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Miasmas, Mosquitoes, and Microscopes:  
Parasitology and the British Literary  
Imagination, 1885-1935

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## Declaration

A version of the second chapter won the BSLs/JLS essay prize in 2014 and was featured in the *Journal of Literature and Science*. I declare that this thesis is my own work and has not previously been submitted for a degree at another institution.

## Abstract

This thesis explores the complex and multi-form exchanges between parasitology and the British literary imagination in the period 1885 to 1935. This fifty-year period, which takes the institutionalisation of parasitology as its mid-point, was a significant cultural moment, witnessing the diversification of medicine into research specialisms. In the case of parasitology, this increasing specialisation was accompanied, seemingly paradoxically, by what we would now call interdisciplinarity. Parasitologists consciously engaged with literary myths of nationhood in order to garner widespread support for their sub-field, and help communicate their research. Meanwhile they provided the public with significant motifs for exploring a variety of social, cultural, and political relationships. Literary authors' engagement with disciplinary politics provided them with a means of interrogating British national identity and critiquing or supporting British imperial rule. The dialogues between parasitology and the British literary imagination in this period ultimately articulated anxieties concerning "self" and "other" at the biological, psychological, and ideological levels. As I will argue, the parasite-host relationship became a significant framework for understanding identity, and consequently was deeply embedded in, and inseparable from, understandings of what it meant to be British in an increasingly global world.

In order to access the dialogues between parasitology and the British literary imagination, I will use a variety of sources, including: literary fiction, poetry, satire, newspaper articles, personal correspondence between doctors, parasitologists' research diaries, and scientific publications. In analysing this dialogue, which might be taken as a case study of wider literature-science relationships in this time period, we gain a greater understanding of the politics of narrating science. Building on previous work in the burgeoning field of literature and science studies, this thesis will seek to explore the utility of interdisciplinary approaches to research and communication, investigate the processes behind the public understanding of science, and interrogate the cultural and historical framing of science.

## Glossary of Terms

**Ankylostome** (*Ankylostoma duodenale*): a parasitic nematode worm, which causes Hookworm disease. The larvae are found in the soil and can be transmitted by drinking contaminated water, eating unwashed food, or by their direct penetration of the skin (especially the feet).

**Ankylostomiasis:** see ankylostome.

**Ascaris** (*Ascaris lumbricoides*, also ascarides): a nematode causing the parasitic disease ascariasis. When in large numbers these worms can cause: fever, abdominal pain and swelling, diarrhoea, and shortness of breath. Transmitted by eating food or drinking water contaminated with *Ascaris* eggs.

**Ascariasis:** see ascaris.

**Dermazoan:** a parasitic organism of the skin, adj. dermazoic.

**Dracunculiasis** (or guinea worm disease): a parasitic disease caused by the nematode worm *Dracunculus medinensis*. From the Latin meaning 'affliction with little dragons', the name dracunculiasis was seen as a fitting description for the burning sensation caused by the worm as it burrows through the subcutaneous tissue.

**Ectozoan:** an external parasitic organism such as a leech or a flea, adj. ectozoic. Also: ectozoon, epizoan.

**Entozoan:** a parasitic organism that lives within the body of the host, especially intestinal worms, adj. entozoic. Also: entozoon, endozoan.

**Erythrocyte:** a red blood cell.

**Filaria** (filarial worms): nematode worms belonging to the super-family filarioidea, and cause the parasitic disease filariasis, transmitted by black flies and mosquitoes. When these worms infest the lymphatic system they cause Lymphatic filariasis or Elephantiasis, which is caused by *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*, and transmitted by mosquitoes. Elephantiasis can result in thickening of skin and the swelling of arms, legs, and genitals.

***Filaria perstans*:** a nematode worm that Patrick Manson proposed as the cause of sleeping sickness in the 1890s, since disproven, now *Mansonella perstans*, a cause of filariasis.

**Flagella:** a whip-like organelle of some single-celled organisms, which aids in locomotion and sensory processing. Parasitologists in this time period seem to use pseudopodia and flagella interchangeably. See pseudopodia.

**Haematozoan:** a parasitic organism of the blood, adj. haematozoic.

**Helminth:** a general name for parasitic worms, comprising three groups: cestodes (tapeworms), nematodes (roundworms), and trematodes (flukes). Throughout the seventeenth to nineteenth centuries, helminth was often used to describe any parasite morphologically similar to a worm, and sometimes even to refer to ecto-parasites such as leeches.

**Hookworm disease:** a parasitic infestation, which can cause: rash, abdominal pain, anaemia, respiratory problems, diarrhoea, and weight loss. See ankylostome.

**Kala-Azar** (or Visceral Leishmaniasis; also: black fever and dum dum fever): a parasitic disease caused by the protozoan parasite *Leishmania spp.* and transmitted by sand flies. Symptoms include: fever, weight loss, anaemia, fatigue,



enlargement of spleen and liver, and occasional blackening of the skin. Post Kala-Azar dermal leishmaniasis, a secondary form of the disease, may follow recovery, leaving hosts with skin lesions resembling leprosy. If left untreated, the mortality rate is close to 100%. It is the second largest parasitic killer in the world, after malaria.

**Vector:** a carrier that transmits a pathogen from one host to another. Vectors are often haematophagous (blood-sucking) invertebrate animals such as the mosquito, which transmits malaria and filariasis, or the tsetse fly, which transmits sleeping sickness.

**Trichinosis** (or Trichiniasis): a parasitic disease caused by a nematode worm, *Trichinella spiralis*. Humans can become infected by eating undercooked pork.

***Filaria sanguinis hominis*:** see filarial.

**Nematode:** see helminth.

**Phagocyte:** a white blood cell that has the ability to ingest, and digest, foreign material.

**Plasmodium:** a genus of parasitic protozoa, which are the causative agents of malaria, transmitted by the *Anopheles* mosquito. Five species cause malaria in humans: *P. vivax*, *P. ovale*, *P. malariae*, *P. knowlesi*, and *P. falciparum*. The latter, causing a form of malaria also known as cerebral malaria, produces the most severe symptoms.

**Protozoan:** a single-celled microorganism. Protozoans referenced in this thesis are almost exclusively parasitic species.

**Pseudopodia:** a temporary appendage, which aids in locomotion, sensory processing, and ingestion of nutrients. Parasitologists in this time period seem to

use pseudopodia and flagella interchangeably. See flagella.

**Trichnocephalus** (*Trichuris trichiura*): a nematode worm that causes the parasitic disease trichuriasis.

**Trypanosome** (*Trypanosoma spp.*): a genus of parasitic protozoa, which are the causative agents of Human African Trypanosomiasis (or sleeping sickness), Chagas' disease, and the animal trypanosomal diseases: nagana and surra. References to trypanosomes or trypanosomiasis in this thesis refer to Human African Trypanosomiasis, which is caused by *T. brucei gambiense* and *T. brucei rhodesiense* and transmitted by tsetse flies. Symptoms include: fever, headaches, itchiness, swollen lymph nodes and joint pain, followed by neurological problems (such as confusion, poor co-ordination, muscle weakness, Parkinson-like tremors, speech disorders and paralysis), sleep disruption, coma, and organ failure. If untreated *T. b. rhodesiense* will cause death within months, *T. b. gambiense* within several years.

**Trypanosomiasis:** a parasitic disease, see trypanosome

## Introduction

The fashion of the day would fasten the blight of the Indian caste upon us; would make us either literary men or scientific men, either business men or professional men, either thinkers or tailors [...] but the duty of the spirit [is] to explore every direction, if only to learn the limits of things [...] I say, not art for art's sake or science for the sake of science, but both for humanity.<sup>1</sup>

In 1908, Professor George H. F. Nuttal F.R.S. founded *Parasitology*, the first British journal dedicated to the study and treatment of parasitic disease. As a supplement to the *Journal of Hygiene*, it drew together strands of protozoology, helminthology, and entomology to form a new discipline. This new discipline emerged from a contested and competitive adolescence in the late nineteenth century into a fully-fledged member of the medical 'family' in the early twentieth, following the establishment of the Liverpool and London Schools of Tropical Medicine in 1898 and 1899 respectively. Despite being a product of the increasing specialisation of disciplinary study at the turn of the century, parasitology was a field intensely aware of the benefits of interdisciplinarity. As

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<sup>1</sup> London, London School of Hygiene and Tropical Medicine. [hereafter: LSHTM] The Ross Collection. [hereafter: RC] Ross/131/14/20. 'Science and Poetry'. MS of lecture delivered at the Royal Institution, 4 June 1920.

