lecture of 1949 on Multiple Lead Electrocardiograms was reproduced in the *Lancet* as a magisterial account that explained unipolar (V) leads to cardiologists and general physicians in the United Kingdom. Electrocardiography was to be an important field of research in his own department in Dundee.

On Hill's return to Scotland, Stanley Davidson was Professor of Medicine in the University of Aberdeen. With his flair for recognising promising young men, he appointed Ian Hill as a Lecturer in Medicine. He remained in Aberdeen until 1937 when he returned to Edinburgh to become Lecturer in Therapeutics with Derrick Dunlop. He was appointed Assistant Physician at the Royal Infirmary, Edinburgh, in 1938.

Ian Hill's academic and clinical career was interrupted by the Second World War. An active territorial soldier, he was mobilised at its outbreak and served throughout, first as Officer in Command of Medical Divisions in Military Hospitals in the UK, Middle East and India, and later as Consulting Physician to the XIVth Army in Burma and later to the Allied Land Forces, Southeast Asia with the rank of Brigadier. After the fall of Mandalay, Hill met General Slim (later Field-Marshal Viscount Slim) who, noticing that the XIVth Army shoulder flash had been replaced by that of ALFSEA, jokingly accused him of 'desertion'. For his services in this field he was appointed CBE in 1945. At the end of the war he resumed his appointment at Edinburgh University and became Physician at the Deaconess Hospital. In 1948 he was elected to the Royal Society of Edinburgh. He also quickly established a successful private consultant practice but sacrificed that in 1950 to return to academic life, when he succeeded Adam Patrick as Professor of Medicine in the University of St Andrews.

Adam Patrick was a wise and kindly physician dependent largely on private consulting practice. He had done important bacteriological research in the Mediterranean area during the First World War. Erudite, with a classical background, and much loved, he gave daily lectures, and is remembered for his meticulous history-taking, for performing his own side-room testing (blood counts, urinalysis, etc.,) even in private consultation, for his rather dull lectures and for his indecipherable handwriting. Hearing that he was about to retire, his former students who had academic interests hurried back to Dundee to sit the clinical part of the MD degree examination before 'the new man' arrived.

Ian Hill inherited a large bed complement of five medical wards spread over the Dundee Royal Infirmary, Maryfield Hospital and the Arbroath Infirmary. There was one NHS Consultant, one Senior Lecturer and junior staff. Hill had a remit to create a modern-style academic unit and, in his usual dynamic way, he achieved this within about three or four years. A second, and later a third, Senior Lecturer, and a second NHS Consultant were appointed. With inexhaustible energy he set new standards of lecturing, clinical instruction and clinical care and fired his academic, medical and nursing staff with enthusiasm.

The Medical School had previously been well served by its clinical staff except in one regard: hitherto there had been practically no clinical research. That, however, was about to change. Naturally, Hill had decided on cardiac research as his first priority, and this had added importance because of the need to develop cardiac surgery. The Departments of Surgery, Anaesthetics, Paediatrics, Radiology and Anatomy were brought into co-operation with the Department of Medicine for clinical and research purposes. When he arrived in Dundee in 1952/3, he had already found a room adjacent to his wards in DRI suitable for the cardiac investigation and pressure-recording apparatus that had been acquired. Apparatus for blood oxygen-saturation estimation was assembled and right-heart catheterisation began that summer in the pre-operative assessment of patients with rheumatic and congenital heart disease. When John McMichael visited Dundee he was impressed to see that Hill had instituted routine ECG monitoring of the procedure - certainly not routine at that time.

Looking for a research field pattern, his staff chose first intracardiac electrocardiography using electrode-tipped cardiac catheters. The patterns in the normal heart, ventricular hypertrophy, bundle-branch block and ventricular pre-excitation were studied. The combination of the intracardiac ECG and pressure pulse cast light on the varieties of pulmonary stenosis. At a later date the most exciting intracardiac ECG work was the search for evidence of conduction along the bundle of His. When this was eventually found and recorded in a patient with tricuspid valve anomaly and reported in the *American Heart Journal*, it was immediately followed up in America. There, with more sophisticated apparatus, it became a routine procedure known as His Bundle Recording. There followed a flood of research papers that cast much light on cardiac arrhythmia and heart block, and led in time to the current treatment of some arrhythmias by ablation. Angiocardiography was developed with the help of Dr C. Pickard's Radiology Department and this soon led to the experimental introduction of selective cine-angiocardiography with image intensification, particularly useful in assessing congenital heart disease.

Frank Wilson had introduced and named vectorcardiography but there was little interest in it in Britain. One of us (D.E-S) spent a year in Melbourne with a Travelling Fellowship, learned more about the technique, and on his return to Dundee collaborated in further studies on myocardial infarction, atrial arrhythmias and the effect of posture on the surface ECG.

