
Sir Colin Dollery


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SIR JOHN McMicheal
25 July 1904—3 March 1993
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BY SIR COLIN DOLLERY

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A quote that says much about JOHN McMICHAEL comes from his own autobiographical notes: ‘I come from a materially poor branch of a Galloway family’. He was born on 25 July 1904 in Gatehouse of Fleet, Kirkcudbrightshire, Scotland, son of James and Margaret McMichael. There were two older sisters and two elder brothers, and he was something of an afterthought. His father ran a farm on the edge of the village and was also the local butcher. A ‘God-fearing, generous man’, he was not a good manager of his limited resources.

Until he was ten years old John McMichael went to a school run under the patronage of the Lady of the Manor; but in 1914 this school was closed and he transferred to Girthon public school under its headmaster, William Learmonth, who was to have a major influence on the young McMichael. Learmonth’s son, eight years McMichael’s senior, became Sir James Learmonth, the well-known surgeon. Learmonth was an exceedingly capable teacher to find in a small village school and his pupils clearly felt the benefit. At the age of 14 there was a debate in the McMichael household about the next stage in John’s education. His mother, supported by Learmonth, decided he must continue and he moved to Kirkcudbright Academy, eight miles away, a hard and hilly bicycle ride. Here he blossomed, taking first place in most subjects, and ending up as Dux of the school. His decision to read medicine was influenced by two chance factors. He often spent his holidays with a fisherman on an island in the Fleet Bay where the solitary house was occupied by a doctor from the Indian Medical Service during his leaves. On wet days his medical books opened up exciting prospects in the schoolboy’s enquiring mind. During World War I a maternal cousin, Col. George Home, C.B.E., M.D., of the New Zealand Army Medical Corps, spent his leaves with the family and kindled a broad interest in science and medicine.

A local and Carnegie scholarship took him to Edinburgh University. His initial reaction was one of bewilderment and he wrote to his mother that the inhabitants of Edinburgh must be very wicked because they played golf on a Sunday! Exposed to public school boys and
other sophisticated children from the city he felt out of place. Too poor, shy and priggish (his words) to take an active part in university social life he settled down to hard study. The drill of learning anatomy by rote he found soul destroying. Physiology under Sir Edward Sharpey-Schafer was more exciting, but Schafer was ageing and the rest of the staff seemed second rate. He quickly gained confidence, fuelled by a John Aitken Carlyle scholarship which enabled him to study for a short time at St Bartholomew's Hospital under the newly appointed Professor of Physiology, Lovatt Evans, and to obtain his primary F.R.C.S. His clinical studies at Edinburgh excited him but his comments about his teachers showed his critical insight. Of one he remarked that he was ‘flamboyant and dramatic, seldom hesitating to modify a patient's history to make it fit a lesson’. Sir David Wilkie was a powerful influence and McMichael remarked that he was ‘patient, realistic and faced honestly the embarrassments of insoluble problems and his own errors’. Cushny too was a splendid teacher in pharmacology, and Lorrain-Smith’s organized case instruction in pathology set a pattern for later clinico-pathological conferences. By now McMichael had overcome his shyness and became, in time, Secretary of the Royal Medical Society. He graduated in 1927 with honours, the Ettles Scholarship and the Leslie Gold Medal in Medicine.

He could not afford to apply for an unpaid residency at the Edinburgh Royal Infirmary and instead took a house physician’s appointment at Bradford Royal Infirmary under Dr F.W. Eurich. He moved on to Paddington Green Children’s Hospital in London with Dr G.A. Sutherland and Dr R. Miller, receiving notable encouragement from his consultants in both places. In 1929 he returned to Edinburgh to be Wilkie’s house surgeon and it was this appointment that launched his academic career. Here he undertook his first research on ‘Splenic anaemia’ which later became the subject of his M.D. thesis. Stanley Davidson, 10 years McMichael’s senior, was also working in Wilkie’s laboratory and, in 1930, when Davidson was appointed Regius Professor in Aberdeen, he asked McMichael to accompany him as an assistant, supported by a Beit Memorial Fellowship.

