

BIOGRAPHICAL MEMOIRS

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Dame Sheila Patricia Violet Beckett Sherlock was the world's leading female physician-scientist of the twentieth century. Her brilliant, wide-ranging, original contributions to the investigation, diagnosis, classification, epidemiology, pathogenesis and management of liver disease played a leading role in the establishment of hepatology as a medical specialty. Her rigorous, highly focused, studies combined experimental and laboratory investigations with meticulous clinical observation, encompassed most aspects of liver function, disease and treatment, and led directly to enormous benefit for millions of patients. Her remarkable individual personality also had a profound influence not only on her medical and scientific specialty but also on several generations of physicians throughout the world. She was the first female professor of medicine and head of a department of medicine in the UK, and the pioneer of women in modern medicine. The importance of her contributions to knowledge and her massive influence on training in and the practice of medicine related to liver disease were recognized by a glittering array of honours and awards from professional societies and academic institutions throughout the world, including 19 honorary degrees, and, very belatedly, election to Fellowship of The Royal Society in the last year of her life.

CHILDHOOD

Sheila was born in Dublin just before midnight on 31 March 1918, the obstetrician Mr Tierney conducting an uneventful delivery. Her father was then a Captain in the Royal Green Jackets on a peace-keeping assignment in an era when officers were allowed to have their wives with them in comfort. However, the family soon moved back to London and lived just behind

Marble Arch, a location chosen for its proximity to Hyde Park for their pet dogs. Sheila remained attached to dogs throughout her life. Sheila attended private schools in this area of central London and in Swiss Cottage until she was aged 7 or 8 years, when they moved to Devonshire Terrace, Sandgate, Kent. A Harley Street chest specialist had decided that her childhood coughs and colds were due to London soot and fog, and recommended a seaside home. The Kent coast was chosen because her grandfather, Colonel Beckett, lived nearby at Chilham. Sheila thrived in Kent and had an uneventful schooling at Folkestone County School for Girls, enjoying tennis and hockey, following cricket, and responding to the affectionate attention of schoolmistress Miss Ames.

EDINBURGH MEDICAL STUDENT YEARS

Sheila Sherlock entered Edinburgh University Medical School in 1936 and qualified in 1941. Her medical student days included some seminal influences both on her intellectual development and on her subsequent professional career. This period is vividly captured in her autobiographical memoir of the period that was published in 1978 (17)*, extracts from which follow.

I spent six happy years in (Edinburgh) medical school and look back with affection and with pride to my time there.

My journey from London to Edinburgh was by road in a coach without the benefit of the M1. It was October 1st, 1936, and I was arriving in Edinburgh to start my medical training at the University. My adrenalin was turned on both from excitement and travel sickness as I climbed the Mound to spend my first night in a Church of Scotland women's hostel. I had only been accepted for medical training on the 15th of August. The past year had been a series of frustrations and interviews for admittance to medical school. I had been rejected everywhere. I had even studied St Mark's Gospel in order to take a theology entrance examination at King's College, London, but was unsuccessful. It was even more difficult for women to enter medicine then than it is now. I shall never know what factor determined my late acceptance at Edinburgh University. Certainly, I could pull no strings. This late acceptance has coloured my feelings towards Edinburgh, both then and now, and accounts for the rather rosy glasses with which I have, in later life, viewed the training received and the personalities I encountered.

Jimmy (Poppa) Learmonth, the Professor of Surgery, was my favourite teacher. A highly intelligent man, he exemplified the best of Scottish academics. Neat, tidy, quick-tempered and with a biting tongue, he frightened some students, but others adored him. I idolized him. The juniors selected for his support always regarded him as 'Poppa', and he behaved as such. When I was engaged to be married, he came down on the night train from Edinburgh, inspected my fiancé over breakfast at King's Cross Hotel, and then returned home. When my first-born arrived he was quickly on the scene, presenting me with a grouse's foot for good luck. We remained friends until he died in 1967.

I (too) had to work during the summer holidays. In the long vacation of the pre-clinical years, I returned to Folkestone, and worked as a waitress in the local Tatler tea-rooms. It must have been a horrific performance. I also worked part-time as a tutor in Basil Paterson's cramming school in Palmerston Road. I taught physics, chemistry, and mathematics to candidates for the Scottish highers and for university entrance. This was useful training for my later career as a university teacher.

The Edinburgh Union adjoins the new quadrangle where medical teaching takes place, and abuts the MacEwen Hall. It served as a social centre in a non-residential University and was a substitute for Oxford and Cambridge colleges. And like most of them, it did not recognize women. An exception was made on Saturday nights, when it became a fun dance-hall Palais, so they had to have women. We danced the Veleta, the Gay Gordons, the Dashing White Sergeant, and I wore a long blue taffeta gown. The gay bucks of the Union leant

* Numbers in this form refer to the bibliography at the end of the text.

against the walls drinking beer and lamenting the lack of talent. Afterwards, we went to the foot of the Mound, where a coffee-stall sold bacon rolls—a real treat in the days of wartime rationing.

The Women's Union, on the other hand, was rather prissy and jolly hockeysticks. I did not join, for the same reason that I have never joined the Medical Women's Federation. Women in medicine, and indeed in any other profession, must advance on merit and not because they are fighting as an under-privileged minority. If a woman is intelligent and is determined to apply herself then she can reach the top nowadays without the help of women's organizations. What is more important is to choose a sympathetic, understanding husband.

The Cosmopolitan Club was my favourite club. It was held on Sunday evenings, always a dead time in Edinburgh. It took place in the home of Dr G.B. Ludlam, a Senior Lecturer in Zoology and a Quaker. The Ludlam family allowed their home to be invaded every Sunday by upwards of a hundred students from all over the world to hear subjects of general interest. I well recall Stephen Spender reading his poems.

I had little money to spare in my student days. My mother and I lived on a £60 per annum grant from the Kent Education Committee (£30 of this was a loan!). My old school, Folkestone County School, gave me a scholarship of £120 per year. With the money raised from vacation jobs, this had to cover living, books, tuition and examination fees. I recently came across an old account book showing how the money went. Many books had to be bought at that time and these were usually obtained second-hand. The matriculation fee to the University was compulsory and allowed participation in most student activities. A hospital ticket permitting practice in the wards of the Royal Infirmary *in perpetuo* cost £18. My old account book contains other interesting items such as Year Dinner—two shillings; tennis team photo—three shillings and sixpence; golf clubs—four shillings; broken slide—one shilling. A hilarious obstetric course, spent at the National Hospital, Dublin, cost £16 (the fare being only £2.14s, and the subsistence for two weeks £5.16s).