Nobel Prize winning parasitologist Ronald Ross argued in the extract of his lecture with which I started, science and art share a common interest: humanity. The social preoccupation of these disciplines positions them, Ross argues, in a symbiotic relationship. In this thesis, I will analyse this symbiosis in the period 1885-1935, a fifty-year epoch with the formalisation of parasitology at its midpoint. This will enable me to explore the factors that precipitated its institutionalisation, as well as the consequences of this phenomenon. My choice of the word 'symbiosis' is significant. From the Greek, meaning 'living together', symbiosis commonly refers to an intimate association between two or more different organisms.<sup>2</sup> Subdivided into parasitic and mutualistic relationships, symbiosis refers to the relationships that form the basis of parasitology, and metaphorically, as I will argue, the relationship between art and science. I have chosen the British literary imagination as a broad term that enables me to explore the many entanglements of this medical speciality with what might loosely be termed 'art', including novels, poetry, plays, illustrations, and myths. By electing to focus on this time period, I am able to analyse both the ideas that led to the discipline's formal recognition, as well as the lasting impact of its institutionalisation on the literary imagination.

As I will argue, parasitology—formally and informally—provided the literary imagination with significant images, metaphors, and frameworks, forming part of many bidirectional exchanges, which contributed to the cultural understanding of selfhood. The direct influence of parasitology on the British literary imagination might be read in literary authors' interaction with not just

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<sup>2</sup> 'Symbiosis, n.' *Oxford English Dictionary* (Oxford: Oxford University Press, 1919) <<http://www.oed.com/view/Entry/196194>> [accessed 20 March 2016].

disciplinary science, but disciplinary politics.<sup>3</sup> The influence of the literary imagination on parasitology is most apparent in parasitologists' use of literary tropes when speaking about their discipline. The imaginative symbiosis between science and art in this instance is underscored by conversations about Britain and her global power structures. Parasitologists drew on literary myths of nationhood to legitimise their field, and strengthen the political and imaginative associations between their father discipline—Tropical Medicine—and British Imperialism. At the same time, authors penned stories concerning parasitic disease that worked to support, promote, or challenge these associations, and in the process revealed underlying cultural anxieties related to national and individual identity. These exchanges between parasitology and the British literary imagination articulated anxieties concerning the concept of 'self' and 'other' at biological, psychological, and ideological levels. In this thesis I will explore this dialogue as one mediated by understandings of British nationhood and personhood and examine the impact that the diversification of medicine into research specialisms had on the public's engagement with science, and the extent to which this relied on the pairing of scientific authority and national pride. I will use a wide variety of sources to demonstrate these discourses, including: popular fiction, poetry, scientific publications, newspaper articles and advertisements, as well as personal and professional correspondence.

At the turn of the nineteenth into the twentieth century, parasites became protagonists in scientific narratives, plot devices in fiction, syllabic puns in satirical poetry, and poster children for British Imperialism. Parasitologists

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<sup>3</sup> See Appendix 1 for a timeline illustrating key research and discoveries in parasitology alongside the publication dates of the fiction analysed in this thesis.

were, by necessity, also microscopists, haematologists, physicians, explorers, sanitation officers, and sociologists. Their work was medical, empirical, mathematical, political, and communicative, and so the discourses surrounding parasitology and its proponents were complex and diverse. I believe that their interactions with literary culture tell us much about the way we narrativise science. By analysing the ways in which authors use the politics of parasitology as a framework for discussing imperialism, I will also highlight the utility of science in mediating our understanding of the social world. This thesis will be particularly concerned with human internal parasites—helminthic and protozoan—the diseases they cause, and their interactions with understandings of the British imperial project.

Although discussing the parasitologist more broadly as a professional figure in this period, I will focus primarily on Sir Ronald Ross, the first British man to win a Nobel prize, discoverer of the mosquito transmission of malaria, and a hugely influential figure in the historicising of the discipline.<sup>4</sup> Dubbed 'one of the greatest benefactors of the human race',<sup>5</sup> with an entry that filled thirty lines in the 1920 edition of *Who's Who* (as noted by the *Yorkshire Evening News*), Ross had a long list of accolades to his name.<sup>6</sup> He wrote a petition to parliament in 1913, which began: 'The humble petition of ~~Major Sir~~ Ronald Ross, Knight Commander of Bath, Major of the Indian Medical Service ~~Retired~~, Officer of the

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<sup>4</sup> Ross wrote several histories of the mosquito-malaria discovery, which charted the theory from Ancient Greece up until his and Grassi's experimental proof at the end of the nineteenth century. The scope of this project provided Ross with an authoritative and seemingly neutral voice, however enabled him to frame the research in ways that benefitted his professional image and bolstered his own role in the theory's acceptance.

<sup>5</sup> W. G. M, 'Science and Poetry, Work of Sir Ronald Ross' *West Australian* Saturday, 13 February 1932, p.5.

<sup>6</sup> London, LSHTM, RC. Ross/132/46-57. Clipping: 'Sir Ronald Ross' *Yorkshire Evening News*, 4 March 1920.

Order of Leopold II of Belgium, Fellow and Royal Medallist of the Royal Society, Nobel Laureate, Member and Honorary Fellow of the Royal College of Surgeons London,' and continued for the rest of the page, ending in a rather meaningful 'etc.'<sup>7</sup> This self-penned introduction showcases his official and scientific achievements (as well as his vanity), but says little of his public reputation as 'a mathematician of high ability, a poet whose poetry won the unstinted praise of John Masefield, a novelist of distinction, and a scientific investigator of the highest rank.'<sup>8</sup> This endorsement by Scottish-born politician and editor, Wallace Nelson, partly reflects the fame Ross garnered after winning his Nobel Prize in 1902 and during his subsequent public engagement activities; however, more significantly, it reflects the later narrativisation of the discovery of malaria's mosquito vector by Ross and his colleagues.

In his 2007 study *Tropical Medicine: An Illustrated History of the Pioneers*, Gordon C. Cook claims that 'tropical medicine was [...] an integral part of Joseph Chamberlain's plan for 'constructive imperialism'' and that it would therefore be 'accurate [...] to envisage colonial politics as exploiting a newly established discipline for its own ends.'<sup>9</sup> Michael Worboys upholds a similar opinion in his essay on the emergence of tropical medicine, recounting the ways in which research about tropical diseases directly facilitated colonial expansion.<sup>10</sup> John

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<sup>7</sup> London, LSHTM. RC. Ross/121/02/11. Petition to Parliament. This was later shortened to: 'Ronald Ross, Knight Commander of Bath, Major of the Indian Medical Service, Retired, Fellow of the Royal College of Surgeons of England'.

<sup>8</sup> Wallace Nelson, 'Sir Ronald Ross. An Appreciation' *The Sydney Morning Herald*, Tuesday 20 September 1932, p.8.

<sup>9</sup> Gordon C. Cook, 'Origins of the Formal Discipline: Background Factors' *Tropical Medicine: An Illustrated History of the Pioneers* (Massachusetts: Academic Press, 2007) p.34.

<sup>10</sup> Michael Worboys, 'The Emergence of Tropical Medicine: A Study in the Establishment of a Scientific Specialism' in *Perspectives on the Emergence of Scientific Disciplines* eds. Gerard

Farley goes as far as to claim that tropical medicine was so imperial in its concerns, discourses, and implementation that rather than a medical specialty it became 'a branch of political imperialism'.<sup>11</sup> This process was reciprocal: many historians, including Worboys, point out that father of tropical medicine, Patrick Manson, also exploited Chamberlain's imperial vision to further his own ideas about the discipline, suggesting that while tropical medicine provided a legitimising narrative for British colonial dominance, Britain's own imperial project, at the same time, provided authority for this emerging specialty. In this thesis I will analyse this reciprocal exploitation, presenting, particularly in Chapter Two, a case for the adoption of imperial discourses by parasitologists as an attempt to sanction their field of study. As well as the practical and political structures that imperialism provided, I argue that parasitologists recognised the imaginative powers of an ideology so concerned with national identity. Not only did parasitologists capitalise on the imperial relations of the discipline to garner financial and political support, they also consciously strengthened this association by framing their research within British myths of nationhood. By invoking literary archetypes such as the Arthurian knight, and envisaging their research within a quest narrative, parasitologists romanticised their profession and used imperial politics to reinforce the association between scientific and national greatness.

