Patrick Manson (1844–1922) was born at Oldmeldrum, eighteen miles north of Aberdeen. His father was manager of the local branch of the British Linen Bank and Laird of Fingask, while his mother was reported to be a distant relation of David Livingstone (see Chapter 1). Manson was the second son in a family of three boys and four girls. During his childhood he was keen on natural history, and later took to fishing and shooting. In 1857, when he was thirteen, the family moved to Aberdeen, where he attended the Gymnasium School and later the West End Academy. At fifteen years of age he was apprenticed to Blaikie Brothers, ironmasters, based in Aberdeen; however, whilst there he developed what was probably vertebral tuberculosis (Pott’s disease of the spine), which necessitated a prolonged period of rest.

In 1860 Manson entered the University of Aberdeen, qualifying in medicine at the age of nineteen; however, he was too young to graduate and in the meantime travelled to London and visited various hospitals, medical schools and museums. Graduating in October 1865, he was appointed medical officer to the Durham Lunatic Asylum, where he stayed for a mere seven months. In July 1866 he obtained the MD degree of Aberdeen University, and later that year he applied for and was appointed to a post in the Chinese Maritime Customs.1
Chinese Maritime Customs

Manson sailed for Formosa (now Taiwan) and for five years inspected ships calling at the port. In addition to treating their crews, he kept careful meteorological records; he also built a private practice consisting of both European and Chinese patients, and attended a native missionary hospital daily. Riding, gardening, bathing and fishing in the lagoon were leisure activities. Figure 3.1 shows him while in China.

In 1871 Manson moved from Takao to the large port of Amoy on the Chinese mainland, and stayed there for thirteen years (see Figure 3.2). Here, he had medical charge of shipping and a hospital for European seamen; he also served the Baptist Missionary Society’s Hospital (where his research interests were apparently frowned upon), and a Dispensary for Chinese in the native quarter. Manson also carried out a great deal of surgery at this time, including many lithotomies. He wrote about some of the local diseases in the Medical Reports of the Imperial Maritime

![Figure 3.1](image-url) Patrick Manson at the age of 31 years (reproduced courtesy of The Wellcome Library, London).
Customs, and invented an apparatus for draining liver ‘abscesses’. He also recorded tropical malabsorption and applied, probably for the first time in English, the Dutch term Sprouw – then in use in Java, Dutch East Indies – to describe this entity. However, this was not a milieu in which to embark on research, as there were no libraries or museums, and no scientific meetings.

**Filariasis research**

Manson had seen a good deal of elephantiasis as well as scrotal disease (which he operated upon) at Amoy, caused by both *Wucheraria bancrofti* and *Brugia malayi*. While on leave in Britain in 1874–5, he pursued a literature research into this disease; he also met Timothy Lewis (1841–86; see Chapter 1), who had demonstrated ‘embryos’ (microfilariae) of *W. bancrofti* in both urine and peripheral blood, as well as adult nematodes in an elephantoid scrotum. ‘Embryos’ of this organism – *Filaria sanguinis hominis* – had previously been visualized by the French surgeon, J N Demarquay (1814–75), in hydrocele fluid in 1863. Simultaneously, Joseph Bancroft (1836–94), working in Brisbane, Australia, had demonstrated both ‘embryos’ and also adults of this helminth, and it was Spencer Cobbold (1828–86), the foremost helminthologist in Britain, who first named the organism *Filaria bancrofti*.

![FIGURE 3.2 Manson’s house in Amoy (reproduced courtesy of The Wellcome Library, London).](image)
When Manson returned to Amoy (Figure 3.3) in late 1875 or early 1876, he therefore knew a good deal about the cause of elephantiasis. But how did Homo sapiens become infected? By late 1877, Manson had examined 670 ‘natives’ and found that, overall, one in every 10.8 was infected with Filaria sanguinis hominis; the number increased from 1:17.5 in those aged 10–20 years to 1:3 in those more than 70 years old. The ‘embryos’ were sheathed, but when cooled with ice the sheath ruptured and they swam freely; this suggested to Manson that part of the lifecycle took place outside the human body. Knowing that his servant, Hin Lo, had a high concentration of ‘embryos’ in his peripheral blood, he carried out an experiment on 10 August 1877 – a date some designate as the date upon which the formal discipline of tropical medicine ‘took off’, although others trace this to Manson’s letter to T S Cobbold dated 27 November of that year.