Finally, on July 6th, 1941, we all graduated. The morning started with a visit, clad in hired academic robes, to the photographers. (My portrait shows me looking slightly self-satisfied.) D.K. Henderson gave the address. He took his text from John Buchan, 'Patience shuffle the cards'. As an impetuous Aries-born, I often think of it. Over the years, this text has stood me in good stead. In the evening we had a ball in the New Cavendish Dance Hall. I can remember little of it.

In a couple of days, I was off to Perth to do a *locum tenens* in general practice—pre-registration House Physician and House Surgeon appointments were not compulsory then, before one was set loose on the world. I was substituting for Dr Grace McRorey, who was going on holiday. She had a very general practice. I rode around Perth on a bicycle, visiting the patients, and in her office, collected half-crowns from those who could afford to pay them. Wives and children were not eligible for free medical care. Two weeks were enough to convince me that the rest of my life was not going to be spent in general practice.

My mother, who had nourished me throughout my training, was delighted when I landed the Ettles Scholarship, awarded to the first of the year. I was the second woman in the history of the Medical School to receive this award, so they did not have much experience of coping with feminist problems. The Ettles Scholarship would normally open the doors wide to plum House appointments at the Royal Infirmary, but not for a woman at that time. The Residency was a sacred male precinct, but perhaps they had no toilet facilities for women. Poppa Learmonth overcame the impasse by appointing me to an academic post as an Assistant Lecturer in Surgery. I was virtually a House Surgeon assisting at operations, but even at that stage, I had an opportunity of becoming interested in medical research. Poppa taught me how to organize results, how to write a paper, how to review the scientific literature. This I have passed on from perfectionist Poppa to my junior colleagues over the years. At the end of the year, Poppa begged me to give up surgery. I had snipped too many pairs of his operating gloves. But he paved my way to an academic future by arranging for my transfer to Hammersmith Hospital to work under another Ettles scholar, the great Sir John McMichael, FRS.

I went to Edinburgh in 1936, an impecunious Kent County student. In the subsequent five years that I was a student there, the University gave me a bitterly cold climate, warm friendship, a place in the Edinburgh University Tennis Team, outstanding teaching, and a road to a future in academic medicine. These are rewards enough for any young girl.

PROFESSIONAL CAREER

After her brief experience in surgery with Learmonth in Edinburgh, Sheila became House Physician to Dr (later Sir) John McMichael (FRS 1957) at what was then the Postgraduate Medical School at Hammersmith Hospital in London. This remarkable institution, which subsequently became the Royal Postgraduate Medical School, sadly no longer exists as an independent institution since its merger into Imperial College in 1998. However, for nearly 60 years it was the premier academic medical institution in the UK. The great majority of leading academic physicians passed through the RPMS during their training on their way to senior positions in universities and medical schools in Britain and many other parts of the world. Initially rising to this pre-eminence during the 1930s and 1940s under the astute leadership of McMichael and other heads of departments there, the senior staff of the Hammersmith remained among the most eminent clinical scientists in each of their specialities for the next several decades. Coupled with the ethos, unique in the UK, of an almost wholly academically led and research-oriented teaching hospital catering only for postgraduate students, this made the Hammersmith an obligatory destination for all aspiring academic physicians. Sheila was one of the early stars whose brilliance contributed greatly to the reputation and lustre of the institution. Unsurprisingly the activities and achievements of Sheila and colleagues, particularly their invasive investigational techniques including cardiac catheterization and liver biopsy, were not admired by some in the traditional medical schools of the time, some of the medical establishment dominated by private practice, and a few other colleagues who largely disdained scientific and academic medicine. The immense benefits for knowledge, and most importantly the wellbeing and survival of patients, soon comprehensively vindicated Sheila and the Hammersmith approach.

Sheila remained at Hammersmith for 17 years, apart from one year spent in the USA, until her appointment in 1959 at the Royal Free Hospital School of Medicine as the first woman professor of medicine and head of a department of medicine in the UK. She was already an acknowledged world leader in her field, having been a founder of the International Association for Study of the Liver in 1958. The other founders chose her as their first President, not only, so they said, because of her eminence but because she was pregnant at the time and thus the only one of the group with two livers! Her new department was initially located in extremely limited and primitive 'temporary' accommodation on the roof of the Royal Free Hospital in Gray's Inn Road, London, W.C.1, but was eventually moved into spacious modern facilities in the newly built Royal Free Hospital in Hampstead, London, N.W.3, in 1975. Between 1959 and 1983 Sheila's department, known as the Medical Unit, rapidly became and then remained the leading centre in the world for research into and the clinical investigation of liver disease. In addition to her pervasive influence on the development of hepatology internationally, Sheila was a dominant and entirely constructive influence at the Royal Free, both in the Medical School and the hospital, impacting on everything from the medical students, including their sporting activities, up to appointments of senior medical staff. Having been the youngest woman elected to Fellowship of the Royal College of Physicians, aged just 33 in 1951, she became the first woman to be Senior Censor and then Vice President of the College, and in 1983 she narrowly missed being elected as the first woman President. After retirement from her chair in 1983, Sheila transferred her office to the Department of Surgery at the Royal Free and continued, with unabated intensity, her clinical practice and arduous schedule of lecturing and academic activity all over the world. She remained as alert and well-informed as ever until

the end, speaking in her typical concise, well-organized, and thoroughly to the point fashion both in her New Fellows seminar at The Royal Society and at the party held in July 2001 at the Royal Free to celebrate her election.

The formal milestones of her career and the outstanding achievements and recognition that she received are summarized at the end of the memoir.

SCIENTIFIC ACHIEVEMENTS

Sheila Sherlock's first scientific work was her seminal study of jaundice in wartime, using percutaneous liver biopsy, in which she showed that the underlying pathology was hepatitis, rather than any form of physical obstruction to bile flow, as had been believed until then (1). Her subsequent pivotal work established liver biopsy as an essential routine tool for the diagnosis both of liver disease and of extra-hepatic diseases that may involve the liver. Her correlation of liver biopsy histology with serum concentrations of liver enzymes (2) is the basis for use of so-called liver function tests in research and clinical practice, and the modern classification of liver disease.