Aberdeen

When they arrived in Aberdeen there were no facilities at all, apart from a lecture theatre, and setting up an experimental laboratory was a struggle which did not attract much local help, although Professor J.J.R. Macleod was most supportive. In addition to continuing his interest in the inter-relationships of disorders of the liver and spleen, McMichael carried out physiological experiments in the cat and the dog, collaborating with J.M. Peterson, on the regulation of venous pressure and flow in the portal venous system, and the action of adrenaline and acetyl choline. He showed that, particularly in relation to adrenaline, the physiological connections between the hepatic artery and the portal ramifications in the liver were regulated in the same way as those between the mesenteric arteries and veins in the intestine. Pituitrin was shown to produce a long and intensive constriction of the small vessels of the intestine and a long-lasting reduction of portal pressure - a result which many years later was of relevance to the control of haemorrhage from venous varices in cirrhosis of the liver. Using a liver plethysmograph in vivo he concluded that active dilatation of the liver was possible and he even speculated that liver enlargement in heart failure might be a kind of physiological venesection. He corresponded actively with John McNee in London describing his experimental results, his personal situation ('I am too much on my own here and it gets very depressing from time to time') and the development of his career. His letters show that
besides feeling isolated he doubted whether he, as an experimental scientist, could break into the tightly organized world of hospital medicine. He sought advice as to whether he should consider a move to the south, ("Will the vicious circle of vested interest in appointments to hospital staff be as difficult to break in London as in Aberdeen?"). Macleod suggested that McMichael should go to work with Sherrington and then seek a Rockefeller Fellowship. McMichael was excited by the prospect and wrote to McNee, ‘It is definitely committing myself to academic and experimental medicine. The prospects in this field are limited at the moment but I feel they are bound to widen’.

**LONDON (1932–34)**

In 1932 McMichael came to London to work in Professor T.R. Elliott’s Medical Unit at University College Hospital (UCH). UCH at that time was the leading clinical research centre in Great Britain, and McMichael was brought into contact with notable figures such as Sir Thomas Lewis, George Pickering, H.P. Himsworth, E.J. Wayne, F.H. Smirk, G. Payling-Wright, G.R. Cameron, C.L. Cope, and also the staff of the Department of the University College London Physiology Department under Lovatt Evans. The immediate attraction was the offer by J.W. McNee to put at McMichael’s disposal his large pathological collection of enlarged spleens; and joint studies on these resulted in the recognition of a new group of cases which were named leuco-erythroblastosis, on which there was useful information on the natural history of the disease. Study of this collection also enabled McMichael to complete his M.D. thesis for which he was awarded a Gold Medal by Edinburgh University in 1933. McMichael also joined Smirk, who had developed an ingenious method for measuring the rate of absorption of water, in experiments designed to see whether experimental portal congestion would delay water absorption in rats. Although the answers were positive, attempts to apply water absorption as a test for portal hypertension in patients with cirrhosis of the liver were unsatisfactory. By 1934 McMichael’s research interest in venous pressure was switching from the portal circulation to the more general problem of systemic venous congestion and thus to heart failure. He realized that to investigate the problem in man required a reliable method of measuring cardiac output, and decided to use the Grollman acetylene technique. Professor Samson Wright taught him the standard method; but this was unsatisfactory because the acetylene gas was soluble in the carbon dioxide absorbent in the Haldane gas analysis apparatus. Discussions with Samson Wright resulted in the construction of a modified Van Slyke manometric apparatus, using larger gas samples and a small volume of concentrated caustic soda to absorb \( \text{CO}_2 \). This method was laborious and not entirely satisfactory but it enabled useful and repeatable measurements to be made.

**EDINBURGH (1934–38)**

When his Beit Fellowship expired in 1934, McMichael returned to Edinburgh as a Lecturer in Human Physiology. Here he was faced with a large teaching load and yearned for clinical contacts; moreover his time for personal research was severely restricted. Initially he carried out experimental work on the hepatic circulation and the relative importance of portal and arterial blood in the oxygen supply to the liver. But he also continued his research on cardiac output using his modified acetylene technique. Opportunities increased when he was awarded a Johnston and Lawrence Research Fellowship by the Royal Society for research in
cardiology, and W.T. Ritchie, then Professor of Medicine, secured for him a post as an extra Assistant Physician with entrée to the wards of the Royal Infirmary, with Professor Derrick Dunlop providing laboratory space. It was then that McMichael began his research on congestive heart failure, a field in which he was to make a major contribution.

Using the acetylene method, McMichael showed that patients with severe heart failure (New York Heart Association Grade III) had a cardiac output that was about half the value observed in normal subjects in spite of a raised venous pressure. The postural increase in heart output on changing from the erect to the supine position seen in normal subjects was diminished and then almost disappeared as cardiac failure progressed. He wondered whether the failing human heart behaved like the over-distended mammalian heart in the experiments of Starling (1918) and Wiggers and Katz (1922) in which any further rise in venous pressure did not produce an increase in the cardiac output, which might even diminish. But he was puzzled that in mild congestive failure patients might still increase their heart output on exercise; and in one case venesection reduced the output. He did not receive much encouragement from his peers. His first paper on postural changes in cardiac output, submitted to Clinical Science, was returned by the editor, Thomas Lewis, with a curt note to the effect that readers of Clinical Science were not interested in the cardiac output.