This piece of clinical investigation – which modern ethical committees might well frown upon! – went as follows. Mosquitoes (Culex fatigans) were attracted into a mosquito-proof ‘cage’, using a candle, then Hin Lo slept in the closed cage overnight (see Figure 3.4). The following morning the cage was opened and the mosquitoes were collected and dissected by Manson, when they were found to possess a high concentration of ‘embryos’ in their stomachs. The result of this experiment was communicated to Cobbold in London in Manson’s letter dated 27 November. The next step was to demonstrate the development of the ‘embryos’
in the mosquito. The series of events was communicated to the Linnean Society in 1884. Manson also studied the nocturnal periodicity of the ‘embryos’.6

Manson had thus elucidated the man–mosquito component in transmission of a human pathogen for the first time, and this paved the way for mosquito–involvement in malaria (a protozoan disease) and yellow fever (a viral disease). The mosquito–man dimension of the cycle was not, however, elucidated by Manson, but much later by G C Low (see Chapter 8).7

Whilst in Amoy, Manson also carried out research on the life-cycles of several other helminths – including: Distoma ringeri, Paragonimus westermani, Filaria immitis, several other filariae, and Bothriocephalus (Diphyllobothrium) mansoni.8

Hong Kong and medical education

Following leave in Aberdeenshire in 1883, Manson and his family (he had married in December 1875 and by now had a son and daughter) left not for Amoy but for Hong Kong. There he built up a substantial private practice, operated at the Civil and Memorial Hospitals, and became President of the local Medical Society. In addition, he carried out several altruistic roles.

Manson’s major contribution while in Hong Kong was, however, in the field of medical education. He established a school of medicine within the
Alice Memorial Hospital; this formed the focal point of the present Medical School, which was absorbed into the University of Hong Kong in 1911. In late 1886 he became Chairman of the Hospital Committee, and the following year was elected Dean of the proposed College of Medicine for the Chinese. In 1886 he had been joined by the surgeon Mr (later Sir) James Cantlie (1851–1926; see Chapter 7), who was later to play an important part in the early years of the London School of Tropical Medicine (see below).

In 1889, having accumulated a good deal of wealth from his private practice, and after 23 years in south-east Asia, Manson decided to retire to Scotland. However, by 1890 the Chinese dollar had depreciated catastrophically and, primarily for financial reasons, he moved to and pursued a new career in London.

**LONDON LIFE AND FOUNDATION OF THE LONDON SCHOOL OF TROPICAL MEDICINE**

Manson was 46 years old when he started a new career, having moved into 21 Queen Anne Street, W1, which was to be his family home for 23 years. He built up a library and small laboratory there, while his income resulted from a private practice which proved slow to take off. In 1890 he passed the MRCP examination, and five years later he was elected FRCP. A ‘blue plaque’ has been erected on the front elevation of 50 Welbeck Street, W1 (see Figure 3.5), where Manson lived briefly following his removal from 21 Queen Anne Street.

**FIGURE 3.5** Blue plaque on the front elevation of 50 Welbeck Street, W1, briefly the London home of Manson following his removal from 21 Queen Anne Street.
The significant breakthrough came in May 1892, when he was appointed Physician to the SHS (see Chapter 20), with fifteen beds at the newly opened Branch (Albert Dock) Hospital (ADH). Whilst in China, and in London for two years, Manson had carefully followed the ‘malaria saga’ which had begun with Alphonse Laveran’s (see Chapter 4) demonstration of *Plasmodium* spp. in a blood sample in Algeria in 1880. Two years later, in 1894, he was invited to give the Goulstonian Lectures to the Royal College of Physicians; these dwelt on the possible role of the mosquito in conveying the infection to *Homo sapiens* (in a similar way to his own observation(s) on lymphatic filariasis carried out some years before at Amoy) and were published in both the *Lancet* and the *British Medical Journal*. There is in retrospect no doubt that this induction (hypothesis) subsequently had a profound influence on Ross’s work (see Chapter 5). During this time Manson also carried out research on several helminthiases – largely on blood samples and slides sent to him from various tropical locations – and also took a great interest in African trypanosomiasis (see Chapters 8, 9 and 11).

**Manson’s lectures**

Arguably, teaching about tropical diseases was equally as important, if not more so, than Manson’s research interest in protozoan and helminthic infections.

On 1 October 1892, Manson, now a Lecturer on Tropical Diseases at St George’s Hospital, delivered an address on the importance of education in tropical medicine. That had been preceded by a series of lectures from May to July of that year, the course being ‘intended for medical men intending to practice in the tropics or in Eastern Asia’. He felt that courses of lectures on tropical diseases (‘the hygiene and diseases of warm climates’) should take place at all UK-based teaching hospitals (which incidentally still doesn’t happen today), and that this should be encouraged by the British Government, who should take cognizance of certificates issued by the authorities promoting those lectures when selecting medical officers for the Colonies. In 1898, several years after his lectures (which began in 1892), he published his well-known monograph; the twenty-second edition of this book is currently in preparation.