Sherlock was also the first to apply newly developed techniques of vascular catheterization to the investigation of liver disease. She characterized for the first time the neurological syndromes associated with liver failure, elucidating the pathological anatomy, pathophysiology and underlying metabolic abnormalities in portal-systemic encephalopathy, a term she coined (3). She showed that cirrhosis obstructs blood flow through the liver, increasing portal venous pressure, leading to the diversion of blood into the systemic circulation through collateral veins or within the damaged liver. Ammonia and other products of ingested protein thus reach the brain causing neurological dysfunction (4). These discoveries were the basis for critical medical and surgical interventions, many of which were pioneered by Sherlock, and are still used to manage such patients (5). She also demonstrated that extra-corporeal support provided by perfusion through pig liver could keep patients with otherwise terminal hepatic coma alive long enough for liver regeneration to occur (11). Although most such patients can now ideally be treated by liver transplantation, the shortage of donor organs is currently reawakening interest in short-term extra-corporeal hepatic support for which Sherlock first achieved the proof of principle. She also characterized the circulatory disturbances associated with liver disease (6, 16) and the underlying abnormalities of renal and intra-renal blood flow that are responsible for the hepato-renal syndrome, in which renal failure complicates advanced liver failure in the absence of renal structural changes (12, 20).

The value of immunological tests in differential diagnosis of obstructive jaundice was much enhanced by Sherlock's demonstration, in collaboration with Deborah Doniach, of anti-mitochondrial antibodies in the sera of patients with primary biliary cirrhosis (7, 8). Before the modern era of non-invasive imaging this provided a critical distinction from major bile duct obstruction requiring surgical intervention. She also characterized the autoantibody profiles of other inflammatory liver diseases (8), enabling diagnostic differentiation and guiding appropriate anti-inflammatory therapy, and Sherlock was the first to show that steroid treatment was effective in autoimmune hepatitis (10).

After Blumberg's identification of the hepatitis B antigen, Sherlock contributed importantly to the elucidation of the immunopathology (13, 14) and epidemiology of this infection. She was the first to establish the association between chronic hepatitis B infection and primary liver cell cancer (9), and in a typically careful clinicopathological study involving visits to

patients in their homes, she first identified the spread of hepatitis B via semen among male homosexuals in London (15).

Among wide-ranging studies of the mechanisms responsible for virtually all forms of cholestasis and jaundice (see, for example, (19)), Sherlock's leading work on drug-induced jaundice, including that caused by anaesthetic agents, elucidated a previously confused field and had major clinical consequences (18).

In addition to her many original scientific and clinical publications, the unique breadth of Sherlock's contributions to hepatology and the depth of their impact on physiological and pathophysiological knowledge, and crucially on clinical practice worldwide, are illuminated by her book *Diseases of the liver and biliary system* (21). First published in 1955 and a single-author text until 1993, the 11th edition was published in 2001, and it has been translated into Chinese, German, Greek, Italian, Japanese, Portuguese, Spanish and Turkish.

A UNIQUE PERSONALITY IN MEDICINE

All who taught Sheila, were trained by her, or worked with her in any way clearly enjoyed an absolutely unique experience, derived from both her intellectual, professional, scientific and medical excellence and her wonderful personal qualities. Two Festschrift meetings, in 1978 for her 60th birthday and in 1983 for her retirement, and a compilation of her published papers at that time, provided opportunities for some of the most eminent of her teachers, her students and her colleagues to record their personal appreciations. These document Sheila's achievements but especially her remarkable talents and qualities more appropriately than any possible third-party account, and with vividness born of close personal acquaintance and affection.

Sir John McMichael FRS wrote (McMichael 1978):

Sheila Sherlock received her medical education in Edinburgh, where her student career was brilliant. She qualified in 1942 and had had to work extremely hard coaching other students to pay her way through the course. In addition to this tremendous effort, she helped to sustain her mother whose income was frugal. Her brilliance was combined with singular personal charm and, surrounded by many friends, she came to the notice of that exacting task-master Professor James Learmonth. She finished her undergraduate career as the most brilliant student and Ettles Scholar of the year 1942. On the recommendation of Professor Harold Scarborough she visited Hammersmith Hospital when I was in charge of the Medical Unit and expressed an interest in coming to work there. In due course we had to take up her references and I remember well the decisive letter from James Learmonth who was a fellow Scottish village schoolmate: 'Dear Jack, if you get Sheila Sherlock as your house physician you will be darned lucky'.

It was wartime and she quickly showed her capacity not merely to be a first-class doctor but also to have a tremendous dynamic urge towards research. 'Catarrhal jaundice' was an enormous problem among the troops, especially in North Africa, and also post-transfusion jaundice was beginning to be recognised. The nature of the condition had been largely guess-work and I had already embarked on liver biopsy to understand more clearly the nature of the problem.

Thus began Sheila's interest and development of her skill in the analysis of liver disease. She returned to Edinburgh in 1944 but within a year she had been awarded a Beit research fellowship, holding which she returned to work at Hammersmith. She extended her technical skills in analysing liver disorders by using the bromosulphophthalein method of estimating hepatic blood flow by catheter sampling from the hepatic vein. This added a new dimension to her researches and very quickly she was recognised as a future leader of great potential. She was awarded a Rockefeller travelling fellowship in 1947 and spent a year in Yale where she established many contacts with other leaders in liver studies. She contributed substantially to the interchanges between the United States medical schools and Hammersmith, which developed strongly following this period.

When the second world war ended we were inundated with large numbers of mature British trainees who had seen strenuous military service but also many who would be returning to other countries, particularly South Africa, Australia and New Zealand, and Canada. We appointed Sheila as a lecturer in medicine and consultant physician, giving her full charge of a medical ward. She was then aged 28 and our confidence was fully justified by her growing renown and her gifts as a teacher who could hold the interest of many postgraduates senior to herself in age. Her dynamic energy never flagged and in the intervening three decades her reputation and leadership have never been challenged.

She has had many firsts. She was the youngest woman physician to be elected to the Fellowship of the Royal College of Physicians. In her Edinburgh days women were not admitted to the two centuries-old Royal Medical Society. Sheila was the first to break into this male preserve when invited to lecture there to a crowded house. A whole string of awards came her way from all the specialist associations dealing with liver disorders and, indeed, with gastroenterology. She remained an academic physician in the department of medicine at Hammersmith for 11 years from 1948 to 1959, after which she was appointed professor of medicine at the Royal Free Hospital. During her period at Hammersmith the accommodation in the department of medicine was extremely cramped, affecting all our staff. There were restrictions on the numbers who could be promoted into higher academic ranks and Sheila's laboratory was invariably crowded even beyond its maximum capacity. She was well trained therefore in 'making do' with inadequate space and, while holding the chair at the Royal Free Hospital on its now abandoned old site, she had to establish her own laboratory in a hut on the roof approached by a variety of step-ladders! 'Nil desperandum', she achieved a continuation of her development with a well-selected core of staff and a multitude of brilliant young visiting researchers who came to work with her. Most of these are now moving on into senior positions in teaching hospitals and to chairs of medicine in the English-speaking world. It was deplorable that the Royal Free and many other leading academic medical units were housed in totally inadequate quarters, but all now rejoice that, at least, the Royal Free Hospital has been relocated and rebuilt. Thus in the last year or two Sheila has found herself at last with space, accommodation, and equipment in harmony with her position as a leader of British and, indeed, European medicine. High positions have come her way, Presidencies of international societies, Senior Censor and Vice-President of the Royal College of Physicians, honorary fellowships of the American College of Physicians and of the Royal Canadian College of Physicians, together with many other recognitions.

