‘What Science Has Done to Me’: Sir Ronald Ross’s *Memoirs: with a full account of the great malaria problem and its solution* (1923)

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**Introduction**

Sir Ronald Ross (1857-1932) was a physician, medico-scientific researcher, mathematician, novelist, poet, and polymath. For pioneering research culminating in the discovery of malarial transmission, Ross was elected to the Royal Society in 1901, awarded a Nobel Prize in 1902, and knighted in 1911.¹ While basic bibliographical and biographical groundwork has been laid by Mary E. Gibson and Edwin Nye in *Ronald Ross: Malarialogist and Polymath: A Biography* (1997), Ross’s literary output has received little attention from scholars in the Medical Humanities. In *Memoirs: with a full account of the great malaria problem and its solution* (1923), Ross disregards the accepted narrative of the self-denying scientist. Instead, he is at pains to expose to the public the emotional stress of forging new discoveries in science. Throughout *Memoirs*, Ross demands that the sacrifice required to make scientific discoveries should be recognised and rewarded. This article seeks to examine Ross’s most celebrated literary work, *Memoirs: with a full account of the great malaria problem and its solution*, to reveal Ross’s unique self-fashioning as an indefatigable medico-scientific investigator and a pioneer for the rights of researchers.

Rita Charon suggests that ‘considering autobiographies is a useful way to come to grips with the processes of telling the self’.² However, after an examination of the autobiographical works of John Stuart Mill (1806-1873), Charles Darwin (1809-1882), Anthony Trollope (1815-1882), and Francis Galton (1822-1911), George Levine concludes

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¹ Eli Chernin, ‘Sir Ronald Ross, malaria, and the rewards of research’, *Medical History*, 32(2), (1988), p. 120.
that ‘telling the self’ is an uncommon trope in scientific autobiographies. Levine instead defines the autobiographies of these men as works that strive toward a dying-to-know narrative: a narrative that combines an unreserved striving for knowledge with ‘willingness to repress the aspiring, desiring, emotion-ridden self and everything merely personal, contingent, historical, material that might get in the way of acquiring knowledge’. This distinctive autobiography allows Ross to reflect on his period of arduous scientific research, infusing it with a telling of the self, in an attempt to uncover the exploitation of the suffering scientist to his readership. A historiographic account of Ross’s life is provided to juxtapose the facts of Ross’s life before, during, and after his scientific breakthrough, with the ways in which Ross presents these periods of his life to the reader of Memoirs.

**A Historiographic Account of Ross’s Scientific Research**

In 1880, after coming to England in order to pursue an education, Ross returned to his birthplace of British India to begin working as a surgeon-apothecary for the Indian Medical Service (IMS). While on furlough in London in 1888, Ross completed a Diploma in Public Health at the Royal College of Physicians and Surgeons and a course in bacteriology at his alma mater, St Bartholomew’s Hospital School. In 1894, Ross met with parasitologist Sir Patrick Manson (1844-1922) to discuss malarial transmission. According to William F. Bynum, ‘Manson demonstrated Laveran’s parasite to Ross, introduced him to the recent malaria literature, and took him […] to see patients with the disease in London Hospitals’. Gibson and Nye explain that Manson established ‘the concept that pathogenic microorganisms could be carried over from a vertebrate host to an invertebrate host as part of the onward life of the organism.’ Ross set out to prove Manson’s hypothesis by

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4 Ibid., p. 40.
6 Bynum, ‘Ross’.
7 Gibson and Nye, p. 3.
identifying [...] the parasites in the blood of patients with malarial fever and then exposing such patients to the bites of mosquitoes, which had subsequently to be shown to pass on the parasite.\textsuperscript{8} Chernin suggests that Ross made his Nobel prize-winning discovery in large part due to 'Manson's epistolary encouragement and advice, together with considerable labour, discomfort, and personal cost'.\textsuperscript{9}

When Ross returned to India in April 1895, he eagerly made his way to the Civil Hospital in Bombay to begin his research.\textsuperscript{10} However, Ross would subsequently endure numerous encumbrances to his research. Gibson and Nye note that '[t]o some extent Ross’s efforts [...] were somewhat askew of the “right track”' due to the fact that Ross was following Manson’s theory which postulates that shortly after laying eggs in water the mosquitoes would also leave the parasite, thereby infecting the water.\textsuperscript{11} Then, in September 1895, Ross was ordered to leave Secunderabad and go to Bangalore to help with an outbreak of cholera.\textsuperscript{12} This move disturbed his research as Bangalore ‘did not provide a suitable large reservoir of malaria stricken patients to allow research on a reasonable scale.’\textsuperscript{13} In May 1896, Ross left Bangalore and made an ‘expedition to a malarious area near Ootacamund’ to research. Eventually, Ross returned to the 19th Madras Infantry in Secunderabad in June 1897.\textsuperscript{14} It was on 20 August 1897 that Ross made his crucial discovery:

He found strange cells in the stomach wall [of a mosquito] and assumed that this was a stage of the malarial parasite. [...] Ross now had the key to the whole problem. [...] He had explored every possible avenue open to him in chasing the parasite in the mosquito and his industry and perseverance paid.\textsuperscript{15}