Ross was one of the most prolific narrators of parasitology; in 1923, he published his memoirs, which professed to give an account of 'the great malaria

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Lemaine, Roy McLeod, Michael Mulkay, and Peter Weingart. (Chicago: Aldine Publishing, 1976) pp.75-98.

<sup>11</sup> John Farley, *Bilharzia: A History of Imperial Tropical Medicine* (Cambridge: Cambridge University Press, 1991) p.293.



problem and its solution'.<sup>12</sup> By interleaving his experimental observations with his own poetry, Ross produced a romanticised version of the history of his discovery, which prioritised the emotional narratives of science and their public perception. He published an anthology of his poetry in 1911, together with a textbook on malaria, conceiving of the two works as complementary. The anthology contained his most famous 'malaria day' poem, composed shortly after his mosquito-malaria discovery and published widely in the national press.<sup>13</sup> He subsequently gained fame as something of a polymath, was close friends with writers like Arthur Conan Doyle, H. Rider Haggard, H. G. Wells, and John Masefield, and was even appointed President of the British Poetry Society during the First World War. English writer Rudolphe Louis Megroz described Ross's rise to prominence in distinctly romantic terms: 'after heroic and solitary labours, [he] earned undying fame as a medical scientist, [but he] had begun as a poet and remained essentially a poet.'<sup>14</sup> This appraisal supports the narrative advanced by Ross and his colleagues in the 1890s of the lone scientific investigator risking his life and giving his labour for the good of humanity. The

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<sup>12</sup> See: Ronald Ross, *Memoirs; with an Account of the Great Malaria Problem and its Solution*. (London: John Murray, 1923).

<sup>13</sup> See e.g. 'Ronald Ross' *Birmingham Daily Post*, Monday 20 August 1917, p.4.  
'Malaria Secret in Verse' *Sunderland Daily Echo and Shipping Gazette*, Wednesday 13 May 1931, p.9.  
'Saviour of a Million' *Hartlepool Northern Daily Mail*, Wednesday 13 May 1931, p.4.  
'Conqueror of Malaria' *Dundee Evening Telegraph*, Wednesday 13 May 1931, p.6.  
'Saved a Million Lives' *Gloucester Citizen*, Wednesday 13 May 1931, p.12.  
'Saviour of a Million Lives' *Lancashire Evening Post*, Wednesday 13 May 1931, p.4.  
'Sir R. Ross's Birthday' *Aberdeen Journal*, Thursday 14 May 1931, p.6.  
'Celebrated in Poetry' *Gloucester Journal*, Saturday 16 May 1931, p.16.  
'Sir Ronald Ross Dead' *Dundee Courier*, Saturday 17 September 1932, p.5.  
'Sir Ronald Ross' *Western Morning News*, Saturday 17 September 1932, p.7.  
'Mosquito Day and the Man Who Conquered Malaria' *Yorkshire Evening Post*, Saturday 17 August 1940, p.4.

<sup>14</sup> R. L. Megroz, 'Sir Ronald Ross as Fiction Writer' *The Bookman* 79(1930)469 pp.14-16 (p.14). Indeed, when discussing Ross's birthday, the *Gloucester Journal* chose to entitle the article 'Poet Who Conquered Malaria'. 'Poet Who Conquered Malaria' *Gloucester Journal*, Saturday 16 May 1931, p.16.

public's perception of Ross as 'essentially a poet'—propagated by his autobiography and literary reviews of his poems and novels—strengthened his position as a figurehead who could engage the public. Ross's literary self-fashioning worked in dialogue with press coverage to contribute to the historicising of parasitology, and to the imaginative rewriting of the malaria-mosquito discovery as a struggle of British national identity over an adversarial Nature.

The narration of the 'conflict' between the parasite and the parasitologist drew much from, and was reinforced by, the literary archetypes of the imperial adventurer and the detective. I will establish this imaginative dialogue through close readings of fiction, including Arthur Conan Doyle's Sherlock Holmes stories and R. Austen Freeman's Thorndyke mysteries, as well as adventure romance from John Masefield, Henry Seton Merriman, and Joseph Hocking.<sup>15</sup> The discourses surrounding parasitic disease were informed by narratives of racial and moral fitness, and ultimately by understandings of 'tropicality'. In his introduction to the 22<sup>nd</sup> edition of Patrick Manson's seminal 1898 textbook, *Tropical Diseases*, Gordon Cook recognises a politico-ideological treatment of illness inherent in the terminology 'tropical medicine', rather than 'medicine in the tropics'. Tropical medicine, he argues, emerged against a backdrop of varied, but preeminent disciplines, including 'public health (and hygiene); travel and exploration; natural history; evolutionary theory; and the precise knowledge of

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<sup>15</sup> Within this thesis I define adventure romance as texts that include a British protagonist who ventures into colonial space and a love interest that, to a greater or lesser extent, drives the plot.

the causation of disease (germ theory).<sup>16</sup> He asserts that clinical parasitology was 'superimposed' over the top of these founding disciplines to create tropical medicine—a statement that recognises the prominence of parasitology as a framework for the study of tropical diseases. This framework encouraged researchers to understand tropical diseases as chiefly parasitic diseases, which were then situated in dialogue with discourses concerning sanitation, geography, co-adaptation, and transmission strategy. These diseases were always inflected by the ideologue 'tropical', which was, for many, indicative of more than simply climate.

Despite Manson's obvious discomfort in using the term, which he admits, 'is more convenient than accurate',<sup>17</sup> he appears to recognise the cultural cachet in titling his textbook *Tropical Diseases*, which worked to erect boundaries between these diseases and their European brethren. Although not covering all diseases that occur in warm climates, or indeed dealing exclusively with diseases that *only* occur in warm climates, Manson upheld his use of 'tropical' as a meteorological signifier for diseases that are solely or especially prevalent in certain regions. He used 'climate', not because he believed it to be a disease agent in and of itself, but because he wanted to highlight the role of high temperatures, which generally supported the proliferation of parasites and their vectors and so enabled the actual disease agents to flourish. Thus the tying of the signifiers 'tropical' (referring to the climatic region) and 'parasitic' (referring to the mode of transmission) resulted in the association of these diseases with

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<sup>16</sup> I would also add: helminthology, entomology, and protozoology to this list. Gordon C. Cook, 'History of Tropical Medicine, and Medicine in the Tropics' in *Manson's Tropical Diseases* eds. Gordon C. Cook and Alimuddin I. Zumla (London, Elsevier, 2009) pp.1-8. (p.1).

<sup>17</sup> Patrick Manson, *Tropical Diseases: A Manual of the Diseases of Warm Climates* (London: Cassell, 1900) p.xv.

geographically specific flora and fauna. In this thesis I will use the terms 'tropical medicine' and 'parasitology' to refer broadly to the same discourse, recognising that parasitology was a sub-discipline that is often inseparable from its broader parent discipline. Indeed, although tropical medicine included both tropical bacteriology and tropical parasitology, parasitologists did their best to stake exclusive claims over the term. Regardless, the discourses surrounding parasitology were underpinned by their relationship to the tropical world.

Despite Manson's careful treatment of the tropical as a strictly natural phenomenon, he couldn't resist locating what he called 'cosmopolitan' diseases like leprosy and plague in the tropics, not because they depend on tropical climate, but because they thrive there due to the 'backward social and insanitary conditions [...] which are more or less an indirect outcome of tropical climate'.<sup>18</sup> Thus he connects the natural or climatically tropical environment with an artificial idea of the tropics as unhygienic and socially backwards—a connection that confirms David Arnold's argument for the historical emergence of the tropics as a conceptual, as well as physical space.<sup>19</sup> Arnold explores 'tropicality' as a western cultural construction in dialogue with Edward Said's 'Orientalism', both being, for Arnold, relationships of power. Felix Driver and Luciana Martins argue that both concepts have been used to conceive of the essential differences between natures and cultures, understood in markedly spatial terms,<sup>20</sup> an observation that is supported and nuanced by Manson's view of climate (nature)

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<sup>18</sup> Manson, *Tropical Diseases*, p.xx.