Sheila commutes across the Atlantic to maintain her international contacts, which carry many responsibilities. Her relationships with and acquaintance with the leaders of world medicine have been enormously beneficial to this country.

She has combined her successful career in academic medicine with a happy domestic life as a wife and mother. Her husband, D. Geraint James, is an active consultant physician and an enthusiastic teacher and organiser of medical societies. Strongly extroverted, he maintains a wide range of contacts extending beyond the academic circle. Together they have brought up two daughters and they run a most hospitable household where overseas visitors are so frequently welcomed and entertained.

Sheila's personality is one of enjoyment of life. She enjoys her work, she enjoys teaching, she enjoys tackling clinical problems. She rises to every occasion and fits the posts offered to her so frequently with meritorious accomplishment.

She has published hundreds of papers on every facet and consequence of liver disease, including cerebral and renal complications and the associated metabolic disorders, immunological and viral factors. Generous and loyal to her associates, she remains her charming modest self and is perhaps the most outstanding and exemplary leader in British university medicine today.

Dr Alexander Bearn, Member of the US National Academy of Sciences, wrote (Bearn 1983):

Because of Sheila's outstanding student career, Professor James Learmonth (later Sir James) asked her to become his house-surgeon. Although Sheila ascribes her later shift from surgery to medicine to a lack of manual dexterity, it seems more probable that she was attracted to medicine for its wide intellectual scope and for its opportunities for scientific research.

The opportunity to return South ('I can't stand the cold') and to become house-physician to Professor John McMichael (an earlier Ettles scholar) at the Postgraduate Medical School in London was irresistible. From

then on, in the uniquely productive environment of the School which John McMichael had done so much to create and develop, Sheila went from strength to strength.

The Postgraduate Medical School in the forties and fifties was a very special place. The laboratories in the medical corridor were a far cry from today's spacious, elegant and gleaming facilities. But like the Medical Research Laboratories at Cambridge, they were alive with the restless enthusiasm of young research workers eager to know more about human disease. Working with John McMichael and the great pathologist, Professor John H. Dible, Sheila tackled the age-old problem of 'catarrhal jaundice', using the newly-introduced technique of liver biopsy. The technique was regarded as dangerous by many of the more conservative clinicians of the day. But, in the safe and determined hands of Sheila, it enabled her, with the unwavering support of John McMichael, to establish rapidly the true nature of the disease by successfully combining and integrating the clinical, biochemical and histological findings.

By this time Sheila was well launched on a research career of increasing scientific excellence and sophistication, directed always towards a better understanding of clinical disease. In 1947, armed with a Rockefeller travelling fellowship, Sheila went to Yale where she immersed herself in modern biochemistry in the Department of Physiological Chemistry under the leadership of C.N.H. Long. Her year in New Haven deepened her knowledge of biochemistry: equally important, she met and came to know as personal friends the leading experts in liver disease throughout the United States.

Upon her return to England, John McMichael promptly appointed her Lecturer in Medicine at the Postgraduate Medical School and Honorary Consultant in Medicine at Hammersmith Hospital. She was thirty years old.

Inigorated and inspired by her overseas sabbatical and with indefatigable drive, aggressive enthusiasm, and an undeniable panache, Sheila began to build a reputation that extended well beyond Ducane Road. In addition to her research, presented regularly at meetings of the Medical Research Society and published in journals such as *Clinical Science* and the *Journal of the Physiological Society*, she published her more clinically oriented studies in the *Lancet* and the *British Medical Journal*. The latter two, in particular, attracted the attention of general physicians as well as gastroenterologists. Despite her youth and sometimes formidable manner, she soon became a referral centre for the puzzling and the obscure. Sheila has a well-developed clinical nose, as well as a critical understanding of the value and limitation of ancillary biochemical tests. These powerful intellectual attributes, however, are all subservient to a robust common sense which leads her very directly to the correct diagnosis.

It was in 1949 that I became Sheila's registrar and, for two years, I had the most enjoyable of times. Under a somewhat tart manner, Sheila has a sensitive heart and an exceptionally loyal nature. Chivvied and harangued, encouraged and forgiven, all who worked for her became better than we really were. Arrogance and bombast were not appreciated, but sincere interest and a genuine desire to work were richly rewarded. If we learned anything, it was that research was fun—serious, of course, but above all fun. Research was an exciting adventure and when success was achieved, even in a small way, it was celebrated with boisterous abandon at the Blue Anchor.

In 1950, Sheila was asked to arrange a Ciba symposium—one of the very first—on liver disease, one of the most memorable gatherings I have ever attended. It was typical of Sheila's concern for 'her boys' that we were somehow smuggled in to hear the leading liver specialists (hepatology was not in favour as a word in those days). Typical too that she saw too that we not only heard these doyens of hepatology but drank sherry with them at the close of the day. Sheila's meteoric rise to international renown has occurred so rapidly that at the time of the Ciba meeting where she was much fêted, she had not yet been elected to the Fellowship of the Royal College of Physicians. In 1951 I was despatched to the United States for one year for additional research training with Henry Kunkel, to whom I had been introduced by Sheila at the Ciba meeting. I went to the United States heavily laden with introductions and with sharp instructions to be sure and look up her many friends in liver disease.

To have worked with Sheila was enough to gain admittance to the most inaccessible of Professors. I was also greatly and undeservedly helped by the tradition, then prevailing in Sheila's lab, that authors of papers were to be listed alphabetically!

For the next eight years Sheila's team of investigators was drawn mainly from the United States and the British Commonwealth, but soon included research workers from Continental Europe, Asia and South America. Her passionate internationalism is one of her principal characteristics; at the last count physicians from no fewer than twenty-eight countries have spent time in her department.