An article on Ross’s discovery was published in the \textit{British Medical Journal} on 18 June 1898, written by Manson, entitled ‘Surgeon-Major Ronald Ross’s Investigations on the Mosquito-Malaria Theory’.\textsuperscript{16} On 25th June, despite having only tested his theory on birds, Ross could

\begin{itemize}
\item \textsuperscript{8} Gibson and Nye, p. 3.
\item \textsuperscript{9} Eli Chernin, ‘Sir Ronald Ross, malaria, and the rewards of research’, \textit{Medical History}, 32(2), (1988), p. 120.
\item \textsuperscript{10} Gibson and Nye, p. 57.
\item \textsuperscript{11} Gibson and Nye, p. 60.
\item \textsuperscript{12} Gibson and Nye, p. 62.
\item \textsuperscript{13} Gibson and Nye, p. 64.
\item \textsuperscript{14} Gibson and Nye, p. 66.
\item \textsuperscript{15} Gibson and Nye, p. 68-69.
\item \textsuperscript{16} Gibson and Nye, p. 74.
\end{itemize}
conclusively say that he had discovered how malaria was transmitted from mosquito to human. Gibson and Nye note that ‘without actually testing the role of the mosquito as vector in human malaria the parallels were so close that the outcome of further studies on man would be virtually a foregone conclusion.’

After uncovering how malaria was transmitted from mosquito to bird (and therefore human), Ross retired from the IMS, returned to England, and took up a post at the Liverpool School of Tropical Medicine.

Having made his discovery, Ross became aggressively defensive about protecting scientific priority of his discovery:

The principal object of his opprobrium was the Italian parasitologist Giovanni Battista Grassi. Grassi and several of his co-workers were actively investigating malaria in 1897 and 1898, and it was they who demonstrated the malaria cycle in human beings, shortly after Ross’s definitive work on bird malaria.

Eli Chernin points out that Ross was consumed by the idea of collecting monetary rewards for his medical research, despite receiving praise and recognition by being elected ‘to the Royal Society in 1901, [being awarded] the Nobel Prize in 1902, and [gaining] a knighthood (KCB) in 1911.’ Bynum confirms this change in Ross’s outlook, noting that ‘darker aspects of Ross’s personality intruded in the satisfaction he might have felt about the honours and fame which came to him’. Chernin documents in detail the various methods Ross attempted to gain a monetary reward: Ross expected similar treatment to Edward Jenner (1749-1823), physician and pioneer of immunology, who received £30,000 from the British Government for creating vaccinations in the early nineteenth century. Ross unsuccessfully petitioned the government for remuneration on multiple occasions. It was during this time, when he believed he was unappreciated, undervalued, and unrecognised, that Ross decided to unveil his suffering for science.

**Intended Readership of the Ross Autobiography**

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17 Gibson and Nye, p. 75.
18 Bynum, ‘Ross’.
19 Chernin, p. 120.
20 Bynum, ‘Ross’.
21 Chernin, p. 121.
Ross noted in his book proposal to Murray that the text would be ‘of interest, not only to doctors, but to all administrators’ stationed in the tropics, ‘written in a style which can easily be understood by everyone’. While writing the book proposal then, Ross imagined the text being marketed primarily to medical practitioners in the tropics, presumably because of their interest in malaria. However, Ross emphasised that it should be a text written in a popular style, perhaps comparable to *Science Progress*; a popular science periodical published by Murray that Ross was both editor of and contributor to for twenty years. While more letters regarding potential readership either were not written or are not now available, it appears that, as with the title, the intended readership shifts.

In the preface of *Memoirs*, Ross addresses the specific readership he wishes to garner: the public. He explains that his reasons are twofold. Firstly, he believes that, up to the time of writing, the medical community ‘has failed’ to disseminate his discovery of malarial transmission ‘because it is allowed little influence in the world’s counsels’. Ross believes that it is in fact the public, ‘not the doctors, who rule the world’. Secondly, he wants to dispel the ‘misconception’ generated by scientists about scientists:

> Our books of science are records of results rather than of that sacred passion for discovery which leads to them. [...] I trust, then, that this book at least will give a frank and accurate picture of one investigation, of the difficulties which attended it, and of the manner in which the world received and used, or did not use, the result.

Ross’s *Memoirs* uncovers veiled aspects of scientific research. Ross’s introduction begins by suggesting that he will present the accepted narrative of scientific research, writing only a ‘frank and accurate picture’ of the facts of his case. He aims to create a ‘narrative of deadly neutrality’, which Levine suggests is a trope of the dying-to-know narrative evident in Victorian autobiographical works. For example, Darwin’s autobiography opens by explaining that he is writing ‘as if I were a dead man in another world looking back at my own

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26 Levine, p. 13, p. 31.
life’. However, Ross then continues his list of aims for Memoirs, which includes highlighting the ‘difficulties’ of research and the reception of his discovery. The introduction then also hints at Ross’s resentment that his scientific research was not used in the way he wished by the British Government to help those with malaria. This is further emphasised in the penultimate paragraph of the preface when Ross asks for the reader’s consideration:

I pray that the book will prove to be something more than a medical tale. Perhaps the kindly reader will perceive that when my malaria-work was commenced thirty years ago as a self-imposed duty I had many ambitions closer to myself than it was.

Ross disregards the idea that his text is simply a ‘tale’ about medicine, suggesting that these are frivolous or fictional. He notes that he has sacrificed other ‘ambitions’ for what he describes as a ‘self-imposed duty’. The phrase ‘self-imposed duty’ again resonates with the accepted scientific narrative: ‘a narrative of […] self-denying progress through enormous difficulties toward a highly valued end’. In his opening address to the general reader, Ross fashions himself as a humble servant, tentatively hoping that they will understand the true cost of the scientific work described in this text and that they will accept the narrative of the forgotten suffering scientist.