It was a natural progression from use of the acetylene method, with its problem of distribution in the lung, to apply the method to pulmonary physiology and with F.J.C. Herrald he extended his studies to measurements of residual lung volume. The usual method at the time was to measure oxygen dilution in a closed spirometer system but this was unsatisfactory because the respiratory quotient was less than one. A better measure could be obtained by maintaining a flow of oxygen into the spirometer to keep the volume roughly constant, but it was a difficult technique to use in practice. Following a suggestion of A.J. Clark, McMichael devised a method using the dilution of hydrogen in the circuit. Because of the safety hazard, helium was later substituted, and this became the standard method of estimating residual lung volume.

The gas dilution method for estimating lung volume saw practical application when, at the request of the Medical Research Council (MRC), McMichael joined P. d'Arcy Hart and E.A. Aslett in making a study of the respiratory disablement of some 500 miners at Ammanford in South Wales.

Hammersmith Hospital and the Postgraduate Medical School

In 1935 Francis Fraser had established the Department of Medicine at the British Postgraduate Medical School at Hammersmith Hospital. Besides recruiting a talented group of research-minded physicians, Fraser made two crucial decisions. The first, based on his experience at the Rockefeller University in New York, was to create an academic hospital with the majority of senior clinical staff paid by the university. The second, was that, rather than being a crammer for overseas doctors seeking higher medical training, the school should stake its reputation upon research.

In late 1938 Robert Aitken, one of the founding group of physicians, left Hammersmith and Francis Fraser, a noted talent scout, persuaded McMichael to apply for the vacant Readership. That move was to prove crucial for McMichael’s own career development and for Hammersmith, although it did not appear so at the time. War was looming. In September 1939 Francis Fraser left to set up the Emergency Medical Service and most of the other physicians (Paul Wood, Guy Scadding and others) joined the armed services. Fraser told
John McMichael that he must stay and look after the Department. So at the young age of 35, John McMichael found himself in effective charge of the Department of Medicine and one of the most influential figures in the Postgraduate Medical School.

The war years were difficult, although West London was spared the worst of the bombing. It was during this time that his research partnership with E.P. Sharpey-Schafer was formed and they initiated their research on cardiovascular disease using cardiac catheterization. While McMichael was a formidable intellect and determined, Sharpey-Schafer was quick witted and highly innovative. They made a good team. The year 1944 was exceptionally difficult for the department as four members of the medical staff went down with tuberculosis, including Sharpey-Schafer and Sheila Sherlock. Despite all these difficulties, during the war years Eric Bywaters carried out seminal work on the ‘crush syndrome’, a form of renal tubular necrosis developing in people whose limbs had been crushed under rubble in bombed buildings; McMichael and Sheila Sherlock, with J.H. Dible in pathology, were among the first to use the technique of liver biopsy.

After the war Francis Fraser went off to become the first Director of the British Postgraduate Medical Federation and, in 1946, McMichael was appointed to succeed him as Professor of Medicine. He continued Fraser’s policy of recruiting young people and giving them their head, which gave his department at Hammersmith a vivacity and sense of discovery that was not to be found elsewhere in British medicine at that time. John McMichael with a small number of other very talented people (Earl King, John Dacie, Ian Aird) turned Hammersmith from an undistinguished London County Council hospital into a world centre of medical research within a remarkably short time. Sir Harold Himsworth, when naming a new laboratory after Francis Fraser in 1968, remarked ‘within the last quarter century a miracle has happened here’ and went on to say that, in his opinion, there had been two crucial ingredients in that miracle: first, the organization of both school and hospital on strict academic lines and second, the decision to stake the future on the advancement of knowledge. Fraser laid down the policy, but it was McMichael who largely carried it out.

**CARDIAC CATHETERIZATION**

The procedure of cardiac catheterization was first carried out in 1929 by W. Forssmann on himself. The technique was used increasingly in the 1930s for pulmonary angiography; but it was A. Courmand and H.A. Ranges who published in 1941 the first series of cases in which cardiac catheterization had been used to make accurate and sequential measurements of cardiac output in man. They applied the direct Fick principle, which depended on obtaining samples of mixed venous blood from the right heart, calculating the arteriovenous oxygen difference, and measuring oxygen consumption by spirometer.