In 1959, Sheila left her beloved Hammersmith to take up the challenge of a Professorship of Medicine at the Royal Free Hospital. Accompanied by Barbara Billing (now Professor), her biochemical colleague of many years, she set forth, with characteristic energy and determination, to build a medical unit from scratch in a school which had made its reputation through clinical excellence but, until then, had not had a Professor of Medicine.

The Academic Department at the 'Old' Royal Free was lodged in the most modest of accommodations, perched on a roof overlooking London. Access to it was as difficult as to find the centre of the maze at Hampton Court. The porters at the main entrance were cordial enough, but any enquiry about how to reach the Department of Medicine brought forth the most confused series of directions I have ever heard. To a plea to have these repeated, the most common response was 'follow the signs'. But where were they? Waving vaguely toward a dark and dingy corner of the courtyard, the disinterested porter retired to his sentry box. The best advice on getting to the Academic Department of Medicine, or The Hut, as the facilities were appropriately called, was that given to me by one of Sheila's loyal secretaries, Sue Lees, 'when you get to the roof, keep going!'

Trained in the austere medical corridor at Hammersmith, Sheila was unfazed by her make-shift surroundings. Soon The Hut was buzzing with research workers and lecturers, doing biochemistry and clinical work, plotting graphs, looking down microscopes; all were imbued with the enthusiasm that is so characteristic of Sheila's laboratory. The department was soon bursting at the seams, but there was no shortage of visiting fellows, who were more than willing to put up with the cramped quarters. Although Sheila did not have time to do laboratory work herself, she was, without any doubt, the prime mover in all the research that was undertaken. If she did not herself do benchwork, she was intent on seeing the results as they came in, checking, advising, encouraging, criticizing.

Weekly rounds, to which visiting dignitaries would often come, were the anchor point of the week. Sheila's rounds are a brilliant tour de force. There is no wasted verbiage, the issues are drawn, the questions asked, the matter probed. Deferring to others in the audience in matters of detail, she will summarize, synthesize and clarify the most complex of problems. All who have been to these rounds know that they have seen the master clinician-scientist at work. Although the rounds are finely tuned—woe beget the poorly prepared house physician or registrar—they are not sombre. Puffery is quickly deflated and laughter is never far beneath the surface. After rounds, the genial and ritual glass of sherry (in the early days, we were more than content to drink out of beakers) accompanies further informal discussions.

It is her extraordinary breadth of knowledge about the liver and its diseases that is remarkable. Indeed, there is very little that Sheila has not investigated and illuminated by her research: acute and chronic hepatitis from whatever cause—viruses, toxins, drugs and the accumulation of heavy metals; obstructive jaundice, both in childhood and particularly, perhaps, primary biliary cirrhosis, the portal circulation and the pathophysiology of ascites. The list is endless.

Although Sheila was among the first to use hepatic biopsy, estimation of splanchnic blood flow and retrograde injection of the biliary tract, she has always been on the lookout for non-invasive techniques that would enable her to investigate patients with minimum distress. She has developed strong and profitable associations between the departments of radiology and surgery, as well as pathology. Her joint conferences with radiologists, surgeons and pathologists, when a succinct clinical summary is followed by a sharply focussed discussion on the information gleaned from special investigations, are a model of a format now widely adopted. These clinics that Sheila conducts are among the most intellectually stimulating post-graduate exercises anywhere. Over the years she has educated radiologists, pathologists and surgeons, and their expertise and contributions, in turn, have enabled her to evaluate the advantages and limitations of investigative procedures and to perfect new ones.

In recent years immunology has been brought into the Unit to shed additional light on the pathogenesis of liver disease. Although she has collaborated with many specialists outside her own institution, she wisely prefers, whenever possible, that new disciplines and techniques be brought into the Unit for the sake of better integration.

Sheila's clinical experience in liver disease is surpassed by none. Patients come from all walks of life and from all parts of the world. Her 'waiting room'—if one may call it that—suggests the corridors of the United Nations rather than the clientele of a teaching hospital in North London. Her clinical excellence is matched by her sympathy and understanding. She does not have to lecture her students on the need to treat their patients

as people: they have only to watch her at work. Sheila's innate curiosity about men, women, and children, and what makes them tick, coupled with a prodigious memory, make it natural for her to see her patients as fascinating individuals. Whether they are bartenders from the Anchor or ballet dancers from Covent Garden, whether they are potentates from Pakistan or paupers from Pimlico, all are treated the same. No house calls; no Harley Strasse; if you want to see Sheila, perambulate to Pond Street and be prepared to wait.

To know Sheila, step into her office. As you enter and look around, you have the distinct impression that a gang of athetotic burglars was on the rampage minutes before. Chaos reigns. Her desk reminds you of an ill-managed stall in the Portobello Road. Dolls from Bangkok and incense burners from Hong Kong nestle cheek by jowl with an exquisite Famille Rose plate upon which sits an unopened bottle of Ouzo. It is only when Sheila appears, coat flapping in the breeze, walking in with a cheery hello that you realise, as she sits down, that she knows, roughly, that Mrs Jones' notes are somewhere about—a quick rustle of papers and, presto, they emerge at the top of the pile. She starts: 'Now *this* is an interesting patient. She comes from Baghdad, married a South African diamond cutter and is now divorced and works as a cleaner at the London Zoo'. And so it goes, on and on, each patient with a difficult problem who has come to the Unit to see her.

Sheila is a prodigious worker who has contributed more than 300 papers to the medical and scientific literature, as well as several books and monographs. She writes in a brisk and business-like style with the utmost clarity—which is how she thinks. More widely read than most, she can distil complex issues of uncertain resolution into simple statements based not only on her knowledge of the literature, but on massive clinical experience. It is also characteristic of Sheila that her output remains undiminished even as she approaches mandatory retirement. Her best known book, *Diseases of the Liver and Biliary System*, first published in 1955 and now in its sixth edition, is simply without peer. It is a vigorous book, splendidly illustrated and clarified by diagrams of her own design. Her friends throughout the world are mystified that, despite a hectic travel schedule, she is still able to bring out a new edition every four or five years. The book has been translated into German, Greek, Japanese, Spanish, Portuguese and Italian. It is internationally acclaimed by students and experts. One of the undoubted reasons for Sheila's productivity is that she is extremely disciplined, very well organized (the appearance of her desk notwithstanding) and does a minimum of rewriting. When the proofs come, they are corrected with despatch, at home, in far-away places, in the air, or while vacationing by the sea. In the preface to the sixth edition, recalling with nostalgic charm an earlier version, she writes: 'My daughters, Amanda and Auriole, have continued to give me the solid support which was essential if this edition was to be completed. They have now outgrown the days when they chased proofs along windy beaches, for they are now committed to their own academic endeavours. After thirty years of marriage, my husband, Dr D. Geraint James, remains the perfect consort for an academic wife'.