Ross makes explicit in the preface that he would be subverting readers’ expectations by uncovering a unique narrative of scientific research. Ross explains that this uncovering is a direct response to fictitious narratives scientific researchers have presented to the public:

A witty friend of mine once remarked that the world thinks of the man of science as one who pulls out his watch and exclaims, “Ha! Half an hour to spare before dinner: I will just step down to my laboratory and make a discovery.” Who but men of science themselves are to blame for such a misconception? […] Our books of science are records of results rather than of that sacred passion for discovery which leads to them. Yet many discoveries have really been the climax of an intense drama, full of hopes and despairs, visions seen in darkness, many failures, and a final triumph: in which the protagonists are man and nature, and the issue a decision for all the ages.

29 Levine, p. 87.
30 Ross, Memoirs, p. v-vi.
Ross railed against the notion of the ‘fortuitous scientific accident’ as described by Rebecca Herzig.\(^\text{31}\) Herzig uses this term for narratives such as ‘Antoine-Henri Becquerel’s discovery of natural radioactivity (said to have resulted from leaving some uranium rocks in a drawer containing photographic plates) or Luigi Galvani’s theory of “animal electricity” (said to have been detected when a charged metal scalpel happened to contact the bared nerve of a dissected frog).’\(^\text{32}\) Levine suggests that scientific research actively discourages the discussion of the individual scientists’ story: science ‘does not, in its professional papers, want to hear the story of the scientists’ work on the way to the recorded experiments. The self is banished’.\(^\text{33}\) Ross abandons the notion of self-denial and rejects the alternative popular narrative of scientific research, which suggests scientific discovery is simply a case of good fortune. Instead, Ross manipulated the accepted narratives, choosing to reveal in detail the pain and discomfort that make possible these self-denying ‘records of results’. Utilising a rhetorical question at the end of the anecdote, (Who but men of science themselves are to blame for such a misconception?), Ross explained that it is men of science that mistakenly created a narrative that only credits them for their results. Ross heightens the readers’ intrigue by using hyperbolic language (‘sacred passion’, ‘vision seen in darkness’) to provide a summary of the turbulent and dramatic adventure of the suffering hero-scientist in a struggle that influences all life. Ross’s autobiography, while weaving his personal narrative about suffering for science, referenced a number of other scientists whose struggle was supposedly ignored.

**Examples of the Suffering Scientist**

Ross utilises fellow scientists’ stories of hardship to bolster his own self-fashioning as a martyr for science. One of the closing anecdotes of Ross’s *Memoirs* recounted the unfortunate death of the United States Army physician Walter Reed (1851-1902). Reed was


\(^{32}\) Ibid., p. 7.

\(^{33}\) Levine, *Dying to Know*, p. 23.
the head of a group of scientists, the Reed Commission, who were attempting to identify the cause of Yellow Fever in Cuba. Ross quotes a passage of a letter from Reed to his wife, where Reed gushed that: ‘The prayer that has been mine for twenty years, that I might be permitted in some way or at some time to do something to alleviate human suffering has been granted!’

Reed’s sense of duty and vocation in this passage is clear. Ross then bitterly reports that Reed died without any adequate honours or reward, and actually in a state of apprehension regarding the future of his wife and daughter. […] If the world refuses to pay for world-service […] it is the world that suffers – for its own folly.:

Ross revealed Reed’s narrative as a scientist dying for knowledge. He suggests that, by not providing recognition and money, Americans have disregarded Reed’s sacrifice for them.

Out of the four men that constituted the Reed Commission (Walter Reed, Aristides AgRamonte, James Carroll, and Jesse Lazear) two died after infecting themselves with yellow fever in the name of scientific research. Reed was incredibly well celebrated in his time. Herzig notes that Reed was ‘the beloved subject of dozens of sculptures, paintings, and articles. He took honorary degrees from Harvard and the University of Michigan and ultimately became the namesake of the most prestigious army hospital in the United States.’ However, just as Ross’s membership to the Royal Society, the Nobel Prize, and a knighthood were felt by him to be inadequate, by disregarding Reed’s acknowledgements, Ross insinuates that they too were inadequate. Herzig, who imagines the Reed Commission as the epitome of the notion of suffering for science, comments that:

The writings [scientists] generated reveal not only an important presumption about the relative value of scientific knowledge […] but also two far more critical claims: that the advancement of science requires painful self-sacrifice and that scientists are uniquely willing – even eager to take on this pain.

In Ross’s Memoirs, he appeared willing to take on the duty of suffering for science, but he held that his duty must be rewarded specifically with a payment from the relevant

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34 Ross, Memoirs, p. 426.
35 Ross, Memoirs, p. 426.
36 Herzig, p. 3.
37 Herzig, p. 2.
38 Herzig, p. 4.
government, so that he could have continued similar scientific research. In addition to Reed, Ross mentioned the treatment of German physician and microbiologist, Robert Koch (1843-1910).