It is not known whether the Rt Hon Joseph Chamberlain FRS (1836–1914; see also Chapter 20) was purposely made aware of Manson’s efforts to establish this new discipline, or discovered it by chance. It is, however, known that Chamberlain wrote to the Dean of St George’s (Sir Isambard Owen) with a request that a notice of Manson’s lectures be distributed to Colonial Surgeons who were on leave in Britain. Thus he had the support of a leading politician who felt that Manson’s strategy (i.e. the prevention and cure of tropical disease in the servants of Empire) furthered his concept of ‘constructive imperialism’ – unlike the lukewarm or downright opposition and hostility which he received from many of his colleagues.

**The foundation of the London School of Tropical Medicine**

In July 1897 Manson was appointed (presumably at Chamberlain’s recommendation) as Medical Officer of the Colonial Office following the recent resignation
of the previous incumbent, Sir Charles Cage-Brown. Manson thus had to devote far more time to administration – not since his Hong Kong days had this been his dominant activity – but he still managed to deliver a number of public addresses highlighting the importance of teaching about tropical diseases. The first the Seamen’s Hospital Society (Manson’s principal employer) heard about Manson’s proposed scheme was in May 1897, when he apparently conveyed his thoughts to P J (later Sir James) Michelli (1853–1935), Secretary of the SHS.

FIGURE 3.6 Ordnance Survey map showing the location of the Albert Dock Hospital (ADH) in 1895. The large arrow indicates the site of the ADH, and the smaller arrows the location of the nearest railway stations.
In February 1898, the SHS Committee of Management received the following letter (signed by H Bertram Cox) from the Colonial Office:

Sir, The question of improving the medical service of the British Colonies in West Africa has been receiving Mr Secretary Chamberlain’s serious consideration [the Rt Hon Joseph Chamberlain was the British Secretary of State for the Colonies from 1895 until 1903]. At present the newly appointed medical officers receive no special training in the diagnosis and treatment of tropical diseases [my italics] before they proceed to West Africa and, although an attempt is made to give them whenever possible some preliminary instruction at the Headquarters Hospital of the Colony, this course cannot be followed in every case and the arrangement is, on the whole, unsatisfactory.

He continued:

He is advised [presumably by Manson] that the experience and training to be obtained at the Seamen’s Hospital [at the Albert Docks; see Figures 3.6 and 3.7] would be the most suitable in the present instance, and he would be greatly obliged to the Managing Committee if they could give him their valuable assistance in the matter.

The letter suggested further that the Foreign Office should also be involved:

The Secretary of State for Foreign Affairs is being asked whether it is wished that the Protectorates in East and West Africa, at present administered by the Foreign Office, should

FIGURE 3.7  Engraving of the Albert Dock Hospital before the addition of the LSTM (reproduced courtesy of The Wellcome Library, London).
be included in the proposed scheme, but, in any case, it is not probable that more than six officers would be under instruction at any one time.

It was envisaged by Manson (with Chamberlain’s support) that, provided the ADH was enlarged, this could form the nidus for a School to house the intended specialty. The facts of the matter were ‘laid before the public’ by (Sir) Henry Burdett, a former Secretary and now a Vice-President, on behalf of the SHS in a letter to the *Times* in July 1898, the SHS’s Committee having already (in February) approved these plans in principle.17

The proposed London School of Tropical Medicine (LSTM) was sponsored financially by the Government and the Royal Society, and received strong support from Chamberlain and indeed the Prime Minister of the day – the third Marquis of Salisbury (1830–1903). However, Manson received a great deal of criticism from several colleagues, including John Curnow (1846–1902) and John Anderson (1840–1910), both physicians, and George Robertson Turner (1855–1941), a surgeon, at the Dreadnought Hospital. Their criticism fell under three headings:

1. A belief that other venues, such as the Royal Victoria Hospital at Netley and the Royal Naval Hospital at Haslar, were eminently more suitable for a tropical school
2. That establishment of the LSTM at the ADH would deprive the Dreadnought Hospital of most of its ‘tropical’ cases
3. That the scheme as outlined contained hidden allegations that they were themselves incompetent in their dealing with ‘tropical’ cases.18

In retrospect, these colleagues were correct in believing that there would never be great numbers of ‘tropical’ cases at the ADH; this hospital had in fact been founded in London’s docklands to deal with morbidity (most importantly injuries) suffered by the local personnel employed there.19 However, with Chamberlain’s wholehearted support the venture blossomed, and the LSTM was firmly established at the ADH, opening its doors on 2 October 1899.