In Melbourne he had also made a special study of the ECG in experimental hypothermia. This bore fruit in a most unexpected way on his return to a cold winter in Maryfield Hospital. Routinely reporting on ECGs, he recognised cases with characteristic ECG patterns of hypothermia and by recording rectal temperatures with a laboratory thermometer he confirmed the diagnosis in acute admissions. This clarified the clinical picture of accidental hypothermia and its importance in the community was emphasised. In subsequent years, accidental hypothermia

was studied in all aspects and papers and a monograph were published.

Hamish Watson had concentrated his attention on children with congenital heart disease and had published a textbook on the subject. He played a prominent rôle in establishing the European Society of Paediatric Cardiology and became its first President. When John Stowers joined the staff from UCH, he brought with him a flame photometer - the first to be used in Scotland. This aided research in electrolyte metabolism. He also built up a special diabetic service for Tayside before leaving for a post in Aberdeen. K.G.L., with the help of the Department of Clinical Chemistry, established a Metabolic Clinic with a research interest focussing primarily on calcium metabolism, particularly infantile hypercalcaemia and resistant rickets. When W.K. Stewart was appointed Senior Lecturer, he took over the work on renal disorders and went on to establish a superb Dialysis Unit.

Meanwhile, Professor Robert Hunter (Therapeutics) was building up his staff and developing the subspecialties of Haematology, Endocrinology and Respiratory Medicine. A notable lack remained, and this was evidenced by the fact that neurosurgical emergencies had to be referred to the centres in Edinburgh and Aberdeen. When Andrew Lenman joined the staff, he built up a neurological service with such ancillary aids as electromyography and sophisticated electroencephalography. There followed the establishment of a neurosurgical service centre in the region which also excelled.

But Ian Hill, unselfishly, had a wider vision for enhancing the reputation of the Medical School in Dundee. Seeing the urgent need to provide care for the frail elderly, he encouraged the Regional Hospital Board to take a decisive step and appoint the first NHS Consultant Geriatrician (O. Taylor Brown) in Scotland. He gave him unstinted help in developing this pioneer service. Other advances in the region were the setting up of a modern style Department of Social Medicine (Professor Alec Mair), and exciting developments in Psychiatry (Professor Ivor Batchelor). Both these departments were strongly supported by Hill.

In his Harveian Oration of 1960, Hill said:

> Commonly a man's best original work is done in his early years. With middle age many an enquiring mind congeals; ideas come slowly if at all, and the zest for experiment languishes. And if the springs of inspiration run dry where shall the individual turn for a livelihood in his later working years? Is he to be put out to grass like a point-to-pointer past his prime; or harnessed like a cab horse in humdrum practice or administration? Or in desperation stalled - in a Chair?

For Ian Hill, a Chair was not a stall but a rocket launcher and with his personal research now behind him, the rocket contained the inseparable elements of astonishing clinical practice, superb teaching and the encouragement of his staff. He was a master clinician over the whole field of medicine. His approach to cardiac problems used the discipline of the 'four-fold' diagnosis but in General Medicine he had an almost intuitive ability to reach the correct diagnosis even in the most difficult of circumstances. He remembered patients, not so much by name, as by their faces and the circumstances that had led to their previous admission to his wards. He was deeply concerned for them and treated all classes in exactly the same way.

He set a stimulating example for his junior staff, often arriving on the ward in the morning before they had washed, or summoning them to see a patient with him when they were going to bed, or even when they were asleep; it was impossible to keep him out of the wards. The hours of work and the commitment that he demanded were never regretted by those who worked with him, for he set very high standards. 'You know my methods,' he said, 'apply them'. Those who followed this advice captured some of the qualities of their chief, some reaching the highest positions in British medicine.

Ian Hill believed that it was the duty of a Professor to teach and he never stopped doing so, whether formally or by example. He expected his staff to do the same. Every morning during the University term, systematic lectures covered the whole of Medicine. He usually gave these lectures himself, alerting his drowsy undergraduate audience by an entry so dynamic that 'the doors of the lecture theatre seemed to close behind him as if by suction'. His lectures were vivid and peppered with anecdotes. He believed in what was said of Professor Noah Morris of Glasgow: 'It was his firm conviction that the teacher had failed in his intentions if at the end of his discourse he was not mentally exhilarated and physically exhausted'. When other commitments prevented him from giving these lectures, to which he attached great importance, the duty fell to his Senior Lecturers. He expected them to emulate his high standards, but it was difficult. Sometimes our telephones would ring late in the evening and the well-known voice would say 'I'm at Waverley Station catching the night train to London. Could you do the 9 o'clock lecture tomorrow? I got as far as bronchiectasis'.