Koch is described by Laura Otis as the ‘discoverer of the tuberculosis and the cholera bacilli and an enthusiastic “microbe hunter” in Germany’s colonies’. In an article about Koch’s life and work, physician-writer Arthur Conan Doyle (1859-1930) claimed that Koch was an ‘all-round man of science, who had gained his laurels as an anatomist, but who had lightened and advanced views on many medical points’, in particular with his discovery of the ‘accursed comma-bacilli of cholera’. In the first of three references to Koch’s professional life, Ross describes how Koch’s work had gone unrecognised:

Yet sixteen years had elapsed since Robert Koch had discovered the cause of cholera. Unfortunately certain “eminent scientists” would not believe him, and one of these was the official investigator of the Indian Government. [...] During the sixteen years’ neglect of Koch’s discovery about eight million Indians had died of cholera. Doyle wrote of rumours that Koch had ‘aged years in the last six months, and that his lined face and dry yellow skin are direct results of the germ-laden atmosphere in which he so fearlessly lived’. According to Ross this suffering with its eventual triumph had gone unacknowledged. Ross’s bitter tone is made explicit with the use of quotations around the term ‘eminent scientists’. In Memoirs, Ross frequently references the enormous numbers of preventable deaths occurring simply because of the denial of scientific discoveries. Indeed, when suggesting death tolls due to the neglect of his malaria discovery he apologised to the reader: ‘(the reader is doubtless weary of hearing it!)’. Contemporaneous anecdotes of snubbed scientists enabled Ross to strengthen his own account of supposed exploitation and marginalisation. In his personal narrative, Ross broke away from accepted imagery utilised by the scientific elite, instead opting for seemingly contradictory imagery to further emphasise his disgust at his poor treatment.

41 Ross, Memoirs, p.185.
42 Doyle, p. 556.
43 Ross, Memoirs, p. 314-5.
Dismantling the Quest Narrative

In her discussion of Arthurian archetypes and motifs in the writings of fin-de-siècle parasitologists, Emilie Taylor Brown comments that:

The quest motif is one that characterised the parasitology narrative; [...] Manson’s use of this rhetoric in private correspondence, and McGregor’s glorification of the profession to medical students, suggests both a desire to sell the narrative to parasitologists (in addition to the general public) and an internalization of that narrative by its proponents. 44

It seems this quest motif is evident in the reproduction of a letter of encouragement in Ross’s Memoirs dated 21 June 1895. Manson wrote to Ross:

I look forward to receiving [Ross’s letters] with the greatest interest, and when a mail passed without getting one the other day, I was terribly disappointed for I thought you had […] given up the quest. Above all don’t give up. Look on it as a Holy Grail and yourself as Sir Galahad and never give up the search, for be assured you are on the right track.45

Manson’s extended metaphor encouraged Ross to imagine himself as a gallant knight and his scientific research as an epic journey culminating in the acquisition of precious treasure. It could be argued that by reprinting the correspondence between Ross and Manson, Ross encouraged the public’s internalization of the quest motif. However, allusions to an Arthurian archetype only appear once more in the autobiography. Two years into Ross’s malaria research, in 1897, he summarised a letter to Manson and wrote that ‘there was one method of solution, that of incessant trial and exclusion. But this meant enormous labour – and I had already spent two years over the quest’.46 Since this mention of a quest related to a reply from Manson, it may simply be an extension of Manson’s metaphor, rather than Ross’s way of characterising his narrative of scientific discovery.

Ross abandons Arthurian imagery in order to guard against the romanticisation of scientific research. Taylor Brown argues that ‘the adoption of this heroic persona by parasitologists in the use of Arthurian archetypes and metaphors […] served to romanticise

46 Ross, Memoirs, p. 211.
parasitology by grounding it in literary history'. The outcome of extensively using mythological tropes (romanticising scientific research), is why Ross would disregard such tropes in *Memoirs*. Taylor Brown further maintains that Arthurian tropes ‘performed multiple functions, including the legitimizing of western medical authority, the characterization of tropical medicine as a prerogative of the nation, and the encouraging of medical students to specialise in this form of training.’ In *Memoirs*, while Ross distances himself from the romanticisation of science bound up in the use of Arthurian tropes, he is able to perform similar rhetorical aspects by using imagery of war and piracy.

**Soldiers of Science**

Otis identifies the motif of war in the works of a multitude of Ross’s contemporaries. Robert Koch (1843-1910), Silas Weir Mitchell (1829-1914), Arthur Conan Doyle (1859-1930), and Santiago Ramón y Cajal (1852-1934) all utilise war imagery in their scientific writings, showing just how pervasive war imagery was for nineteenth-century physicians and scientific researchers. Otis points out that scientists were in fact replacing soldiers as national heroes:

> In 1907, introducing Koch at a scientific meeting, Andrew Carnegie reported that the French now named Pasteur as the greatest Frenchman who had ever lived; in the past it had been Napoleon. In the microbial age, scientists assumed the heroic role of soldiers, the creators and the defenders of empires.

As with contemporaneous scientific autobiographies, references pertaining to war are frequent in Ross’s description of his scientific research. Ross utilises this imagery when discussing the exploitation of the suffering scientist, in order that he might bring to light the battle towards scientific discovery, rather than simply providing ‘records of results’ or suggesting that he was lucky to have a ‘fortuitous scientific accident’.