**Later life**

Following retirement in July 1912, Manson travelled to Ceylon (now Sri Lanka) and later South Africa and Southern Rhodesia (now Zimbabwe). In 1914 he moved to County Galway, Ireland, where he occupied his leisure hours fishing and gardening. Figure 3.8 shows him in old age. Manson was a sufferer of severe gout throughout his latter years, and he died on 9 April 1922 after suffering from myocardial ischaemia for about a year. After a memorial service at St Paul’s Cathedral, London, he was buried at Allendale Cemetery, Aberdeen.

There are other events which should be incorporated for completion of the father of (modern) tropical medicine’s career. In 1904 he narrowly missed being elected to the Regius Chair of Medicine at Oxford (the successful candidate
was in fact Sir William Osler (1849–1919). He was appointed CMG in 1900, KCMG in 1903 and GCMG in 1912. Manson also received honorary degrees from the Universities of Oxford and Cambridge. Figure 3.9 shows a plaque at the Hospital for Tropical Diseases, London, commemorating Manson. Clearly, Manson’s two major contributions were:

1. Elucidation of the role of the mosquito in transmitting the parasite(s) causing lymphatic filariasis (which was followed by similar work on malaria and yellow fever)
2. Foundation of the London School of Tropical Medicine.
The rapidity with which understanding of tropical disease advanced in the late nineteenth and early twentieth centuries is well illustrated in Manson’s inaugural lecture to the (Royal) Society of Tropical Medicine and Hygiene in 1907.

Manson, after apologizing for his lack of preparation, assured his audience that he was ‘fast approaching the end of [his] career’; he was in fact already 63 years old. The first object of the newly-formed Society, he claimed, was ‘to bring together the men who are interesting themselves in tropical medicine’. He continued:

Although domiciled in the Metropolis, it is open to any member of the profession [wherever he is based], and … to those followers of any science or profession capable of forwarding, directly or indirectly, the interests of tropical medicine.

He emphasized that the Society should be broad-based, and was dependent on, especially, ‘the various branches of natural history’ (see Chapter 2).

Manson also spoke of rapid advances in the discipline which ‘within the last few years … has been as remarkable as it has been great’. In justifying this statement, Manson compared the state of tropical medicine in 1907 with that in Davidson’s *Hygiene and Diseases of Warm Climates* published in 1893. In 1883, due to faulty techniques while in China, he totally failed to find Laveran’s parasite; it was not until 1889, when he was at the Seamen’s Hospital, that he became convinced of the importance of that observation. The section on tropical medicine in the recently published edition of Allbutt’s *System of Medicine*, edited by Humphry Rolleston, was in large part, he continued ‘occupied with the part played by the mosquito in the malarial drama’.

He then referred to other advances – Almroth Wright’s immunization for typhoid, ‘Zammit’s discovery that the “germ” of Malta fever [brucellosis] is eliminated in the milk of apparently healthy goats’, the ‘dependence for propagation of [yellow fever] on the offices of [the] stegomyia mosquito’, and the rediscovery of ‘the role of the rat in [the] diffusion [of plague]’. Manson spoke of recent advances in the understanding of sleeping sickness (the ‘negro lethargy’); it was by then known, he claimed, that this trypanosomal disease was ‘to some extent [amenable] to arsenic, mercury and certain dyes’.

He claimed that the ‘tropical fluxes – diarrhoea and dysenteries – [constituted] the most important [unsolved] department of tropical medicine’, despite the fact ‘that the amoeba is creeping into favour [and the] bacillus dysenteriae [had by then been recognized]’. He stated that sprue ‘remains a mystery’, although undoubtedly ‘a specific disease’. There were, he claimed, ‘Still spurs to be won in this field of the tropical fluxes’, adding that the ‘specific relation of the amoeba to a certain type of dysentery and to liver abscess may now be regarded as thoroughly established’.

Of the helminthic diseases, ‘Looss’s discovery [see Chapter 10] that the larval ankylostome obtains access to the intestinal canal by penetrating the
skin on the surface of the body’, ‘Leiper’s experimental demonstration that the
guinea-worm may be acquired through swallowing its Cyclops intermediary’,
the discovery of two new parasites (Schistosomum japonicum and Amphistomum
watsoni), and the ‘linking up of the larval Filaria diurna with its parental Filaria
loa [together with its causative relationship to Calabar swellings]’ came in for
special mention.