<sup>19</sup> David Arnold, "'Illusory Riches": Representations of the Tropical World, 1840-1950' *Singapore Journal of Tropical Geography* 21(2000)1 pp.6-18.

<sup>20</sup> Felix Driver and Luciana Martins, 'Views and Visions of the Tropical World' in *Tropical Visions in an Age of Empire* eds. Felix Driver and Luciana Martins (Chicago: The University of Chicago Press, 2005) pp.3-22. (pp.4-5).

as indirectly influencing social structures and behaviours (culture). This is certainly upheld by literary fiction in the period I will consider, which troublingly associates tropical illness with immoral behaviour. The framing of leprosy as a tropical phenomenon will be particularly significant in relation to my analysis of Conan Doyle's 'The Adventure of the Blanched Soldier'.

Edward Said contends that the relationship between the Orient—the 'East'—and the Occident—the 'West'—was a relationship of power, whereby the East was 'Orientalised' partly because it 'submitted to being made Oriental'.<sup>21</sup> This same process helped structure the tropical world; the realities of imperialism facilitated an all but unchallenged European discourse about the tropics. In this thesis, I am particularly interested in one aspect of 'tropicality'—disease—and its interrelations with other signifiers of the tropical world. The power relationship that unpinned the 'submission' of the tropics to being 'made tropical' is particularly apparent in the advent of tropical medicine, which might more appropriately be called 'imperial' medicine. Decisions to include, exclude, or frame in certain ways diseases occurring in the colonies contributed to the construction of the tropics as spaces of 'disease and savagery', as Lesley Wylie argues in her chapter on tropical nature and landscape aesthetics.<sup>22</sup> This 'tropicalisation' was carried out almost exclusively by Western practitioners, who may or may not have been working in these spaces and thus it became a discourse *of* the metropole *about* the periphery, intensified by the relative novelty of these diseases to their Western descriptors and readers. I will explore

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<sup>21</sup> Edward Said, *Orientalism* (1978; London: Penguin Books, 2003) pp.4-6.

<sup>22</sup> Lesley Wylie, *Colonial Tropes and Postcolonial Tricks: Rewriting the Tropics in the Novella de la Salva* (Liverpool: Liverpool University Press, 2009) p.40.

this discourse by analysing specifically British fiction written about tropical spaces, and largely British parasitologists writing about tropical disease.

Arnold argues that in Western depictions of tropical spaces, a paradox was born out of the simultaneous perception of the tropics as landscapes of natural abundance and fertility, and of disease and poverty: 'Europe's engagement with the tropics contained, almost from the outset, a duality that made the tropics appear as much pestilential as paradisiacal.'<sup>23</sup> He identifies the propensity for early accounts to exaggerate the abundance of the tropical landscape and to homogenise its assets, leading to a disparity between expectation and reality for tropical explorers. The tropics, demarcated by their geographical proximity to the equator, and encompassing parts of North, Central, and South America; the Caribbean; Africa; India; South East Asia, and parts of Australia, were, despite their diversity, generalised, with the 'hot, wet lowlands' most often taken as typifying the tropical world as a whole (9). This identified the tropics both geographically and topographically as humid and marshy—a demarcation overwhelmingly associated with the propagation of disease, particularly malaria, owing to the belief that such diseases were spread by miasma. This belief persisted in the lay mind for years after the true aetiology of malaria was elucidated, as Ronald Ross laments in 1902:

The superstition that the disease [malaria] is due to a poisonous exhalation from the soil, or to a miasma rising from marshes has obtained, during several centuries, such a grip on the public mind, that it

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<sup>23</sup> Arnold, "Illusory Riches", p.8.

is not likely to disappear for many years; and people will long dread the harmless smell of turned earth, or point with fear to the innocent evening mist, or close their windows against the cool evening breeze.<sup>24</sup>

The erroneous understanding of the tropics as predominantly comprising these stigmatised landscapes contributed to the widespread understanding of the tropics as pathological. Notwithstanding this descriptive and conceptual homogeneity, as parasitology research penetrated the public sphere in the 1890s it had a marked impact on British fiction about the tropics, which began to forward more nuanced understandings of these spaces. This is recognisable in Henry Seton Merriman's assertion in *With Edged Tools* (1894) that India is home to 'fatalism' and Africa to 'irritability'.<sup>25</sup> As I will argue, these conceptual nuances are nuances of pathology—'fatalism' and 'irritability' here standing in for the specific tropical diseases that are most associated with these regions: malaria and African sleeping sickness respectively. Merriman's comparison is particularly significant, owing to the frequent juxtaposition of India and Africa in late-nineteenth century medical discourse: 'It seems reasonable to expect that Sierra Leone will in the near future be made as habitable for Europeans as the healthiest towns of India.'<sup>26</sup> In making this comparison he appears to recognise that the conceptual, and often hierarchical, understanding of these countries in the imperial imagination was framed by epidemiology. The languid inevitability

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<sup>24</sup> Ronald Ross, *Malarial Fever, its Cause, Prevention and Treatment, containing full details for the use of travellers, sportsmen, soldiers, and residents in malarious places*. 9<sup>th</sup> edn revised and enlarged (Liverpool: Liverpool University Press, 1902) p.15.

<sup>25</sup> Henry Seton Merriman, *With Edged Tools* (London: John Murray, 1894) p.42.

<sup>26</sup> H. E. Annett, 'The Work of the Liverpool School of Tropical Medicine' *Journal of the Royal African Society*, 1(1902)2 pp.208-214. (p.210).

of malaria in Merriman's conception of India is contrasted with the violent testiness of Merriman's Africa, a testiness engendered by sleeping sickness, which I will later argue is associated in fin de siècle literature with violent crime. In this thesis I will focus predominantly on the British colonies in India and Africa, and what were perceived to be their chief diseases: malaria and sleeping sickness.

Despite both India and Africa being identified as 'tropical', the differences between them were apparent in their levels of access for Europeans, a parameter in turn determined by the level of imperial involvement. The relative success of British colonisation in India was contrasted in medical discourse with the difficulty of colonising Central Africa—a topic that featured heavily in acclimatisation debates. However, both landscapes were united through a medical commonality—their associations with 'tropical' diseases. Thus despite recognition of their inherent differences both were understood in dialogue with their pathological signifiers. David Arnold argues that although in the early nineteenth century India was not considered strictly speaking within the tropics, by the late-century 'its disease [...] agriculture, even its people, were [being] steadily brought within the framework of tropicality.'<sup>27</sup> He allies this framework with the emergence of tropical medicine, arguing that 'the tropics' became 'a way of defining something culturally alien to, as well as environmentally distinct from [...] the temperate world.'<sup>28</sup> The inclusion of India within this framework of otherness is particularly significant in light of Pamela Gilbert's assertion that

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<sup>27</sup> David Arnold, *The Problem of Nature: Environment, Culture and European Expansion* (London: Blackwell, 1996) p.171.

<sup>28</sup> David Arnold, 'The Place of 'the Tropics' in Western Medical Ideas since 1750' *Tropical Medicine and International Health* 2(1997)4 pp.303-313. (p.306).



'India was increasingly seen as London's double.'<sup>29</sup> India's power to define the metropole coincided with its redefinition as an othered 'tropical' space, which raised ideological questions concerning the meaning of British nationhood.

Novels about tropical disease at the fin de siècle go some way to addressing this problem; while they articulated complex ideas about tropical spaces, they were as much about Britons and Britishness as they were about the colonies. In their separatist rhetoric of colonial difference, they reveal underlying ideological assumptions about the metropole and its claims to cultural, geographical, and racial superiority. Parasitic disease was used to separate natives from colonisers (mediated by racial understandings of infection), to express anxiety about colonial landscapes, and later, to reinforce British chivalric masculinity. As Arnold notes, the late-nineteenth century understanding of the colonies was constructed in dialogue with, and reinforced by, the emergence of tropical medicine and parasitology as medical specialties. This co-evolution had significant consequences for the cultural understanding of British imperialism, both in terms of its ideological frameworks and its functional parameters. I again choose my words carefully. I use 'co-evolution' to acknowledge that, much like the relationship between parasite and host, the discursive relationship between the tropics as a conceptual space and tropical medicine as an institution, was one born of a longer and intertwined history. Alan Bewell in *Romanticism and Colonial Disease* outlines how 'colonial experience was [always] profoundly structured by disease',<sup>30</sup> recognising that the process of

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<sup>29</sup> Pamela K. Gilbert, *Mapping the Victorian Social Body* (Albany: State University of New York Press, 2004) p.141.