He taught all the time in his ward rounds, which were held in the old style: the Chief, the Ward Sister, the Sub-Chief, Senior and Junior Registrars and Housemen, and an inevitable tail of postgraduate students, many from overseas. Every week he held a memorable clinical demonstration in the clinical lecture theatre at DRI, attended by undergraduate and postgraduate students and many General Practitioners. Here he excelled himself. Patients selected for this demonstration never resented it and his kindness and courtesy to them made many of them enjoy the experience, while his audience was stimulated and encouraged to participate. As was said of Socrates, Hill combined the best qualities of the midwife and the gadfly.

Another weekly event was his outpatient cardiac clinic, also held in a small lecture theatre with a smaller but similar audience present. His junior staff attended, of course, but his university secretary was also present, taking shorthand notes. He elicited the history from each patient and then demonstrated the physical signs; the ECG was inspected and then he and a few of his more senior staff donned dark glasses. When their eyes had accommodated, Hill screened the patient's heart fluoroscopically, in the PA, and right and left anterior oblique positions. Then followed the four-fold diagnosis: aetiological, anatomical, physiological and the 'cardiac grade'. With this framework he found answers to the four important questions regarding a patient's cardiac lesion: (1) what is its cause? (2) what is the anatomical flaw and where is it? (3) what is the rhythm? and (4) how are his activities affected? In these clinics, the letter to the referring doctor was more or less dictated to his secretary as he went along.

Even in university holidays, the teaching went on. For

many years in the Easter vacation he and his senior staff ran postgraduate cardiology courses which were eagerly attended. They meant a great deal of hard work for his staff but were much appreciated by the attending postgraduates, many of whom were from overseas. In addition to these courses, various symposia were organised during his time in Dundee. They were all on cardiological topics and attracted such international figures as Dr R. Heim de Balsac, Dr Howard B. Burchell of the Mayo Clinic, Dr Edler of Lund (pioneer in echocardiography), Professors Snellen and Durrer from Holland, and many distinguished cardiologists from London, Oxford and other cardiological centres in the UK. These meetings helped to consolidate the reputation of Dundee as a distinguished cardiological centre. The improved status of the Medical School was such that Hill was able in 1962 to bring the Association of Physicians of Great Britain and Ireland and the British Cardiac Society to St Andrews and Dundee for the first time.

Ever since he had left Edinburgh for Dundee, Ian Hill had retained both interest and activity in the Royal College of Physicians of Edinburgh and served on its Council and then as its first President furth from Edinburgh (1963-1966). This was a time when much thought was being given to improving undergraduate teaching and postgraduate training in the United Kingdom and to problems in the Health Services of the poorer Commonwealth countries and the postgraduate training of their doctors. There was, too, a clamant need for improvement in the design and conduct of the Membership examination and harmonisation between the examinations in Edinburgh, Glasgow and London. To all these matters, and in the related Committee work, Ian Hill brought wise counsel. But perhaps his most important service to the College was his extensive overseas travel on its behalf. Between 1956 and 1961, he travelled as Visiting Consultant in Medicine to Hong Kong, Malaya and Borneo. Craig's History of the College pays tribute to his travels on its behalf to Australia, Malaya, Singapore, India, Burma, Ceylon, East and North Africa and the Sudan. Hill gave many lectures overseas, and held honorary memberships of several overseas cardiac societies and of the Academy of Medicine in Singapore. He had a deep sympathy for the Third World and disadvantaged doctors who worked there. He always spoke on their behalf and welcomed them to Dundee to work on his staff or to attend postgraduate courses.

In 1956, Ian Hill had been appointed Honorary Physician to the Queen in Scotland; in particular, he had responsibility when members of the Royal Family were in residence at Balmoral. Hitherto this had been the responsibility of physicians in Aberdeen as the nearest Medical School centre, but such was Hill's pre-eminence as a Consulting Physician that he was the natural choice. Until 1970 he served loyally in the Royal Household and was well known to members of the Royal Family. It was therefore entirely appropriate that during his Presidency of the College, Her Majesty the Queen and the Duke of Edinburgh graced a College reception, during which the Royal Visitors mingled with Fellows and their wives in the College Hall. It was a splendid and memorable occasion and marked the climax of his Presidency (Figure 1). He was Knighted in 1966 for Services to Medicine.