It is often said that physicians or scientists can be called great only if they contribute to the training and nourishment of the next generation. Sheila's success in training people in liver disease is unique. It is a rare hepatologist of the younger generation who has not 'worked with Sheila'. Many now hold professorships around the world. But when they return to London, like homing pigeons, they keep Wednesday afternoon free so they can attend, once again, Sheila's rounds at the Royal Free.

No appreciation of Sheila would be complete without mention of her immensely happy family life. In 1951, Sheila Sherlock and D. Geraint James were married. Geraint James had first met Sheila at the Postgraduate Medical School and, at the time of their marriage, he had already embarked on a career in general medicine and chest disease, and was soon to be an author of a book on infectious disease. He was also investigating the subtleties of sarcoid, a subject on which he was to become an acknowledged expert. Sheila and Gerry frequently travel the world together, he lecturing on sarcoid, immunology for the clinician, medical ophthalmology or medical history, while Sheila is discussing problems in liver disease. Their marriage is truly greater than the sum of its parts. The creative and complementary synergism is there for all to see.

While both Sheila and Gerry are intensely serious and hardworking in their professional lives, effervescent laughter, boisterous fun, and a well developed sense of the ridiculous fill out their days. Their home, first in Willesden and now in York Terrace East, is an international centre of reunion. At large parties or small, Sheila and Gerry bring together with their warm, legendary hospitality the young and the old, distinguished professors and hesitant beginners. While cricket, particularly Kent County cricket, holds Sheila more than Gerry in thrall, they are at one in their enthusiasm for tennis. Many are the visitors and friends who, expecting a relaxed weekend at their home in Hythe, find themselves kitted out in garish garb (picked up, you will find out later, at the airport in Bali) and dilapidated tennis shoes, playing vigorous and competitive tennis.

It helps to like dogs, or at least make a reasonable pretence of doing so, because there is always an ungovernable dog in the household. The first generation of dogs were called Whoopee, or some such evocative and onomatopoeic name, but with Gerry's growing enthusiasm for medical history, they are now apt to answer to Harvey.

Sheila and Gerry's two able and athletic children have known, since early childhood, all the jet setters of liver disease and sarcoid. Experienced travellers themselves—one of them was expected to learn to swim on a stopover in Hawaii—they were not only effective and charming assistants at meetings, but in addition, and since the age of about ten, were the most accomplished of slide projectionists.

Dr Richard Smallwood (Australian hepatologist) wrote (Smallwood 1978):

Trips to international meetings were exhilarating. The Sherlock stable always seemed to have a number of papers on the programme, and so a large contingent would set off for Gothenburg or Prague or somewhere else exciting. The Fellows presenting were exhaustively rehearsed within the unit before being let loose on a wider audience, so that their presentations were clear, confident, and informative. It was in preparation for these meetings that most of us developed our first understanding of how to construct and deliver a scientific paper. I remain impressed to this day with the standard of presentation of Royal Free papers, even if at times I argue against their conclusions. I find nowadays when I attend a liver meeting that I miss the support and camaraderie which being a member of such a unit brings. I miss the heady feeling which was so strong when I was a Fellow, the feeling that here was the centre of things, and that everything new in liver disease was happening around me. There was a momentum behind our activities which inevitably sprang from the Prof's drive and energy, a momentum which, I suspect, most of us have found hard to maintain since we left. Perhaps the best testimonial to the widespread influence of the Unit is the number of ex-Sherlock trainees who abound wherever people gather to talk about the liver.

Dr Hans Popper, Member of the US National Academy of Sciences, wrote (Popper 1983):

It is a labour of love to attempt to do justice to a personality like Professor Dame Sheila Sherlock—to describe her achievements, her scientific contributions, her career and her person.

At the end of World War II, when Sheila entered the field of hepatology, the term was not yet accepted, at least not in Anglo-American and German countries. The biology of the liver had been widely studied as a model to explore general, but not specific hepatic principles. Classic textbooks on liver diseases had been written by great physicians who would have been violently opposed to restriction of their activities to liver disease. Hepatic tests were not yet routine clinical procedures. The aetiology of viral hepatitis spreading during this as during previous wars was mysterious. Imaging methods barely existed and hepatic circulation was studied in animal experiments. The classification of liver diseases was based on autopsy material, and wider use of liver biopsy had just been introduced by Danish and German physicians.

After the war, hepatology gradually emerged due to several developments; all of them carry the stamp of Sheila. Her biologic studies of the liver, instead of being directed to general principles, became tools in the management of patients with liver disease when animal experimental techniques were applied at the bedside. Furthermore, she took full advantage of the unexpected successes in immunology and more recently in molecular biology. These successes have culminated in the hepatitis B vaccine, promising to eventually eliminate the bulk of hepatocellular carcinoma. She pioneered the wide application of liver biopsy, which led to the modern classification of liver diseases, aided by the availability of hepatic tests. The Havana Classification of Cirrhosis was formulated under her leadership, and the modern concept of chronic hepatitis has been greatly determined by the work at the Royal Free Hospital. The improved international communications after World War II led to the appreciation that liver diseases, such as hepatocellular carcinoma, are a major public health hazard in the developing countries. The social impact of liver diseases became recognized, such as the effect of malnutrition, studied by Sheila in Germany after the war, the role of alcohol abuse, and the side effects of therapeutic and addictive drugs.

Centres for the study of liver diseases, combining clinical investigations with basic science studies of increasing sophistication, developed all over the world. But there seems to be agreement that the leading and most successful school is the one created by Sheila, initially at the Royal Postgraduate Medical School at Hammersmith and brought to bloom at the Royal Free Hospital School of Medicine. Most impressive is the

large list of her co-workers who became leading authorities in hepatology, not only in the United Kingdom but, even more, on the European continent, in the United States, and in other parts of the world. Today it is a recognized badge of distinction for an hepatologist anywhere to have spent some time in Sheila's Department. The start of hepatology as a discipline probably dates from the creation of the International Association for the Study of the Liver, of which she was the founder and first President. The cooperative relation of the developing hepatology to its sister and, in part, mother discipline of gastroenterology is reflected in Sheila's successful editorship of *GUT* from 1967 to 1975 and her past presidency in the British Society of Gastroenterology. The story of hepatology is indeed a description of Sheila's work.