McMichael and Sharpey-Schafer established the technique at Hammersmith in 1942. Their technician, Arthur Latham, recalls that he was sent to the Urology Department to obtain a nr. 10 ureteric catheter which was the only sterile radio-opaque catheter available in the hospital! Seventeen male volunteers from the Friends Ambulance Unit had a catheter introduced via a forearm vein into the right atrium, in which pressure was measured using a citrated water-filled manometer to keep the catheter free of clot. These initial studies established the feasibility of the method and gave normal resting values for arteriovenous oxygen difference; showed that cardiac output was higher in the supine than in the erect posture; and that a fall in right atrial pressure (RAP) (produced by inflating cuffs on the thighs) reduced,
and a rise in RAP (by saline infusion) increased cardiac output. The effects of atropine and adrenaline were also recorded. In this wartime era, Sharpey-Schafer had previously been carrying out work on the effects of haemorrhage and transfusion, and McMichael was the Secretary of the MRC Wound Shock Committee. It was appropriate that the cardiac catheterization technique should be employed to observe the effects of venesection on volunteer blood donors in whom (especially with larger venesections) a vasovagal faint, with pallor, sweating, a sudden marked fall in blood pressure and bradycardia, was not uncommon. Collaboration with Henry Barcroft and O.G. Edholm, who used venous occlusion plethysmography to measure forearm blood flow, unravelled the mechanism of the fainting reaction: the acute fall in blood pressure was shown to be due to a vasodilatation in muscle blood vessels mediated by vasomotor nerves, and not to a fall in cardiac output. These studies, presented to the Physiological Society in 1943 and published in 1944, sent shock waves through medical London, as many physicians regarded the technique as unethical, even immoral. But McMichael and Sharpey-Schafer, convinced of the safety and the value of the method, pressed on. The concept that cardiac output was always depressed in cases of heart failure with a raised venous pressure and congestion of the lungs was shown to be invalid. Sharpey-Schafer (1944) reported that cardiac output was increased in cases of severe anaemia with congestive heart failure; and this was followed by papers from Hammersmith on ‘high output heart failure’ in widespread Paget’s disease of bone, arteriovenous aneurysm and emphysema. Studies on ‘low output heart failure’ from valvular, ischaemic and hypertensive heart disease were also published, with the effects of treatment by venesection, digitalis and theophylline-ethylene-diamine. The value of cardiac catheterization as a diagnostic procedure in various forms of congenital heart disease was also described.

After the successful introduction of the surgical treatment of congenital and valvular heart disease by Blalock, Brock and others, the technique of cardiac catheterization became not only respectable but essential; and with specially manufactured catheters from the U.S.A. and sophisticated pressure-measuring and recording devices it developed into a standard diagnostic method used by cardiologists throughout the world.

**The Pharmacology of the Failing Human Heart**

In this slim book of just 59 pages published in 1950 McMichael reviewed results from relevant studies on various forms of heart failure carried out by him and his team over the preceding eight years, and corresponding work reported from elsewhere. In the light of these a revision of previous concepts was needed, and he tentatively proposed a definition of heart failure as ‘the heart is failing when its capacity to increase output is seriously impaired and when output is only maintained at the expense of a raised venous filling pressure; the late stages are characterized by an output which is falling below the previous level, with further increase in systemic venous congestion’. He extrapolated from the results of Müller in the isolated mammalian heart that an increased work load created by a raised minute volume is tolerated very much better than a similar work load imposed by an increased arterial pressure. The relevance to the failing human heart of Starling’s Law of the Heart (as modified by Wiggers) – a law which relates filling pressure to cardiac output in the isolated mammalian preparation – had intrigued him since 1938–39, when he had invoked the idea of a ‘compensatory’ rise in venous pressure. Early studies with Sharpey-Schafer on the response of cardiac output in man to changes in venous pressure induced by venesection and infusion had
shown changes in the direction predicted by Starling’s Law, although the magnitude of the changes was variable. Further evidence was the increase in cardiac output seen in cases of congestive heart failure after venesection had produced a fall in right atrial pressure, suggesting that they lay on the overloaded or falling limb of the ‘Starling curve’. Mercurial diuretics had a similar effect. Theophylline–ethylene–diamine was remarkably effective in heart failure cases by reducing rapidly right atrial pressure and increasing cardiac output; but McMichael remarked ‘the increased strength of contraction of the heart after theophylline is so striking that it seems unfortunate that this action cannot be prolonged’ – a sentiment shared by anyone who has engaged in studies of new cardiac inotropic agents.

Discussion of the effects of digitalis and related cardiac glycosides take up the largest part of the book. Early studies with Sharpey-Schafer had shown intriguing similarities between the effect of digitalis and the response to venesection; and the suggestion was made that the major benefit of digoxin might result from a peripheral action on venous pressure e.g. by relaxation of venomotor tone. However, the cardiac work done when the venous pressure fell was greater than that which occurred when a similar reduction in venous pressure was brought about by venesection. This suggested that direct myocardial stimulation was taking place even at this early stage. McMichael correctly deduced that digitalis glycosides had a favourable effect upon the failing heart in sinus rhythm as well as in atrial fibrillation.