<sup>30</sup> Alan Bewell, *Romanticism and Colonial Disease* (Baltimore: Johns Hopkins University Press, 1999) p.2.

using disease to 'other' colonial people was not new or unique to the nineteenth century. Likewise the anxieties about somatic identity inherent in the parasite-host relationship predate the formalisation of parasitology, as does the pathological stigmatisation of tropical landscapes. This stigmatisation, largely a product of miasmatic theories of disease transmission, was, by the mid-nineteenth century, being challenged.

Miasmatism, a predominantly environmental theory, had argued that disease was caused by poisonous exhalations—a tenet that implicated local factors, pollution, and climate in the production of illness. Although notoriously vague on the mechanics of the theory, most miasmaticists believed that these non-specific vapours penetrated the body and caused infection, illness being associated with insanitary spaces and locations. Its competing theory, contagionism, argued that disease was transmitted by person-to-person contact, via touch or breath, associating illness primarily with people, rather than with environment. In the mid-nineteenth century Louis Pasteur, Robert Koch, and Joseph Lister,<sup>31</sup> among others, popularised the germ theory of disease, which implicated specific microorganisms in the production of pathology. This refocused disease causation, allowing for both environmental and person-to-person routes, but as a specific threat from without.<sup>32</sup> The medical advancements

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<sup>31</sup> French chemist Louis Pasteur carried out a series of formal experiments to prove the link between microorganisms and disease in the 1860s. German physician Robert Koch developed four criteria (known as Koch's postulates) for proving that a given microorganism causes a given disease in the 1880s. British surgeon Joseph Lister demonstrated the practical applications of germ theory in his pioneering use of antiseptic surgical methods in the 1870s and beyond.

<sup>32</sup> The association between germs and environments would later inform debates concerning public health; likewise the association between germs and people would eventually be understood in terms of personal hygiene, and interactions with individual immune systems. The key difference between germ theory and parasitic theories of disease laid in the reliance of the parasitic life cycle on very specific geographical conditions and non-human intermediate or vector hosts.

of parasitology—specifically the discovery of vector transmission—expanded on these earlier paradigm shifts, but retained, in modified guise, some of the original climatic and environmental associations that pervaded miasmatism, and its related field: medical geography.

These interactions between environment and disease in the tropics were expressed in acclimatisation debates, conversations that Warwick Anderson identifies as 'a potent brew of race theory, geographical pathology, and global politics'.<sup>33</sup> In the 1890s, parasitologists like Manson increasingly eschewed the climatic theories that stigmatised tropical landscapes as intrinsically pathological in favour of theories that incriminated microorganisms. However, parasites have complex life cycles that involve specific intermediate or vector hosts, and sometimes free-living stages. This tied them to their environments in unique ways. Although climate was no longer thought to directly cause disease, it remained, by supporting the proliferation of parasites and their vectors, a pathological signifier—a phenomenon that is evident in late nineteenth century fiction about parasitic disease. Thus, I argue, despite aetiological paradigm shifts, the reliance of parasites on the specific flora and fauna of tropical landscapes meant that parasitology retained much of miasmatism's stigmatising power. This is succinctly expressed by Ross's own understanding of his mosquito-malaria discovery and its relationship to previous theories of infection:

Malaria is due to a miasma given off by the marsh, but the miasma is not a gas or vapour—it is a living insect. The germs of malaria do not live in the

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<sup>33</sup> Warwick Anderson, 'Disease, Race and Empire' *Bulletin of the History of Medicine* 70(1996)1 pp.62-67. (p.63).

marsh; it is the carriers of the germs, which live there. The anophelines themselves are the malarial miasma.<sup>34</sup>

This phenomenon perhaps explains why for example John Masefield, who so clearly engaged with parasitological research in his *Multitude and Solitude* (1909), continued to associate disease with the African landscape itself, an association reflected in his descriptions of this landscape as 'menacing', 'brooding', and 'malignant'.<sup>35</sup> Although not presented as having the power to directly cause disease, Africa for Masefield poses a latent threat, embodied in its flora and fauna. As Anne Marie Moulin notes of the mosquito theory put forward by parasitologists in regard to malaria, vector transmission 'shattered the simplicity of the germ theory of disease'.<sup>36</sup> Not only did it introduce a further link in the chain of transmission, but it also recast pathogen-host communication as an active process. This active process is reimaged in both *Multitude and Solitude* and H. P. Lovecraft's 'Winged Death' (1934) as a sinister act of deliberate violence.

The characterisation of the parasite by parasitologists supported this by their framing of the parasite as an animal rather than a passive 'vegetable' bacterium. This categorisation contributed to an already established conversation about the impact of parasites on host identity. If the parasite was a living animal, then its invasion seemed less like an infection, and more like competition for a somatic habitat. This raised questions about the separation of

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<sup>34</sup> London, LSHTM. RC. Ross/105/06/50. 'The Practice of Malaria Prevention by Ronald Ross, Major I.M.S. Ret. Professor of Tropical Medicine, University of Liverpool', pp.3-4. [emphasis his own].

<sup>35</sup> John Masefield, *Multitude and Solitude* (London: Grant Richards, 1909) pp.265-6.

<sup>36</sup> Anne Marie Moulin, 'Tropical without the Tropics: The Turning-Point of Pastorian Medicine in North Africa' in *Warm Climates and Western Medicine: Emergence of Tropical Medicine, 1500-1900* ed. David Arnold (Amsterdam: Rodopi, 1996) pp.160-80. (p.160).

host and parasite identities. These, and many similar concerns, were being voiced at the beginning of the nineteenth century in relation to helminthic parasites.<sup>37</sup> In 1840, before the dethronement of the theory of spontaneous generation and the elucidation of parasite transmission strategies, Dr. Rev. R. Walsh gave a lecture to the Royal College of Physicians, reprinted in the *Dublin University Magazine*, which began: 'there is no pretence, perhaps, more unfounded, or less capable of being sustained, than that which man assumes to the exclusive possession of his own body.'<sup>38</sup> This articulated a pertinent anxiety, which will underpin much of this thesis, concerning bodily integrity and its breach by morphologically distinct 'others'. Walsh argued that we shared our bodily abodes with 'ordained lodgers', who had as much right to them as us, identifying ascarides, lumbrici, and taenia (tapeworms) as 'permanent and regular occupants'.<sup>39</sup> He also recounted occasional residents, 'externs' who caused disease, and in doing so revealed a frightening depiction of bodily invasion by the natural world. With dubious stories of hundreds of insects emerging from the skin, of a woman vomiting up beetles, which 'immediately on being discharged from her mouth [...] *flew* about the room', and '*twenty-three large* plates-full' of maggots and worms falling out of tumours, Walsh constructed a graphic narrative of bodily breach, which operated in both directions. Insects making nests in the brains of patients seems more fitting of modern science fiction than nineteenth-century medicine. However, there was perhaps an empirical basis to these observations, revealed by Walsh's

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<sup>37</sup> See Glossary of Terms for definition of 'helminth'.

<sup>38</sup> R. Walsh, 'Our Fellow Lodgers' *The Dublin University Magazine* 5(1840) pp.617-24.

<sup>39</sup> The ascarides, which he describes as 'small white worms' are possibly the sperm, which some microscopists believed were parasites of the testes. See: Thomas L. Hankins, *Science and the Enlightenment* (Cambridge: Cambridge University Press, 1985) p.135.

reference to guinea worm (which causes the parasitic disease dracunculiasis).<sup>40</sup> Walsh's 'insects' were probably in reality entozoan parasites, helminths that were discovered infesting muscle and cerebral tissue post-mortem. Indeed, guinea worm, which he does not differentiate from his other 'insect' invaders, is a well-known parasitic nematode, which extrudes from the body via sores in the skin.