Here is neither the place nor the space to dwell on the scientific achievements of Sheila and her co-workers. Of far-flung work, only a few highlights are being selected to sketch her intellectual progress. In short, concepts were developed as well as methods to investigate them. Her early biopsy studies included morphological changes in viral hepatitis, in congestive heart failure, and in sarcoidosis. These clinical/pathological correlations were accompanied by biochemical investigations, initially of carbohydrate metabolism in animals and man, using in the latter very early hepatic vein catheterization to relate hepatic blood flow to carbohydrate metabolism. The investigations of hepatic and splanchnic blood flow and its disturbance in disease led to studies of ascites formation and portal hypertension. In the former, work on colloid osmotic and hydrostatic pressure involved diuretic therapy and its possible adverse effects. The present concept of the mechanism of portal hypertension in cirrhosis is based on her investigations, which also covered extrahepatic portal vein obstruction and the Budd-Chiari syndrome. She has also been leading in the management of bleeding oesophageal varices, recently by obliteration of oesophageal veins by transhepatic and endoscopic methods. The study of disturbances of hepatic circulation in cirrhosis led to the clarification of portosystemic encephalopathy, primarily by elucidation of the role of ammonia bypassing the liver. Thus, she detected abnormal anastomoses between splanchnic and portal circulation as cause of correctable mental disorders. In addition, she investigated the mechanism of fulminant hepatic failure and the associated disorders of renal and intrarenal blood-flow.

In her early work on the natural history of viral hepatitis, cholestatic episodes were emphasized, and from this followed continued interest in cholestasis and jaundice along four lines. The first entailed mechanism and diagnosis of altered bilirubin and bile acid metabolism, including Gilbert's syndrome and benign recurrent cholestasis. The second was characterization of cholestasis, where the diagnosis was recently standardized by the use of cholangiography, both transhepatic and retrograde. The third interest concerned jaundice and other liver diseases induced by drugs, where a previously confused field was clarified. She led in the acceptance of hepatotoxic effects of anaesthetic agents, particularly halothane. She also concerned herself with the cholestatic consequences and hepatic tumours following oral contraceptives. The fourth main line was primary biliary cirrhosis; the mitochondrial antibody test permitted a better evaluation of its evolution, foremost the recognition of the presymptomatic stage, which indicated a much longer life span of the disease than previously assumed. Concepts about the pathogenesis included the role of impaired delayed hypersensitivity, of immune complexes, and of the participation of other organs in the dry-gland syndrome and especially the immunologic basis of the disease. These investigations facilitated evaluation of therapy by penicillamine, greatly clarified but not fully established, as well as the management of the associated bone disorders by vitamin D preparations. Primary sclerosing cholangitis, often associated with ulcerative colitis, was delineated by cholangiographic studies, as was the disturbance of copper metabolism in cholestatic disorders.

In the last years, all aspects of chronic active liver disease and its sequelae have been in the centre of her group's interest. This included the delineation and description of the course of its various types, such as chronic hepatitis B, autoimmune hepatitis, and hepatitis non-A, non-B, all of which were investigated by new immunologic techniques. An immune defect was identified as the cause of chronicity, at least in hepatitis B—a concept of far-reaching implications in the understanding of the disease. These elaborate immunologic investigations, assisted by meticulous clinical, laboratory, and histologic analyses of the various stages, led to well executed clinical trials, including immunosuppressive therapy, particularly by corticosteroids, which together with other trials, such as at the Mayo Clinic (initiated by her long-time co-worker Summerskill) and in Denmark, provide today's indications. This is at present supplemented by exploration of the potential of specific antiviral agents in e antigen positive chronic hepatitis. She was the first to describe, on the basis of clinical observations, the association of hepatocellular carcinoma with hepatitis B infection, and this was followed by molecular biologic investigation of this relation as well as by therapeutic attempts.

This short review, which omits investigations on alcoholic liver disease, evaluation of liver function tests, and many case reports making important biological points, is intended to tell of the breadth and depth of Sheila's interests and achievements which have fertilized virtually all aspects of liver disease and hepatic biology.

More challenging and more subjective is an evaluation of her professional and personal attributes. Foremost is her legendary ability to rapidly recognize the salient point in an, often confusing, abundance of concepts and observations. This ability to grasp the essential is reflected in her oral and written teaching. This rare gift, coupled with boundless energy and an impressive memory, appears to be the secret behind her authoritative and most popular textbook of *Diseases of the Liver and Biliary System*, which is in its 6th edition, each effectively reworked, and has been translated into many languages. The concise presentation, which sharply focuses on the important and eliminates the unimportant points, has made this textbook not only a monument to her achievements but also renders it equal and even superior to the many excellent multi-authored larger tomes in the same field. Her conciseness is reflected also in her research work and makes each of her many, now probably approaching 600, papers and books a pleasure to read. Thirdly it makes her a superb speaker; any of her presentations, whether at a simple postgraduate course or at a sophisticated symposium, is exciting because of the clarity and the meticulous organization so that even the expert learns new aspects from each of these frequent presentations. Finally it permits her to be the supreme moderator and organizer of scientific symposia, so well illustrated in the yearly Update series at the Royal Free. No wonder that she is a sought-after speaker on any national and international symposium, particularly since she is willing to travel widely and cross oceans readily and thoroughly enjoys her worldwide journeys.

What are the personal attributes of this remarkable lady? From the emphasis on conciseness of thinking, courage of conviction, and unbounded professional energy, one would expect a hard disciplined woman with only limited interest in the trivial enjoyments of life. It is therefore surprising to find an unusually warm woman, interested for instance in the personal welfare of her co-workers and colleagues. She enjoys, with the same intensity that she exhibits in her professional work, all the pleasures of life, a fine meal, the seeing of sights, and a good joke. She is a member of a tightly knit family which shares with great enthusiasm all her pleasures and successes. Her husband of 32 years, Dr D. Geraint James, Dean of the Royal Northern Hospital and one of the leading physicians of London, is a strong personality in his own right, a leader in the field of sarcoidosis and in immunology. Moreover, he has become one of the most erudite historians of medicine. Sheila and Gerry support and complement each other. Thus, an evening in their hospitable home in London or on one of their many trips is a rare treat. She is a proud mother of two daughters who have grown into charming young ladies. Last but not least, Sheila is a great friend to many of us; it is a privilege to count her as one of mine.

I wonder whether I did indeed do justice to this unique person who is bound to continue her exemplary success in coming years, as all of us in the community of hepatology and in all of medicine sincerely wish. This is the place to thank her for all she has done for our field, and also to express my own gratitude for all the inspiration and friendship which I received from Sheila.