It was to be years later, and only after large scale randomized controlled trials, that a consensus developed concerning the beneficial action of digoxin in patients with heart failure who were in sinus rhythm.

A limitation on these early studies was that the period of observation was only an hour and most of them were carried out with intravenous digoxin, whose onset of action is slow. Pharmacokinetics as a science was in its infancy and McMichael was somewhat perplexed by the differences in response to digoxin and ouabain (whose onset of action is faster). He attempted to classify conditions in which the various actions of digitalis might or might not be expected to occur. He found the results with digoxin in patients with heart failure secondary to chronic lung disease (cor pulmonale) confusing. The cardiovascular effects of emphysema with severe carbon dioxide retention had not been worked out at that time, although McMichael recognized that patients with severe failure caused by cor pulmonale could benefit from digoxin, while milder cases did not and might even deteriorate. With the advent of continuous optical manometric recordings from the right atrium, right ventricle and pulmonary artery, the simplistic view of the Starling model as the major factor in interpreting the relationship between venous pressure and cardiac output had, in his view, to be minimized if not abandoned. Although Braunwald later showed that the exposed human heart at operation following autonomic blockade obeyed the Starling principle with great precision, the patients McMichael was studying had an intact sympathetic nervous system and this was the crucial difference. McMichael and Shillingford later pointed out that in some cases of severe heart failure functional tricuspid incompetence was yet another factor that had to be taken into account in interpreting results.

LIVER DISEASE

During the war epidemic jaundice threatened to become a scourge, and McMichael adopted the technique of liver biopsy, previously shown to be practicable by Roholm and Iversen in Denmark, to clarify the pathology. The findings of work carried out with J.H. Dible and Sheila Sherlock revealed severe damage to the liver lobules in infective hepatitis, often
amounting to 50% destruction of liver cells in severe cases. Serum jaundice patients showed a similar pattern. Dible and McMichael also showed that the pathology of jaundice occurring during the arsenical treatment of syphilis was similar to that seen in epidemic jaundice.

**Hypertension**

In the early 1950s John McMichael abandoned personal research on heart failure, although he took a keen interest in the work of John Shillingford who had joined the department to carry out research on haemodynamics. His own interests shifted to severe hypertension. There seem to have been two reasons for this. The first was the work of Horace Smirk in New Zealand, who had shown that ganglionic blocking drugs could have a profound effect upon the course of malignant hypertension. The second was that his second wife, Sybil, had developed severe hypertension which was ultimately to cause her death from a cerebral haemorrhage.

In 1950 McMichael established at Hammersmith a special clinic for the treatment and follow-up of ambulant patients with severe and malignant hypertension. With the earlier anti-hypertensive drugs, the side effects of treatment could be more intolerable than the disease itself; but the early results from the clinic were encouraging and showed an average prolongation of life of some seven years. As more acceptable drugs became available, the scope and scale of the clinic increased. C.T. Dollery and his team carried out a series of studies on the clinical pharmacology of the anti-hypertensive agents used. With Priscilla Kincaid-Smith, McMichael and Murphy published an authoritative paper on the clinical course and pathology of malignant hypertension. The effects of severe high blood pressure on the eye were investigated by Dollery, who had elaborated a technique for photographing the retinal circulation after injection of fluorescein; the lesions in hypertensive retinopathy were probed with Norman Ashton and D.W. Hill. From this clinic also emanated the work of M.D. Milne on the fundamental distribution of drugs in body fluids, and that of C.L. Cope on hyperaldosteronism.

McMichael himself became involved in the public debate over the genetics of hypertension in which he sided with Platt against Pickering. His interest in arterial disease at this time also caused him to enter the controversy about the efficacy of anticoagulants in coronary artery thrombosis. He pointed out the flaws in the non-randomized anticoagulant trials, and the dangers of this form of therapy; and he saw no reason for long-term anticoagulant prophylaxis after coronary occlusion. His strongly expressed views were in the main accepted, and obscured for some years the recognition that there was a benefit, albeit much smaller than originally thought.