Even after the discovery of parasitic life cycles in the mid-nineteenth century, helminthologist T Spencer Cobbold noted that 'the notion that an intimate relation exists between lumbricoid helminths and earth-worms will probably never entirely disappear from the popular or even professional mind'.<sup>41</sup> At the end of the nineteenth century when parasitologists began engaging with this discourse, they had to negotiate these pre-existing concerns about taxonomic and somatic identity. The chief interests of specialists like Ross in the 1890s were human protozoan parasites like the malaria parasite, *Plasmodium*, and the sleeping sickness parasite, *Trypanosoma*. Broadly speaking, parasitic organisms were divided into two sub-groups: helminths and protozoans—visually distinguishable, worm-like parasites, and microscopic, single-celled parasites. These two groups, although morphologically distinct from each other, were united in their imagined similarity to the 'lower' animal orders of nature and used as metaphors to discuss human social interactions. This was predicated on their imagined conscious autonomy, autonomy continuously reinforced through comparisons to worms and insects. Such comparisons would later express complex anxieties about the power of the lower orders of nature at a time when

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<sup>40</sup> See Glossary of Terms.

<sup>41</sup> T. Spencer Cobbold, *Parasites; A Treatise on the Entozoa of Man and Animals, Including Some Account of the Ectozoa* (London: J & A Churchill, 1879) p.8.

their evolutionary inferiority was being challenged by Darwin's concept of Natural Selection.

Walsh's early characterisation of entozoa as 'residents' entered into a narrative that aligned the body with a habitat; this allegorical treatment of the body was retained by Cobbold, writing in 1864, who discussed internal parasites as 'a peculiar fauna, destined to occupy an equally peculiar territory'.<sup>42</sup> In the late-century, these characterisations created parallels with imperial expansion and further encouraged comparisons between microorganisms and humans. The conceptualisation of helminths as the original internal parasites began a motif of likeness with other animal organisms, which, when later reframed in regard to protozoa, characterised these disease pathogens as part of the animal, rather than vegetable kingdom. The use of other organismal identities as a hermeneutic to understand the parasite speaks to the chief preoccupation of this thesis: the exploration of selfhood. If parasites were similar to both lower animals, and—by analogy—to human society, that positioned them, problematically, as both evolutionary competitors and as mirrors for self-reflection.

This thesis is indebted to Laura Otis's groundbreaking study of selfhood in *Membranes: Metaphors of Invasion in Nineteenth-Century Literature, Science and Politics*. Otis recognises the definition of selfhood as inextricably linked to the definition of otherness, arguing that the category 'self' embodies all that is 'non-self' in a process of identification reinforced by difference. She identifies affinities between political and biological models of thought, and highlights imperialistic culture as providing a common language for scientists and literary authors to

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<sup>42</sup> T. Spencer Cobbold, *Entozoa: An Introduction to the Study of Helminthology, with Reference More Particularly to the Internal Parasites of Man* (London: Groombridge and Sons, 1864) p.4.

express themselves in.<sup>43</sup> It seems to me that this project of identifying 'self' and 'other', underpinned by imperial discourses of colonial difference, is given further significance by considering the understanding of the parasite-host relationship in this time period. This relationship, at the biological, psychological, and ideological levels, is infused with anxieties of invasion and colonisation. These anxieties are exemplified by Stephen Arata's exploration of the pairing of colonial fear and imperial guilt in what he calls narratives of 'reverse-colonisation'. He identifies within these fictions anxieties about primitive forces, which 'originate outside the civilised world', or can even 'inhere within the civilised itself' and reverse the power relationship between the coloniser and colonised.<sup>44</sup> This has conceptual similarities to the parasite-host relationship—to the colonisation of the coloniser—and to the rhetoric of tropical medicine, which framed parasitic diseases as overtly foreign, despite their occasional or historical occurrence in temperate as well as tropical spaces.

Malaria is a good example of this, the disease having been endemic in England from the sixteenth to the early nineteenth century. Its prevalence declined steeply during the nineteenth century, but re-emerged during the First and Second World Wars.<sup>45</sup> Despite its historical presence in England, however, parasitologists and tropical pathologists at the fin de siècle, framed malaria as the quintessential tropical disease. English malaria, known as "ague" or "marsh fever" is caused by the parasites *Plasmodium vivax* and *Plasmodium malariae*,

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<sup>43</sup> Laura Otis, *Membranes: Metaphors of Invasion in Nineteenth-Century Literature, Science and Politics* (Baltimore: Johns Hopkins University Press, 1999) p.3.

<sup>44</sup> Stephen Arata, 'The Occidental Tourist: Dracula and Reverse Colonisation' *Fictions of Loss at the Victorian Fin de siècle: Identity and Empire* (Cambridge: Cambridge University Press, 1996) pp.107-132. (p.108).

<sup>45</sup> M. J. Dobson, 'History of Malaria in England' *Journal of the Royal Society of Medicine* 17(1989)82 pp.3-7.



whilst its tropical variant is caused by the much more dangerous *Plasmodium falciparum*.<sup>46</sup> The disappearance of malaria from England during the nineteenth century, in combination with the comparative severity of the symptoms of falciparum malaria undoubtedly contributed to the framing of the disease as tropical; however, its classification as such also seems like an attempt to maintain these boundaries between the tropical and temperate zones and—by implication—between England and her colonies.

In 1902, Dr Buchanan reported a case of malaria acquired in England, in which the patient had never been out of the country and had been bitten by mosquitoes in Kent.<sup>47</sup> The significance of this case resides less in the rise in incidence of English malaria, and more in its apparent contrast to the framing of the disease by tropical pathologists, given that, as the *South Wales News* noted in 1923, 'Malaria [had] always been associated with the tropics',<sup>48</sup> an association compounded by its frequent designation as the 'curse of the West Coast of Africa.'<sup>49</sup> The framing of once English diseases as tropical and European diseases as somehow different or more severe in the tropics, are examples of the same process of differentiation that I recognise in late-nineteenth century British fiction: a process of negotiating British national identity. By partitioning European and tropical diseases, physicians justified their professional specialisms and provided frameworks for understanding the colonies as places to be sanitised by

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<sup>46</sup> M. J. Dobson, 'Malaria in England: A Geographical and Historical Perspective' *Parasitologia* 9(1994)36 pp.35-60.

<sup>47</sup> 'Reports Of Societies: Malaria Acquired in England' *British Medical Journal* 1(1902)2143, pp.205-6.

<sup>48</sup> London, LSHTM. RC. Ross/146/25/11. Clipping: 'At the Museum. Insects and Disease. Malaria' *South Wales News*, 24 March 1923.

<sup>49</sup> See e.g. London, LSHTM. RC. Ross/78/01. Clipping: 'Major Ross and the Lagos Chamber of Commerce' *The Lagos Weekly Record*, 3 August 1901.

Western medicine. The associations that these diseases had with insanitary conditions, and more broadly with a lack of civilisation, contributed to rhetorics of social and geographical difference between the metropole and its peripheries.

In *Romanticism and Colonial Disease*, Bewell recognises this process, modifying Charles Rosenberg's notion of the social framing of disease to argue for the construction of colonial spaces in the Romantic period and beyond as mediated by pathological knowledge. I argue that there is a dynamic tripartite relationship between disease, imperialism, and identity, which, in the late nineteenth century was given new meaning by the institutionalisation of parasitology. Bewell, Arata, and Otis all recognise the function of foreign frames of reference in constructing imperial metropolitan identity, and the vulnerability of this identity to the very things that it defines itself against. The difference between Walsh's 'ordained lodgers' and his dangerous 'externs' lay apparently in the breaching of boundaries—or membranes—and troublingly separates the host's identity from his or her own body by suggesting that it might be legitimately shared. For Walsh, parasites are external threats and internal realities, a tension that is explored in late nineteenth century fiction in regard to psychological identity. In Chapter One, I analyse this use of parasitic frameworks to explore psychological identity in fiction, including Robert Louis Stevenson's 'Strange Case of Dr Jekyll and Mr Hyde' (1886) and George MacDonald's *Lilith, A Romance* (1895). The 'conflict' between the host and parasite in biological discourse, meanwhile, was now upheld as a stand-off between internal host identity and an external foreign agency—a relationship underscored by T. Spencer Cobbold's notion of a 'peculiar fauna' invading and occupying another's territory. In line

with the apprehension inherent in Otis's notion of semi-permeable membranes, and Arata's concept of reverse-colonisation, parasitology and its fictions highlighted the fragility of these categories of difference (self/non-self, metropole/periphery), by drawing attention to the vulnerability of the host body, mind, or country to usurpation. The parasite's prolonged encounter with the host and its power to transform (rather than simply conquer) places the parasite and host within a power dynamic that acts as a framework for exploring both biological and political relationships.