APPOINTMENTS

- 1941 Assistant in Surgery to Professor Sir James Learmonth, Edinburgh
- 1942 House Physician to Dr (later Sir) John McMichael FRS (1957), Hammersmith Hospital, Postgraduate Medical School, London
- 1942–47 Medical Research Council then Beit Memorial Research Fellow, Hammersmith
- 1948 Rockefeller Research Fellow, Yale University
- 1949–59 Lecturer in Medicine and Honorary Consultant Physician, Hammersmith Hospital, Postgraduate Medical School, London
- 1959–83 Professor and Head of Medicine, Royal Free Hospital School of Medicine, University of London and Honorary Consultant Physician, Royal Free Hospital
- 1983–2000 Emeritus Professor of Medicine, Royal Free and University College Medical School, University College London

490

Biographical Memoirs

DEGREES

1941 MB BChir (Edin) *summa cum laude*
1947 MD (Edin) Gold Medal
1943 MRCP
1951 FRCP
1958 FRCPEd

HONOURS

1978 DBE

HONORARY DEGREES

1977 DSc, City University of New York
1981 MD, Lisbon
MD, Oslo
1982 LLD, Aberdeen
1983 DSc, Yale University
1984 MD, Leuven
1985 DSc, Edinburgh
1989 DSc, London
1991 MD, Barcelona
MD, Mainz
1992 MD, Trinity College Dublin
1994 MD, Valladolid
1995 DSc, Cambridge
MD, Wisconsin
MD, Santiago de Chile
1996 MD, Padua
MD, Toronto
1998 MD, Oviedo

HONORARY FELLOWSHIP OF PROFESSIONAL COLLEGES

1984 FACP
FRCP
FRACP
1986 FRCPI
FRCPS
1989 FRCS

HONORARY FELLOWSHIP

1999 Imperial College, London

HONORARY MEMBERSHIP AND FELLOWSHIP OF PROFESSIONAL
AND SCIENTIFIC SOCIETIES

1963	Gastroenterological Society of America
1965	Gastroenterological Society of Australasia
1968	Gastroenterological Society of Mexico
	Gastroenterological Society of Czechoslovakia
1973	Association of American Physicians
	Association of Alimentary Surgeons
1981	Gastroenterological Society of Yugoslavia
1983	Gastroenterological Society of Sweden
1990	The Physiological Society
1992	Alpha Omega Alpha Association
1997	Royal Society of Medicine

OTHER ACADEMIC DISTINCTIONS, HONOURS AND AWARDS

1941	Ettles Scholar, Edinburgh University
1947	MD Gold Medal, Edinburgh University
1953	Buxton Brown Lecturer, Medical Society of London
1961	Bradshaw Lecturer, Royal College of Physicians
1962	William Cullen Prize, College of Physicians Edinburgh
1968	Rolleston Lecturer, Royal College of Physicians
1978	Lumleian Lecturer, Royal College of Physicians
	Hunterian Lecturer, Hunterian Society
1979	Thannheuser Prize and Lecturer, German Society for Nutrition and Metabolism
1980	Jiminez Diaz Prize and Lecturer, Madrid
1983	Fothergill Gold Medal, Medical Society of London
1985	Harveian Lecturer, Royal College of Physicians
	Gold Medal, British Medical Association
1986	Annual Lecture, Canadian Liver Foundation, Toronto
1994	Linacre Lecturer, St John's College, Cambridge
1998	Held Lecturer, Beth Israel Hospital, New York

PROFESSIONAL AND ACADEMIC OFFICES HELD

1958	Founder and President, International Association for Study of the Liver
1964–69	Councillor, Royal College of Physicians
1967	President, European Association for the Study of the Liver
1967–75	Editor, <i>Gut</i>
1970–72	Censor, Royal College of Physicians
1971	Founding Member, Digestive Disorders Foundation (Vice-President in 1985)
1972	President, British Society for Gastroenterology
1976–77	Senior Censor and Vice-President, Royal College of Physicians

- 1976–81 Member of the Senate, University of London
 1984 Founder and Editor, *Journal of Hepatology*
 1988–2001 President, British Liver Trust
 1990–98 President, Royal Free Hospital School of Medicine

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| (3) | (41) | 1954 | (With W.H.J. Summerskill, L.P. White & E.A. Phear) Portal-systemic encephalopathy: neurological complications of liver disease. <i>Lancet</i> ii , 453. |
| (4) | (42) | 1955 | (With L.P. White, E.A. Phear, & W.H.J. Summerskill) Ammonium tolerance in liver disease. Observations based on the catheterization of the hepatic veins. <i>J. Clin. Invest.</i> 34 , 158. |
| (5) | (69) | 1957 | (With A.M. Dawson & J. McLaren) Neomycin in the treatment of hepatic coma. <i>Lancet</i> ii , 1263. |
| (6) | (75) | 1958 | (With J.F. Murray, & A.M. Dawson) Circulatory changes in chronic liver disease. <i>Am. J. Med.</i> 24 , 358. |
| (7) | (167) | 1965 | (With J.G. Walker, D. Doniach & I.M. Roitt) Serological tests in diagnosis of primary biliary cirrhosis. <i>Lancet</i> i , 827. |
| (8) | (180) | 1966 | (With D. Doniach, I.M. Roitt & J.G. Walker) Tissue antibodies in primary biliary cirrhosis, active chronic (lupoid) hepatitis, cryptogenic cirrhosis and other liver diseases and their clinical implications. <i>Clin. Exp. Immunol.</i> 1 , 237–262. |
| (9) | (244) | 1970 | (With R.A. Fox, S.P. Niazi & P.J. Scheuer) Chronic liver disease and primary liver-cell cancer with hepatitis-associated (Australia) antigen in serum. <i>Lancet</i> i , 1243–1247. |
| (10) | (266) | 1971 | (With G.C. Cook & R. Mulligan) Controlled prospective trial of corticosteroid therapy in active chronic hepatitis. <i>Q. J. Med.</i> 40 , 159–185. |
| (11) | (269) | | (With S.P. Parbhoo, J. Kennedy, I.M. James, L.J. Chalstrey, A. Ajdukiewicz, P.J. Brock, C. Xanalatos & P. Sayer) Extracorporeal pig-liver perfusion in treatment of hepatic coma due to fulminant hepatitis. <i>Lancet</i> i , 659–665. |

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- (13) (290) 1972 (With F.J. Dudley & R.A. Fox) Cellular immunity and hepatitis-associated Australia antigen liver disease. *Lancet* **i**, 723–726.
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