**Head of Department**

Once established, McMichael became an ever more formidable figure as the years went by and his reputation grew both nationally and internationally. There was never any doubt as to whose hand, however kindly, was on the tiller. Like his predecessor, he was a good talent spotter; and once in post and of proven commitment his staff received every support. He made a point of keeping in touch with all the projects in progress in the department, and he gave a freedom to pursue them, although (in the words of Charles Newman) this was never allowed to degenerate into licence. The atmosphere he created in the department was one of free discussion, irrespective of rank. When action was required he could be ruthless. He had a great faith in his own judgement, and a strong sense of purpose, as was so aptly demonstrated by his determination to pursue, in the face of opposition from medical colleagues...
elsewhere, techniques such as cardiac catheterization and liver biopsy.

He was also a man of strongly held opinions, and these had implications for his department. He was highly sceptical about the value of the emerging science of epidemiology, and gave only a very limited backing to it throughout his tenure. He also remained of the opinion that physicians should be responsible for all aspects of research on their patients—a view which was perhaps understandable in relation to the pathophysiology of the heart and lungs, but one which was becoming no longer tenable in other fields which would have benefited from firmer support in basic scientific disciplines such as biochemistry.

In his role as physician, he had an exemplary attitude towards his patients, with his kindly approach to them and their relatives. Although an affable figure, and always approachable in such time as his many commitments allowed, he nevertheless did not encourage familiarity. There can be few who left the department without feelings of gratitude for professional advice and personal kindnesses.

**THE BRITISH POSTGRADUATE MEDICAL FEDERATION (1966–71)**

John McMichael caused some surprise when he announced in 1966 that he had decided to leave Hammersmith and to succeed Sir James Paterson Ross as Director of the British Postgraduate Medical Federation (BPMF). In explanation he said that he thought he could now leave further developments at Hammersmith, which included plans for new buildings, to his successor; and that with a later retiring age the BPMF post would give him time and scope for developing postgraduate medical education on a national scale.

The role of the BPMF had developed somewhat since it was established after the war by Sir Francis Fraser, when emphasis had been placed on providing much-needed training and re-training facilities for doctors not only from the U.K. but also from overseas, especially the Commonwealth countries. Regionalization of the U.K. for educational activities, with each region under the immediate supervision of a University Medical School, had been followed by a pilot initiative by D. Bowie of the BPMF to set up postgraduate teaching centres with tutors in large peripheral hospitals; and this was endorsed as national policy in 1964 at a meeting called by Pickering and sponsored by the Nuffield Provincial Hospitals Trust. McMichael strongly supported this development—encouraging, opening and visiting many of these new centres, which by 1970 numbered over 300 in England and Wales. (Scotland seceded from the BPMF, and assumed responsibility for its postgraduate medical training facilities.) In London the postgraduate institutes caused McMichael some concern and frustration. Each institute had its own Dean and Governing Body, and he, at heart very much a director, had to settle for direction at one remove. He did his best to defend the institutes and their specialist hospitals which were, even then, coming under attack for scientific isolation. Moreover there was general apprehension about what recommendations would be made by the Royal Commission on Medical Education under the chairmanship of Lord Todd, and forward planning was thereby impeded. When the Todd Report became available and the long-term implications were known, McMichael felt that these should be dealt with by his successor, and he left the BPMF in 1971. He left without regret, and his private papers show that he had found it hard to adapt to an administrative role which removed him from direct contact with the young clinical investigators with whom he identified. He had worn the cloak of the physician–politician uneasily, and was glad to be able to devote more of his energies to the affairs of the Wellcome Trust.
The Wellcome Trust

At the time John McMichael became a Trustee of the Wellcome Trust in 1960, sponsored by Sir Henry Dale for whom he had a profound and long-standing admiration; it was a much smaller organization than it is today. The Trustees were almost all elderly, the youngest apart from McMichael being Sir John Boyd who was 69 years old. The annual income was about £1 000 000 and most of this was spent on laboratory buildings. The Wellcome Trust gave McMichael fulfillment and kept him in touch with science; and he in return revolutionized the Wellcome’s approach to its mission. In Dr Peter Williams's words, through his personal knowledge of clinical science ‘he taught the Trust how to spend’. McMichael gave the Trust a sense of identity which was independent of the MRC and almost singlehandedly persuaded it to undertake a number of important developments. The Wellcome Senior Clinical Fellowship scheme was entirely his idea and, apart from the MRC training fellowships it is difficult to think of any other initiative which has had a greater impact upon recruitment into clinical science in Britain. A remarkably high proportion of the most talented young clinical investigators in the U.K. have progressed from clinical registrar appointments to MRC training fellowships and, at senior registrar level, have obtained a Wellcome Senior Clinical Fellowship. The five years in the fellowship gave them the chance to establish their own research programme and show their mettle. He also proposed the Swedish exchange fellowships which brought U.K. scientists into contact with the outstanding scientific work, particularly in physiology, which was being undertaken in Sweden. He persuaded the Trust to support research projects and people rather than buildings.