During World War One, Ross was a consultant on malaria for the War Office. Both Ross’s younger brother, Charles, a member of the British Army, and Ross’s son, Campbell,

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49 Otis, p. 28.
a member of the Royal Scots, fought in World War One. Charles, a Major General, retired in 1915. Unfortunately, Ross’s nineteen-year-old son was ‘killed within the first few weeks of war on 26 August at Audencourt during the retreat from Mons. Initially he was posted “missing” and it was nearly two years before his family knew what had become of him’. Consequently, war imagery had great emotional resonance for Ross when writing Memoirs, and most likely also for his readership. Throughout his autobiography, Ross uses phrases such as ‘the Great Problem!’, ‘the last stage of the great battle’, ‘another great advance’, and ‘the Great Passion’ when discussing his research. This particular phrasing uses the connotations of the word ‘great’ to parallel Ross’s research to The Great War, implicitly demonstrating Ross’s position as a soldier on the battlefield fighting for medical science. When Ross and Grassi publicly fought over scientific priority of the discovery of the malarial parasite, Ross comments that he ‘determined to carry the war into the enemy’s county, and a short article by [him] in Italian […] appeared in the Policlinico of Rome’. Later Ross explains to the lay reader that: ‘[t]he Italian affair was only the beginning of a long series of attacks – from which all sanitary workers seem fated to suffer’. This motif of war presents the image of Ross as a soldier of science, battling for priority against fellow scientists who aim to claim priority. In letters to Manson, Ross also uses war imagery, writing that he has ‘seized the final position, [but] […] not yet occupied it with [his] full forces’. War imagery highlights Ross’s self-construction as a national hero battling for the good of the British Empire against others powers who might steal the Empire’s possessions. In letters seeking money for Ross, Manson employs similar imagery.

In letters reprinted in Memoirs Manson lauds Ross as a national hero. On 27 July Manson sent Ross a copy of a letter that he had written to Sir Charles Crosthwaite, the man who ran the India Office in London at the time, suggesting that Ross’s scientific research

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52 Gibson and Nye, Ronald, p. 7.
53 Ross, Memoirs, p. 125, 291, 293, 413.
54 Ross, Memoirs, p. 411.
55 Ross, Memoirs, p. 413.
56 Ross, Memoirs, p. 297.
should be encouraged by the Indian Medical Service through the granting of special duty in order continue his work. Manson writes that Britain is lagging behind in terms of scientific advances, claiming that this is particularly apparent in the matter of tropical diseases in which we should in virtue of our exceptional opportunities, be facile princeps. But even in tropical diseases Frenchmen, Italians, Germans, Americans, and even Japanese are shooting ahead of us. [...] In this matter of malaria here is a chance for an Englishman to rehabilitate our national character and to point out to the rest of the world how to deal with the most important disease in the world – malaria.57

In this letter, Manson attempts to make Ross’s work appealing to the British Government and their colonial interests. Manson figures the advances of science as a war that the British are currently losing, despite the great advantage of having the largest Empire: he claims other countries are ‘shooting’ before the British. Manson urges that the British seek to retain their best soldier of science, Ross, since he is in pursuit of the ‘most important’ disease. Alan Bewell notes that ‘throughout the nineteenth century, “Asiatic” or “India” cholera competed with malaria as the “tropical disease” par excellence’: uncovering how these diseases spread and overcoming them would be a great advantage to the imperial cause.58 In a speech given by Secretary of State at the Colonial Office, Joseph Chamberlain (1836-1914), reprinted in Memoirs, Chamberlain declares that the man who discovers malarial transmission ‘will do more for the world, more for the British Empire, than the man who adds a new province to the wide dominions of the Queen.’59 Otis notes that ‘Doctors [...] became analogous to soldiers, defending the empire against its time enemies [parasites]’ and Ross gleefully accepts this honour by reprinting these excerpts in his autobiography.60 Ross’s construction by colleagues as a war-torn solider of science is a persona he is willing to embrace, as it emphasises his bravery and intelligence for defeating one of the most problematic diseases of the British Empire. This war imagery is also a form of rebellion against self-denial, as it

57 Ross, Memoirs, p. 217.
59 Ross, Memoirs, p. 434.
60 Otis, Membranes, p. 32.
emphasises the suffering of the scientific researcher. Another form of imagery that Ross employs throughout *Memoirs* is that of piracy: a form unique to this scientific autobiography.

**Treasure Island**

On the day of his Nobel-Prize-winning discovery, 20 August 1897, subsequently dubbed Mosquito Day, Ross writes that ‘the dissection [of the mosquito] was excellent, and I went carefully through the tissues […] searching every micron […] as one would search some vast ruined palace for a little hidden treasure’.  

Ross memorialises the most important day of his career with a treasure metaphor. He uses this term to highlight his meticulous nature, as well as the significance of his discovery. Piratical imagery appears a further six times in Ross’s *Memoirs*: he declares competing scientists ‘a gang of sordid adventurers’ or ‘pirates’ and claims that his text will “reconstruct the crime” in detail, in order to expose some of the artifices of piracy’.  

Bradley Deane’s research suggests that during Ross’s lifetime the meaning of piratical imagery changed and developed.

Deane identifies how children’s adventure stories about piracy developed from the mid- to late-Victorian period in relation to British imperial interests. In reference to Dickens’s ‘The Perils of Certain English Prisoners’ (1857), Deane notes that:

> Dickens represents pirates in so profound an opposition to English virtue that only aggressively Manichean distinctions can capture it. Other stories of the 1850s made a similar case, particularly those in the emerging group of respectable boys' novels, […] which use piracy as the test by which an inherently moral British boyhood could be confirmed.