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Eminent German pathologist, Rudolph Virchow, was, like Cobbold, a proponent of parasitology's sister and precursor discipline, helminthology. He described the life cycle of *Trichinella spiralis*, a parasitic worm that infests pork and, when eaten, causes the muscle-wasting disease trichinosis.<sup>50</sup> The disease was popularised by several outbreaks in Germany in the 1860s, a phenomenon that, for the British, paired foreign sausages with disease:

The British tourist has a great mistrust of foreign sausages, and, if a traveller in Germany watches the diners at a restaurant, he will generally find that those who come from the United Kingdom look askance at the *Delicatessen* and absolutely reject a *Wurst*. They have heard of a disease caused by a parasite derived from sausage and badly cooked pork, and

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<sup>50</sup> Also called trichiniasis.

their fears are not groundless. Even the native is aware of the danger, and some thirty years since this fact was made the subject of a caricature in a German paper. A professor had ordered a sausage, and when the waiter asked, "With sauerkraut?" the man of science retorted: "No; with a microscope!"<sup>51</sup>

The jocular treatment of parasitic infestation here doesn't quite belie the horror of the trichinosis outbreak, which killed eighty three in the small country town of Hettstadt in 1864,<sup>52</sup> and a further ninety in Hedersleben in 1866.<sup>53</sup> Described as a living poison by the *British Medical Journal*, the *Trichinella* roundworm was identified as particularly dangerous owing to its microscopic size and thus its unrecognisable appearance (to the naked eye) in undercooked meat. Virchow used this visual subtlety to his advantage when challenged by the then chancellor of Germany, Otto von Bismarck. Virchow had criticised what he considered to be Bismarck's excessive military budget, and feeling personally affronted, Bismarck challenged him to a duel. Virchow reportedly chose two sausages as his weapons of choice, one perfectly healthy, and the other infested with *Trichinella* parasites. He proposed, instead of a duel, a gastronomic Russian roulette, but the Chancellor refused the terms, and as the *Liverpool Echo* and *Yorkshire Gazette* reported a few years later, 'no duel was fought, and no one accused Virchow of cowardice.'<sup>54</sup> Amusing as this anecdote is, it reflects more broadly the weaponisation of disease

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<sup>51</sup> 'Trichinosis' *British Medical Journal* 2(1898)1969, p.914.

<sup>52</sup> 'Recent Outbreaks of Flesh-Worm Disease or Trichiniasis, in Germany' *British Medical Journal* 1(1864)159 pp.75-77. (p.75).

<sup>53</sup> 'The Last New Disease' *Nottinghamshire Guardian*, Friday 19 January 1866, p.6.

<sup>54</sup> 'A Novel Duel Which Did Not Come Off' *Liverpool Echo*, Wednesday 28 June 1893, p.3. Reprinted in the *Yorkshire Gazette* in 1895.

See also: Myron Schultz, 'Rudolf Virchow' *Emerging Infectious Diseases* 14(2008)9 pp.1480-81.

in the nineteenth century—a concept that would gain traction with Eli Metchnikoff's theory of phagocytosis as an active process and its implications for the immune response. Battles between parasites and their host's cells, between parasites and parasitologists, between man and nature became the hermeneutic frameworks for literary authors and scientists alike. The *Review of Reviews* in 1890 published an article (authored by Arthur Conan Doyle) on Robert Koch, widely known for his research in tropical disease, in which he was described as an 'illustrious discoverer' and a 'great master mind'.<sup>55</sup> The article was accompanied by a character sketch with a cartoon of Koch as 'the new St George' defeating the tubercle bacillus with a microscope for a sword and 'investigation' for a horse.<sup>56</sup> This encapsulates the dominating mode of thought in regard to medical researchers at the fin de siècle. Parasitologists would later monopolise the image of the knight-adventurer and his semantic relationship to nationhood, staging battles like the one depicted here in retrospective accounts of their findings. Newspaper articles readily supported their romanticising in this manner, bolstered by the speeches of researchers and politicians, who championed the pairing of tropical medicine and imperial might. It is perhaps significant that Koch's bacillus is depicted as a snake, having little morphological similarity to the bacillus (which is rod-shaped), and carrying all the cultural cachet of original sin. The pathogenic microorganisms inside man, in this case, retain much of the stigma of the original models of parasitic infestation—parasitic worms.

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<sup>55</sup> Arthur Conan Doyle, 'Dr. Koch and his Cure' *Review of Reviews* 2(1890)12 pp.552-560. (p.552).

<sup>56</sup> 'Character Sketch. Dr. Robert Koch' *Review of Reviews* 2(1890)12 pp.546-551. (p.547). For the illustration see Appendix 2.

When Charles Laveran discovered the malaria parasite, *Plasmodium*, in the 1880s, it—in American army physician George Sternberg's words—'differ[ed] from all disease-germs hitherto discovered, inasmuch as it [did] not belong to bacteria, and [was] not even a vegetable parasite.'<sup>57</sup> Subsequent observers also took pains to separate this protozoan parasite from bacteria, partly in an attempt to discredit the malaria bacillus put forward by Edwin Klebs and Corrado Tommasi-Crudeli in 1879, and partly—in the case of parasitologists—as an attempt to define their professional niche. When Laveran reported his discovery, he allied the parasite with a nematode worm,<sup>58</sup> further distancing it from bacteria and connecting these two groups of 'true' parasites by alluding to the reliance of both protozoa and helminths on complex life cycles. The morphological similarity of both helminths and protozoa to worms, insects, and crustaceans, and their transmission by vector hosts, held a particular poignancy in the public imagination stemming from the discomfort inspired by the concept of the invasion of one's body by another organism. Although many of the broad themes in this thesis can and do apply to microorganisms at large, I argue that these phenomena are especially associated with parasitic helminths and protozoa in this period owing to the ways in which they were framed by parasitologists, their associations with imperial discourse, and their relative novelty in the public imagination.

In 1905, the British periodical *Truth*, known for its exposés of fraud, published a poem beneath an announcement of the discovery of a new disease

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<sup>57</sup> George M. Sternberg, 'The Malarial Germ of Laveran' *Science* 7(1886)165 pp.297-99. (p.298).

<sup>58</sup> See: Charles Louis Alphonse Laveran, 'A Newly Discovered Parasite in the Blood of Patients Suffering from Malaria. Parasitic Etiology of Attacks of Malaria.' Reprinted in *Reviews of Infectious Diseases* 4(1982)4 pp.908-11.

by the Liverpool School of Tropical Medicine: trypanosomiasis. The article noted that 'British-born people are said to be specially liable to it'. The poem, entitled 'the disease of the day', satirised the popularity of the disease in the press by incriminating it for all Britain's ills including: the bad weather, the sagging market, the wreck of *SS. Shamrock*, and the rage for 'ragging'. The impact of the colonies on England is here made literal, highlighting Britain's 'craze' for tropical medicine:

We knew the Government must be  
By some malignant germ infested;  
Some secret malady we felt  
Was by its reckless acts suggested:  
But now the truth comes out at last,  
And in its muddling course one traces  
Sign that it has this ailment new –  
And it has it very badly, too –  
Confirmed Try-pan-o-so-mi-a-sis!<sup>59</sup>

This satire is testament not only to the familiarity of the lay mind with this 'newly discovered' disease, but also to the position that the colonies, and in particular Africa, occupied in relation to Britain. The trade links between Britain and her colonies resulted in a huge increase in patients admitted to port hospitals with tropical diseases. The visibility of these 'foreign' diseases on British soil in part

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<sup>59</sup> 'The Disease of the Day' *Truth*, 21 May 1905, n.p.

instigated the institutionalisation of the London and Liverpool schools of tropical medicine, which were set up in response to the lack of training for British physicians overseas, global research competition, and the impact that disease had on overseas trade. This is reflected in a review of Manson's *Tropical Diseases* in 1898, which argued that it would 'be useful, not only to those who intend to practice in the tropics, but to those whose lines are cast in our seaports or on our ocean steamboats'.<sup>60</sup> The trypanosomiasis of the poem above takes advantage of this translocation of disease; however, rather than simply expressing an epidemiological 'reverse-colonisation', the satirical tone suggests an attack on the entwined politics of Britain and her colonies, on the overabundance of press coverage concerning the disease, perhaps even on the eagerness to name yet another 'new' ailment. Trypanosomiasis would around this same time become recognised as a term representative of a variety of human and animal trypanosome diseases including: African sleeping sickness, trypanosoma fever, nagana/tsetse-fly disease and surra. Trypanosomiasis gained particular visibility around this time owing to the London and Liverpool sleeping sickness expeditions, and the connections they were making between this disease and the presence of trypanosomes in the blood.<sup>61</sup> The animal diseases, nagana (tsetse fly disease) and surra, were contrasted with this 'new human disease', which was in 1903 shown to be the first stage of sleeping sickness. The poem satirises the *in vogue* status of trypanosomiasis, and by extension, tropical medicine at large.