By the time McMichael ceased to be a Trustee, in 1977, the Wellcome Trust had grown up into a major and expert source of grant support for biomedical research.

McMichael and the MRC

John McMichael was a member of the MRC from 1949 to 1953. Those post-war years in which the National Health Service was being introduced were ones of great importance for the development of clinical science in the U.K. McMichael himself was a member of the Cohen Committee set up jointly by the Standing Medical Advisory Committee of the Ministry of Health and the MRC to make vital recommendations on ‘what arrangements should be made for the further encouragement and development of clinical research in relation to the NHS’. McMichael had already created at Hammersmith the dominant clinical research centre in the U.K. The new Secretary of the MRC, Sir Harold Himsworth, was impressed by the National Institutes of Health (NIH) in Bethesda, U.S.A., and was already toying with the idea of building something similar in Britain. He saw the need for a facility for multi-disciplinary research involving clinical research investigators and basic scientists on a scale not possible in the existing MRC clinical units, which were generally embedded, and sometimes constrained, within University teaching hospitals. The eventual result, agreed by the MRC in the early 1960s, was the building at Harrow of the Clinical Research Centre (CRC) in conjunction with Northwick Park Hospital, a new district general hospital. McMichael was critical of the scheme on several grounds – including the isolation of the Centre from the University ambience, the lack of designated specialties in a district general hospital, the difficulties inherent in having on the one site two populations of staff with different aims and responsibilities, and their divorce from teaching, etc. – and he did not hesitate to
say so. Now, with the impending closure of the CRC and the relocation of a large component of its staff to Hammersmith it is possible to see that both McMichael and Himsworth were partly right. Clinical research, even as at CRC where the stated emphasis was on research on common diseases in a district hospital setting, was bound to be disadvantaged by the absence of referral services in such areas as cardiology, nephrology, oncology, etc. Close integration of clinical and academic work as based on the US Chief of Staff model was a powerful asset at Hammersmith, while at Northwick Park an initially close contact between hospital and CRC tended to come adrift. On these points McMichael was right. But Himsworth saw more clearly the need to develop laboratory science as a foundation for clinical research, on the NIH model. He was less attached to human physiology than McMichael, and foresaw the increasing importance of subjects such as biochemistry and genetics. If these two formidable clinical scientists had seen more clearly the force of each other’s arguments in the years 1952–56 which led up to the establishment of the CRC, Britain might have acquired an institution certainly as effective, if perhaps smaller, than the NIH.

**The British Heart Foundation**

McMichael was much involved in the setting up of the British Heart Foundation. He had long been concerned that the money available in Great Britain for research on the heart and circulation was very limited, and that the MRC devoted only a small part of its budget to an area which caused about 50% of the country’s deaths. From 1962 he served as Vice-Chairman of the Science Committee and was active in appeals for funds to establish a firm financial base; and he was Chairman of Council from 1968–73. He was delighted when in 1976 the Foundation established at the Royal Postgraduate Medical School an endowed chair, to be called the Sir John McMichael Chair in Cardiovascular Medicine.

**The Later Years**

John McMichael had no real interests apart from his work. After retirement from the BPMF he re-orientated his studies towards the history of medicine, which he found fascinating when preparing his Harveian Oration to the Royal College of Physicians (1975) on the Mackenzie–Lewis era: from his small room in the Wellcome Institute, with all the facilities of the Wellcome Library at his disposal, he delved into the history of atrial fibrillation from the early 17th century onwards. He also entered the public controversy about the role of dietary fat as a causative factor in atheroma and coronary heart disease. Having studied the reports of the numerous clinical trials which were continuing to emerge, he concluded that the evidence was not sufficient to warrant the campaign currently being mounted to change the nation’s dietary habits. He wrote trenchant letters on the subject to the medical press and spoke frequently against the protagonists.

In 1971 McMichael took on the chairmanship of the Editorial Advisory Board of *Medicine*, a new illustrated textbook of medicine written by expert clinicians and scientists, circulated in monthly sections, and revised every three years. He edited one series himself, delighted to be personally updating his medical knowledge, and dragooning his contributors into elucidating their jargon and correcting their English. In 1977 he left the shop floor to become Honorary Vice-President.
In his leisure time he was to be seen pottering around Hampstead Garden Suburb on a small motor bike, tending an allotment, and giving rather unskilled help to his wife in the garden. Then in 1982 disaster struck. While on holiday at his small house in Galloway he suffered a severe but non-fatal stroke, which left him with some paralysis, a speech defect and an inability to read. After intensive efforts at rehabilitation he improved for a time. But he found his restricted life frustrating, especially the inability to express himself coherently when in the company of family and friends. With further cerebral episodes and intercurrent illness he deteriorated over the years, during which he was nursed with great devotion by his wife. As someone who had contributed so much to the understanding of cardiovascular disease, he retained insight into his prognosis, resenting the prolonged duration of his illness and looking forward to his release.