Born just three days after the beginning of the Indian Mutiny, Ross has been described as a ‘mutiny baby’, and it appears that he internalised the notion of pirates symbolising a challenge to the British Empire. In 1889, the same year he finished his malaria research, Ross published his first novel *The Child of Ocean*. The novel, which appears as a text of

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British Imperial propaganda, opens by following a group of pirates as they attempt to steal cargo from a merchant ship, but mistakenly sink a missionary ship from which only an infant, the subsequently named ‘child of ocean’, survives. The infant is swept onto the pirate ship by a strong wave. The captain of the ship, Billy Hayes, sees this as an omen that he must now raise the child. After an unidentified amount of years the pirate ship is wrecked on the Andaman Islands, which only the ‘child of ocean’ survives. The child grows up alone, becoming a feral man. After an uncertain amount of time there is another shipwreck and a young woman, Leda Vanburgh, is lost on the island. Despite her initial disgust at the feral man, Leda grows fond of him, naming him John and attempting to educate him. Eventually, Leda is rescued by her family who promise to return for John. John is convinced that Leda has left forever, and so he kills himself because he cannot bare to be without her. This notion of piratical cruelty destroying virtuous members of the British Empire, witnessed in the opening chapters of Ross’s *The Child of Ocean*, is mimicked in Ross’s discussion of scientists attempting to claim priority of his work. Ross identifies competing scientists in the same way as Dickens imagines the mutineers and in the way Ross describes pirates in his debut novel: a threat to his identity as a national hero of the British Empire, and therefore as a threat to the British Empire itself.

Ross uses piratical imagery to highlight his suspicion of an imminent attack by competing scientists:

[M]y storm-tost [sic] treasure-bark had now safely crossed the wide solitary ocean and was approaching harbour; but it was soon to be surrounded […], and the pirates lay in the offing ready to board me at the proper moment!\(^65\)

Ross describes the scientific discovery, or ‘my […] treasure-bark’, emphasising his ownership of the findings. The reference to his journey of scientific research as a ‘storm-tost […] ocean’ makes prominent the danger and struggle as an integral part of the work. Claiming that other scientists are ‘pirates’ indicates their immorality and by suggesting that their actions to steal Ross’s glory were premeditated he further amplifies this notion. In

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another passage Ross feigns ignorance to stress his shock at the ‘pirates’ that attempted to
steal his scientific ‘treasure’:

I have so great a respect for [scientists] that I cannot conceive them capable of the
tolly of ever undertaking the gamble I was guilty of! I am sure that none of them
would ever have embarked on so vast and stormy a sea, would even have been the
Columbus of so wild an adventure, would ever have shown – I will not say the
patience, the passion and the poetry – but the madness required to find that
uncharted treasure island! 66

Ross’s resentful tone is made explicit here. He depicts himself as the Italian explorer
Christopher Columbus, a comparison he makes a further four times, and his scientific
discovery as a dangerous sea journey. Ross’s self-construction as a Columbus of science
insinuates his bravery while searching for the unknown, as well as his work relation to the
expansion of an empire. Ross uncovers the truth of ‘record of results’, unveiling the suffering
of the scientist by describing his research as a ‘gamble’, a ‘vast and stormy […] sea’, and a
‘wild […] adventure’. He uses the term ‘treasure island’ to refer to his discovery, extending
the metaphor of the explorer which is also evident in the final line of the quotation. The link to
Treasure Island (1883), a boy’s adventure novel written by Robert Louis Stevenson (1850-
1894), references science as a colonial enterprise. Julia Reid notes that: ‘Treasure Island
[…] [explores] bellicose imperialism and a ruthless creed of heroic manliness’. 67 Diana
Loxley further investigates this aggressive imperialism, commenting that: ‘The problem of
order and instability [in Treasure Island] is represented by the threat of lawlessness and
criminality internal to the system of European cultural identification, that is, issuing from
within its own ranks as opposed to the threat posed by a racial, territorial, or cultural
otherness from outside.’ 68 It seems little wonder then, that as scientist fighting to retain his
priority from within the scientific community, Ross would utilise imagery from Treasure
Island. Ross mentions other scientists’ ‘vocations’, placing religious connotations onto their
work, implying that scientists are going against the will of God by infringing on Ross’s work

67 Julia Reid, Robert Louis Stevenson, Science, and the Fin de Siècle (New York: Palgrave
68 Diana Loxley, Problematic Shores: The Literature of the Islands, (New York: Palgrave Macmillan,
1990), p. 132.
instead of following their own path.\textsuperscript{69} This quotation acts as a microcosm of the text, weaving multiple images together that can appear contradictory. The use of multiple literary devices depict Ross’s panicked struggle first to discover the malarial parasite in the mosquito and subsequently to defend his priority over the discovery: in this instance, each image works to demonstrate Ross struggling to gain knowledge and the fight to retain authority over that knowledge. Reviews of \textit{Memoirs} gave mixed judgements as to whether Ross was successful in securing his heroic archetype and therefore his right to further recognition and reward.

\textbf{Contemporaneous Reviews of Memoirs}

Leonard Woolf (1880-1969) writes in his review of \textit{Memoirs}: ‘Memoirs are to the critic […] what the microscope is to scientists like Sir Ronald Ross.’\textsuperscript{70} Reviews of Ross’s \textit{Memoirs} indicate that contemporaneous readers did observe Ross’s divergence from the standard narrative of scientific autobiography. The opinion of each reviewer as to whether they have been convinced that Ross suffered from a lack of recognition and reward evidences how affective Ross’s unique narrative was for a contemporary readership.