Kala azar was ‘absolutely unknown’, he continued, when Davidson’s text
was written. The modern textbook, Manson claimed, must also ‘have chapters
on spirillosis’, because ‘relapsing fever’ covered several infections. Speaking of
entomology, in Davidson’s day, he continued, ‘a single culex was all that we had
to bother ourselves about; but nowadays we have to know something about some
600 species of mosquitoes’!

Manson concluded by emphasizing how His Majesty King Edward VII’s
Government had shown its interest both at home and abroad by assisting with
the establishment of new Tropical Schools and laboratories, and by calling an
International Conference on sleeping sickness. He also spoke of his personal
introduction to tropical medicine, and the fact that in 1907 – unlike the situa-
tion 30 years previously, when there was no-one to turn to and only the British
Museum library to provide information – there were ‘post-graduate classes of all
sorts’, and the (R)STMH should prove a centre (for the flying visitor, unlike those
studying the discipline at the Schools) for information and should welcome individu-
als, especially those from abroad. In fact, had the Society existed in 1893, he
would doubtless have been shown how to detect Laveran’s parasite (see Chapter
4) at that time. 22

ROSS’S ASSESSMENT OF MANSON

In 1930, eight years after Manson’s death, Ross penned his personal reminiscences (the book was ‘not meant in any way as an attack on the memory of Manson’) of Manson, largely in order to downplay the latter’s contribution in the
genesis of his own discoveries:

We find throughout history that people who at one time were concerned in some important
work gradually grow in reputation till they become heroes of romances, and are ultimately
credited with many things which they would probably have repudiated had they lived long
enough to do so.

Ross wrote (in typical paranoid fashion), in referring to Manson’s induction,
which paved the way for his Nobel Prize-winning work, that

his praise was [at the time] exaggerated [because] it is better to err on the side of generosity
than the converse; but this was no reason why all my work in India should be attributed to
his inspiration.

Ross recalled that he first met the ‘tall handsome man with a benign expres-
sion of face’ on 10 April 1894 ‘some years before he was appointed Medical
Adviser to the Colonial Office and first suggested the establishment of [tropical] schools to Mr Joseph Chamberlain'. He described the appointment: it ‘brings only a small salary but a considerable addition to medical practice, and ... [it] helped [Manson] to advance his schemes for founding schools of tropical medicine [Ross had doubts that this ‘was entirely his own idea’] in British sea-ports’. Their first meeting, he continued, was at the suggestion of Surgeon General Sibthorpe, having ‘toiled at the subject [of demonstrating Laveran’s parasite] for several years’. Manson, who had learned the technique from Dr H G Plimmer, demonstrated the malaria parasite in fresh ( unstained) specimens. Manson hypothesized that the mosquito (or some kind of ‘suctorial insect’) might be involved in malaria transmission, as he had demonstrated in lymphatic filariasis. Ross said that he had long abandoned the ‘old theory of malarial miasmas’, but he later implied that Manson, even two years later (British Medical Journal 1896: 778) remained ‘under the influence of the miasmatic theory of malaria’, saying that he ‘believed that the mass of malaria existed in the shape of spores floating in water and blown about in the air’.

Ross then documented Fedschenko’s work showing that Cyclops was involved in the transmission of F medinensis, as well as details of Manson’s demonstration that T R Lewis’s Filaria sanguinis hominis was transmitted from the blood of man to certain species of mosquito.

He wrote that ‘Manson was always somewhat inclined to over-speculation in scientific matters’, and quoted Cobbold (1878) as writing that ‘T L [sic] Bancroft … suggested to him on 20 April 1877 [i.e. five months before Manson’s seminal experiment] that the embryos of F bancroftii might be carried by mosquitoes’. Ross also considered Manson ‘scarcely a very expert investigator’.

He was also somewhat dismissive of Manson’s textbook: ‘It is a class of book which I do not favour much’. He was of the opinion that Manson’s election to the Royal Society resulted from ‘his induction, and [his own] work on malaria’. Ross was also critical of Manson for not following up his filarial work by attempting to eradicate the infection (as he had attempted to do with malaria in West Africa); Ross claimed that his Indian work was carried out ‘in order to find a method for reducing the incidence of malaria amongst the inhabitants of warm countries’, and not for ‘the sake of parasitology’. 23
PATRICK MANSON (1844–1922)


9 *Op cit*. See note 1 above.


23 *Op cit.* See note 1 above (Ross).