FAMILY LIFE

John McMichael married three times and had four children. His first wife, Joan, was a fellow medical graduate from Edinburgh and they had two sons, Ian and Hugh. Joan became very active in left-wing politics, and with conflicting interests the marriage foundered and was dissolved while the two boys were in Canada as wartime evacuees. In later years McMichael never spoke about his first marriage. McMichael’s second wife, Sybil, had formerly been a radiographer, and she also had two sons, Andrew and Peter. A sincere and serene personality, she successfully integrated the returned emigres into the new family. In times when clinical academics were not well paid, money was tight in a household with four children at school. McMichael was entirely devoted to his work, and a somewhat forbidding figure to his offspring. Holidays en famille were rare, the boys often spending vacations in Scotland with their aunts. After his second wife’s death, McMichael married Sheila Howarth, an earlier co-worker and widow of his former colleague, Peter Sharpey-Schafer. She survives him. Two sons, Hugh and Andrew, followed their father into the medical profession; Ian became a solicitor and Peter an engineer.

EPITAPH

John McMichael was a great man who never forgot his humble origins in lowland Scotland, for which he retained a lifelong affection. He became one of the outstanding clinical scientists of his generation, and was recognized as such wherever investigative medicine flourished. On the scientific front he will be best remembered for his work on heart failure, especially in relation to his elucidation of the mode of action of the cardiac glycosides. But perhaps his greatest contributions to British medicine were his creation of the Department of Medicine at Hammersmith, where clinical research workers from all over the world received their initial training and in setting on course the research activities of the Wellcome Trust. In each of these he devoted himself to facilitating the careers of bright young scientists. Very many people owe their career opportunities to him. Unlike so many others who make it to the top, he felt it was his duty to make it easier for others to join him there, not to cut off the pursuit. Fearless leadership of the kind he demonstrated is much needed in these times of trouble for academic medicine.
HONOURS, ACADEMIC DISTINCTIONS AND AWARDS

Knighted 1965
Hon. F.A.C.P. 1959
Hon. LL. D. Edinburgh 1961
Hon. M.D. Melbourne 1965
Hon. D.Sc. Newcastle 1965
Hon. D.Sc. Sheffield 1965
Hon. D.Sc. Birmingham 1966
Hon. Sc.D. Dublin 1967
Hon. D.Sc. Ohio 1970
Hon. D.Sc. Wales 1978
Hon. F.R.C.P. Ed. 1981

Honorary member of the American Medical Association, 1947
Honorary member of the Medical Society, Copenhagen, 1953
Honorary member of the Norwegian Medical Society, 1954
Honorary member of the Association of American Physicians, 1959
Foreign member of the Finnish Academy of Science and Letters, 1963
Foreign correspondent of the Academie Royale de Médecine, Belgique, 1971
Fellow of the Royal Postgraduate Medical School, 1972
Foreign associate of the National Academy of Sciences, Washington, 1974

Thayer Lecturer of the Johns Hopkins Hospital, 1948
Oliver—Sharpey Lecturer of the Royal College of Practitioners, London, 1952
Watson Smith Lecturer of the Royal College of Practitioners, Edinburgh, 1958

Sir Arthur Sims Commonwealth Travelling Professor (Australia & New Zealand) 1960
Croonian Lecturer of the Royal College of Practitioners, London, 1961
Morgan Professor, Nashville Tennessee, 1964
Harveian Orator of the Royal College of Practitioners, London, 1975

Cullen Prize of the Royal College of Practitioners, Edinburgh, 1953
Jacobs Award, Dallas, 1958
Moxon Medal, Royal College of Practitioners, London, 1960
Gairdner Award, Toronto, 1960
Wihuri International Prize, Finland, 1968
Krug Award for Excellence, 1980

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I am extremely grateful to Lady McMichael who gave me a great deal of assistance with the preparation of this memoir. Professor J.P. Shillingford, Dr Peter Williams and Mr Arthur Latham also made contributions which illuminated different aspects of John McMichael’s work.

The photograph was taken in 1965 at his desk in Hammersmith after the announcement of his knighthood. It was taken by the Acton Gazette & West London Post.
REFERENCES TO OTHER AUTHORS


BIBLIOGRAPHY

The complete bibliography appears on the accompanying microfiche. A photocopy is available from the Royal Society Library at cost.