In the earliest review of \textit{Memoirs}, printed in \textit{The Scotsman}, reads: ‘the mosquito, although not placed exactly at the front of the stage, occupies the central and largest part’.\textsuperscript{71} This sly remark implies that it is in fact Ross who is placed centre stage, rather than his scientific discovery. The day of Ross’s accomplishment is diminutively described as a ‘fairy tale of science’, showing a lack of recognition of the striking imagery Ross utilises to bring to light the suffering that led to discovery. The review concludes by disagreeing with Ross’s plea for further recognition, noting: ‘That recognition and reward, if tardy in coming, have been wide and full, is attested by the list of “Honours and Awards” with which Sir Ronald Ross fills a page of his Appendix’.\textsuperscript{72} The reviewer appears to have misunderstood that it is not that Ross denies that rewards were bestowed upon him. In fact, Ross acknowledges his

\textsuperscript{69} Ross, \textit{Memoirs}, p. 227.
\textsuperscript{72} Anonymous, ‘The Malaria Problem’, p. 2.
Nobel Prize at the front of *Memoirs*, dedicating the text to the people of Sweden. Instead, it is that these rewards were not sufficient to allow him to continue his scientific research. Reviews from medical professionals solicited for their opinions appear less frequently than Ross might have liked.

The names of persons sent review copies of Ross's *Memoirs* are noted in the correspondence between Ross and his publisher, Murray. Ross’s request that particular celebrity-physicians pen reviews for *Memoirs* suggests that, while he produced a narrative that distances himself from the accepted persona of the self-sacrificing scientist, he still hoped for approval from his network of contemporaries. Ross names Dr Harvey Cushing (1869-1939) (well-known American neurosurgeon and biographer of Ross’s friend, Sir William Osler), Dr Howard Kelly (1858-1943) (notable gynaecologist and biographer of Dr Walter Reed), Surgeon-Colonel W. G. King (1851-1935) (prominent I.M.S surgeon mentioned in *Memoirs*), Dr Robert McNair Wilson (1882-1963) (anonymous medical correspondent for the *Times*, with whom Ross was acquainted), Dr Marie Phisalix (1861-1946) (one of the first women to be awarded the title of Doctor in France; a herpetologist, and biographer of Dr Charles Louis Alphonse Laveran). Clearly, Ross chose the individuals solicited for review for their medical prowess, as well as their familiarity with the genre of scientific biography and autobiography. The only individual solicited for which a review can be confirmed is Surgeon-Colonel W. G. King.

In the *NATURE* review, written by King, he states that it is a narrative ‘devoid of technicalities of relentless search for a scientific truth […]’, which, in entrancing interest, may compete with Sherlock Holmes’s efforts at his best’.73 By using this comparison, King explicitly aligns Ross with the world-renowned scientific detective character created by Ross’s good friend Doyle. According to Michael Saler ‘Holmes was the first character in modern literature to be widely treated as if he were real and his creator fictitious’.74

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particularly marks out the interwar period, during which Ross published *Memoirs*, as a period at which ‘an outpouring of articles in prominent magazines, and books from respectable publishers, […] treated Holmes and Watson as real individuals’.

Thus, King is capitalising on the surge of interest and affection for the character of Holmes. Further to this, the alignment of Ross and Holmes subtly links Ross’s work to the expansion of the British Empire because, as Otis notes:

> The new science of bacteriology in the 1880s was inseparable […] from the desire to conquer new territory since tropical diseases did far more to check the progress of Empire-builders than African or Asian natives ever could […]. Conan Doyle […], an enthusiastic supporter of the British Empire, brought to life the fantasy of a national immune system through his character Sherlock Holmes.

King then indicates that, since Ross’s agonising work to protect the Empire rivals that of the fictional Holmes in terms of importance to the British public, Ross should be just as well recognised and called on for help to protect the British Empire just as frequently as the fictional detective. King ends his review begging the question: ‘What has the nation, the Parliament of which voted 30,000 to Jenner in token of gratitude, done for this practical philanthropist?’

King then endorses Ross’s self-fashioning as disregarded martyr for science. King’s review of Ross’s *Memoirs* was not the only one to appear in *NATURE*; Ross’s nemesis, Grassi, used four pages of the journal to give his opinion on the work.

**Grassi Controversy**

Grassi was the primary victim of Ross’s use of piracy imagery in *Memoirs*. Ross presents Grassi to his readership as immoral, suggesting that he has so little talent that he survives by stealing the research of genuine scientists. Unsurprisingly, Grassi was disgusted at the way he had been portrayed in *Memoirs*. In an effort to remove *Memoirs* from bookshops, he sent a letter to Ross’s publisher claiming that *Memoirs* ‘gravely defamed’ him and suggesting

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75 Saler, p. 600.
77 King, p. 5.
that Murray ‘withdraw from trade the memoirs of Ronald Ross’. Murray passed the letter onto Ross with his own letter attached confirming that he would certainly not be removing the book from trade. He also sent a placating reply to Grassi explaining that he has no knowledge of parasitology and that he forwarded the letter to Ross. Ross responded to Murray that the best option was simply to ignore Grassi. There is no further evidence of correspondence in the archives. Perhaps because Ross refused to reply, Grassi decided to present his case to the public.