A year later he was Visiting Professor of Medicine in McGill University, Canada, and after he retired in Dundee in 1969, he continued to work and to travel. He was Visiting Professor of Medicine in the University of Teheran from 1970 to 1971, the University there requiring a candidate able to answer questions in French and German! In the following year he served as Dean of the Faculty of Medicine in the Haile Selassie University in Addis Ababa. In 1970, the University of Dundee bestowed on him the honorary degree of LL D. It was a just reward for one who had done more than any other to establish its Medical School as a viable and prestigious institution. A more intimate appreciation by his staff and former students took the form of a specially commissioned portrait in oils by the distinguished Dundee artist, Alberto Morrocco. The three-quarter length portrait of him, wearing the gown of the President of the Royal College of Physicians of Edinburgh hangs in the Library of the University of Dundee's Medical School (Figure 2), facing a portrait of David Kinloch, Physician to King James VI of Scotland. A second, head and shoulders, portrait hangs in the Davidson Room in the College.

FIGURE 1
H.M. The Queen, Patron of the Royal College, with Sir Ian Hill, President, at the Reception in 1966.

Ian Hill was short and slight, but his military bearing, superabundant energy, ceaseless striving, penetrating intellect, erudition and witty repartee, commanded attention in all circles. He was a frontline fighter, not a backroom diplomatist. Fearless in his beliefs, he did not hide his contempt for pretension or his irritation at incompetence. But the rather prickly manner concealed - perhaps too well - a sensitive and warm-hearted man, deeply compassionate, who inspired loyalty and returned it. In Vienna, Wenckebach once said to him, 'Cardiology is your first love; it will be your last love'. And so it was: his last

FIGURE 2
The portrait of Sir Ian Hill by Alberto Morrocco.

paper in a medical journal in 1980 surveyed the treatment of heart disease over half a century. It may have given him secret satisfaction to reflect that in that time he had brought hope and succour to many thousands of patients of all ages afflicted with heart disease.

He married, in 1933, Ellen Audrey Lavender who had trained as a nurse at Edinburgh Royal Infirmary. They had one daughter and one son, Alasdair, whose appointment as Q.C. gave Sir Ian much pleasure. Throughout his career, Ian Hill and his wife Audrey had been prodigal in their entertainment of colleagues, staff and students. Sadly, Audrey died in 1966 after a lengthy period of ill-health. In 1968 he married his second wife, Anna, who was his constant companion on his overseas travels and duties, and later gave warm support in his declining years in Crail. There they had a charming cottage with a lovely view of the sea and were welcoming hosts to old colleagues and friends, particularly former students, both undergraduate and postgraduate, who might arrive from anywhere at home or abroad. His mind was clear to the end. On 5 May 1982, as was his wont, he had completed the Times crossword and then had a surprise visit from one of his most distinguished and grateful students, who as a young house-physician had been sent to Hammersmith Hospital where he had an outstanding career, eventually succeeding Ian Hill's old friend John McMichael. After that happy day, Ian died suddenly on his way to bed.

Sir Ian could speak with authority, wit and erudition on any occasion. He was a popular after-dinner speaker. He would prepare his talk, have his secretary type it and take it with him on the occasion, but rumour had it that he would tear up the script as he advanced to the podium. He addressed the Harveian Society, innumerable dining clubs and medical gatherings, and he took particular pride in giving eponymous lectures such as the Gibson Lecture in Edinburgh, the Carey Coombs Lecture in Bristol and the Wilson Memorial Lecture in Ann Arbor. On these occasions he could distil his essential philosophy about what a physician and a cardiologist should be. In his Wilson Memorial Lecture he said:

> In the last analysis the cardiologist is a physician specially skilled in the handling of patients with cardiac disease. Note that I have said 'in the handling of patients with cardiac disease'.

He is not simply a physiologist who probes the intricacies of haemodynamics or gas exchange, or of altering metabolism of fats and lipids; he is not simply a pathologist who knows about inflammatory and degenerative processes in the heart valves, heart muscle and vessel walls. He is first and foremost a practising doctor charged with the welfare of individual human beings. He must bring to the management of such patients all the knowledge and specialised skill which he can acquire. He must bring also his undivided attention to the individual problem of this particular patient. Lastly he must have an understanding of the man in his relation to his environment, his family, his problems and his individual response to the medicaments at our disposal.

Nor is this really the complete answer to the training of a cardiologist. It is implicit that he must be a broadly trained doctor; he cannot practise cardiology in a medical vacuum. He must have a wide knowledge of internal medicine so that confronted by what purports to be a cardiac patient he may be able to discern that he is suffering from an unrelated disease, of thyroid, lungs or what have you.

And he went on to quote from Sir Hector Hetherington, Vice-Chancellor of the University of Glasgow: 'liberality and largeness of the mind are as much a necessary attribute of a good doctor as the solidity of his technical equipment, for he must command the apparatus of his calling and know how to use it in the service of his fellow men'.

And that is how we remember him.