A year after the publication of *Memoirs* and Grassi’s initial letters of complaint, Grassi takes action by producing an article for *NATURE*, in which he remarks: ‘I cannot accept his opinions. […] I shall limit myself to a statement of the facts, without heeding the language in which I have been vilified, and carefully avoiding personalities.’ Juxtaposing Ross’s ‘opinions’ with his own ‘facts’, Grassi promises to do what Ross did not: to provide ‘records of results’ in order to uphold the accepted narrative of scientific research. However, Grassi does not only state facts, instead utilising Holmesian imagery to convince the reader of his priority. Grassi describes his method of discovering the type of mosquito that transmits malaria as follows:

> [I]f in a village of a thousand inhabitants a theft has been committed, it will be very difficult to discover the thief, unless it is first established, by appropriate investigations, which persons fall under suspicion. Once in possession of the list of suspects, it is much easier to find the culprit, as every detective knows full well.

Grassi asserts himself as the detective, rather than the thief he is accused of being in *Memoirs*. He emphasises his careful consideration of mosquito ‘suspects’ and implores the reader to understand that these methods are something that every person of that profession should do. Grassi juxtaposes this metaphor with his description of Ross ‘examining every

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blood-sucking insect he could lay his hands upon, and trying to cultivate malarial parasites in it.\footnote{Grassi, ‘The Transmission of Human Malaria’, p. 304.} Essentially, Grassi suggests that Ross was an unfit scientist and that, as a result, he conducted haphazard and careless research, the implication from this quotation being that Ross was simply extraordinarily lucky to have made the discovery at all. The main body of the article briefly describes Grassi’s research, placing Ross in the position of the thief by quoting one of Manson’s letters found in \textit{Memoirs}: ‘I hear Koch has failed with the mosquito in Italy so you have time to grab the discovery for England’.\footnote{Ross, \textit{Memoirs}, p. 334.} Grassi concludes:

\begin{quote}
The “\textit{Memoirs}” of Ross contain many other inexactitudes concerning myself and my Italian colleagues, but I believe that the passages I have already noted will suffice to enlighten any impartial reader. At any rate, I am always ready to answer frankly every other charge.\footnote{Grassi, ‘The Transmission of Human Malaria’, p. 307.}
\end{quote}

Grassi believes he has been mistakenly charged with a crime of piracy that he did not commit, using four pages to counteract Ross’s 547 page-long \textit{Memoirs}. Ross replies to Grassi’s contestation with two short paragraphs the following week.

Ross’s short rebuttal to Grassi’s argument is primarily a list of eminent scientists who agree with Ross’s claim to priority and a list of recognition for his malarial research. Ross argues that the ‘competent men of science who have studied the matter’ are the only individuals capable of reaching a conclusion on priority.\footnote{Ronald Ross, ‘The Transmission of Human Malaria’ \textit{NATURE}, 8 March 1924, p. 353.} He then identifies these men, explaining that in \textit{Memoirs} he has ‘quoted the opinions of Lord Lister, Sir Patrick Manson, Dr Laveran, Prof. Robert Koch, Dr J. Mannaberg, Dr. E. Ulmquist, and Prof. Dr. Galli-Valerio’.\footnote{Ross, ‘The Transmission of Human Malaria’, p. 353.} In the next and penultimate sentence of the article, Ross writes that in ‘May 1901, dr. G. H. F. Nuttal published a critical analysis of the question of priority; in 1902 the Nobel Committee of Stockholm decided in my favour; and in the last January number of \textit{Discovery}, Sir Arthur Shipley has now summed up the position.’\footnote{Ross, ‘The Transmission of Human Malaria’, p. 353.} In these lengthy lists, Ross is simply reiterating what he was already able to evidence in \textit{Memoirs}. Despite Ross’s concluding line that he
‘cannot afford to spend any more time discussing it’, Grassi responds two weeks later by borrowing Ross’s technique of listing, providing names of people who hold ‘favourable opinions [of Grassi’s work] which are no less authoritative’. Ross did not reply to Grassi’s article and, since Grassi died the following year, Ross won the twenty-six year battle for priority.

**Conclusion**

Charon suggests that autobiographies are an opportunity to tell the self. However, as evidenced in autobiographies of contemporaneous scientists, and Ross’s anecdotes of the forgotten suffering scientist throughout *Memoirs*, scientists often sought to exile the self entirely. Ross exposes this denial of the self as the reason scientists go unrecognised and unrewarded for painstaking scientific research conducted to aid humanity. *Memoirs* provided Ross with the opportunity to reflect on his time striving for knowledge to the detriment of his passions and well-being. This reflection allows Ross to infuse a more conventional scientific narrative with a telling of the self, so that he might uncover the exploitation of the forgotten suffering scientist. Ross rebels against the established narrative of the scientific researcher through a melange of war and piracy imagery. Imagery of the First World War held emotional resonance for Ross, a war in which he experienced personal loss, and so it enabled him to reveal the struggle of the suffering scientist to a public who had also witnessed the horrors of the Great War. Piratical imagery aligned Ross’s narrative with that of a national hero battling against piracy for the good of the British Empire. Ross fashions himself as a pioneer of scientific research, a hero of the British Empire and a figure worthy of religious-like adoration by the public, as well as a pioneer of the rights and recognitions of the scientific researcher. By reintroducing the self to this narrative of scientific discovery, Ross demonstrates to the public all scientists’ absolute need for acknowledgement and rewards.

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