This thesis explores the cultural impact of parasitology in the period 1885-1935 during its emergence as a sub-specialty. I analyse the ways in which the

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<sup>60</sup> 'Tropical Diseases: A Manual of the Diseases of Warm Climates by Patrick Manson' *British Medical Journal* 2(1898)1959 pp.157-58. (p.158).

<sup>61</sup> See Appendix 1 for a timeline of these discoveries.



discipline emerged in dialogue with this cultural moment. Parasitologists used the Arthurian revival as a framework for talking about their research, and used the imperial politics that surrounded their subject matter to bolster their rhetoric. As part of the nationhood narrative, parasitologists and literary authors co-created figures of imperial and scientific vigour, reflected in the glorification of Ronald Ross and Patrick Manson, among other researchers, and the literary depictions of what might be considered their imaginative counterparts: the scientific detective and the tropical explorer. Parasitology was chiefly a science concerned with disease in the colonies, and yet its work was two-fold: research in colonial spaces and mediation in the metropole. Thus the construction of knowledge about empire took place in England, just as avidly as it did in the tropics. Ross's seminal work proving the mosquito vector for malaria, and subsequent work on leishmaniasis was carried out in India; Manson's work on elephantiasis, which provided a basis for the vector theory of parasite transmission, was carried out in Amoy, China; and much of the work on trypanosomiasis was carried out in Africa. However, despite the geographical practicality that the colonies offered, tropical research was carried out in tandem with England, as I will demonstrate. From the power of the secretary of state for the colonies to grant funding requests, to the authority of the British medical press in disseminating research findings, the metropole held a monopoly on medical authority. This duality is reflected in the parallel narratives contained in novelistic encounters with tropical disease, which invariably juxtaposed British and colonial experiences in order to reinforce or question British heroic masculinity, and ultimately, British national identity.

The discourses produced by parasitology's formalisation and its subsequent political and ideological entanglements are multi-form. I will first chart the symbolic influence of parasitism through a brief overview of helminthology and its early interactions with ideas about somatic and psychological identity. The cultural baggage of the parasite, inherited with its naming, encouraged a natural dialogue between science and literature. Parasites are organisms that live on, in, or with another organism, obtaining food, shelter or other benefit, at the expense of the host.<sup>62</sup> We now think of biological parasites as models for social exploiters and frequently apply the metaphor of the parasite to the social world. However, originally this metaphor worked in reverse. Parasite from the Greek *para + sitos*, meaning literally 'beside the grain' originally referred to the temple assistants who would separate the grain for religious ceremonies and who received, in exchange, a free meal.<sup>63</sup> Glossed variously as 'a person who eats at the table of another', 'a person who lives at another's expense and repays him or her with flattery', 'a person who dines with a superior officer', and 'a priest who is permitted meals at the public expense', the parasite became a figure associated with gastronomic exploitation.<sup>64</sup> The term was then borrowed by Middle Comedy poets and fused with the *kolax* (a hungry opportunist who got what he wanted by flattery) to form a new comic character.<sup>65</sup> Ultimately the figure of the parasite evolved in cultural discourse as one who by deception

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<sup>62</sup> 'Parasite, n. 2a' *Oxford English Dictionary* 3rd edn. (Oxford: Oxford University Press, 2005) <<http://www.oed.com/view/Entry/137636>> [20 March 2016].

<sup>63</sup> See: Geoffrey W. Arnott, "Studies in Comedy, I: Alexis and the Parasite's Name" *Greek, Roman and Byzantine Studies* 9(1968)2 pp.161-68.

Edward Phillips, *The New World of Words; or, Universal English Dictionary*, ed. J. K. Philobibl vol. 1, 7th edn. (London: J. Phillips, 1720) in *Eighteenth Century Collections Online*. [accessed 21 March 2016].

<sup>64</sup> 'Parasite, n. 2a', *OED*.

<sup>65</sup> Elisabeth Ivory Tylawsky, *Saturio's Inheritance: The Greek Ancestry of the Roman Comic Parasite*. (New York: Peter Lang Publishing, 2002).

exploited his host for material gain and gave nothing in return. In the seventeenth century, this social archetype was transferred to the scientific sphere when proto-botanists likened certain plants to the parasite.<sup>66</sup> However, it was in the nineteenth century that the term was fully incorporated into biological discourse, and existed in tandem with the social parasite, to which it was an organic counterpart. The material exploitation of the social parasite was contrasted with the biological exploitation of the organic, and both were considered a drain (financial or physical) on their host. This instigated a two-way transfer of attributes that saw the anthropomorphism of the biological organism and the pathologisation of the social archetype. This phenomenon is recognisable in late nineteenth-century fiction, which offers a hybridised version of the two archetypes as one figure, which I have elsewhere called 'the literary parasite'.<sup>67</sup> Anne-Julia Zwierlein has analysed the figure of the parasite in nineteenth century literature and science, recognising the dialogue created by its etymological heritage. In a fascinating article that charts the ambivalent position of parasites in medical and evolutionary discourse, recognised as both beautiful and dangerous—as morphologically simple and evolutionarily well-adapted—Zwierlein argues that the biological parasite was increasingly psychologised at the turn of the century. She argues that in this period the literary figure of the

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<sup>66</sup> See for example: Thomas Browne, *Pseudodoxia Epidemica* ed. Robin Robbins. (1646; New York: Oxford University Press, 1981) p.148: 'Mistletoe [...] such as living upon the stock of others are termed parasitical plants.'

Ephraim Chambers, *Cyclopaedia: or an Universal Dictionary of Arts and Sciences* vol.2. (London: Printed for James and John Knapton, 1728) p.355: 'Parasites, or parasitical plants [...] so called from their manner or living and feeding, which is altogether on others.'

<sup>67</sup> For a full account of this phenomenon and more on its evolution see: Emilie Taylor-Brown, "'She Has a Parasite Soul!' The Pathologization of the Gothic Monster as Parasitic Hybrid in Bram Stoker's *Dracula*, Richard Marsh's *The Beetle*, and Arthur Conan Doyle's *The Parasite*' in *Monsters and Monstrosity from the Fin de Siècle to the Millennium* eds. Sharla Hutchinson and Rebecca A. Brown (Jefferson: McFarland, 2016) pp.12-28.

parasite was 'transferred on to an interiorised pre-Freudian psychological [...] plane, the parasite symbolising the protagonists' own deepest anxieties.'<sup>68</sup> It is this hermeneutic framework that I will use in my first chapter, where I bring to bear the power of the parasite-host relationship and its related discourses on explorations of psychological selfhood.

The prevalence of the parasite as a motif for critiquing society, and, importantly, its liminal position as an archetype informed by both the organic and social worlds was bolstered by evolutionary and early psychoanalytical discourses. The parasite-host relationship became a framework for thinking about concepts of self and other, underscored by biogenetic anxieties. I will discuss these frameworks in relation to Robert Louis Stevenson's 'Strange Case of Dr Jekyll and Mr Hyde' (1886), analysing the dynamic between Jekyll and Hyde as analogous to the parasite-host relationship. I argue that Stevenson's text presents anxieties concerning atavistic degeneration, but with distinctly psychological overtones. George MacDonald, I argue, also uses the parasite-host relationship to explore psychological models of selfhood. I will examine the ways in which MacDonald fuses theological ideas with Lamarckian and Darwinian notions of embryological development in his 1895 novel *Lilith, A Romance*. Both these authors demonstrate understandings of the human psyche (echoed in later Jungian psychoanalysis and Freud's recently rediscovered phylogenetic thought-experiments), which are rooted in the ontogeny-phylogeny parallel. The parasite-host relationship becomes both a template for defining self and other, and, in

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<sup>68</sup> Anne-Julia Zwierlein, 'From Parasitology to Parapsychology: Parasites in Nineteenth Century Science and Literature' in *Unmapped Countries: Biological Visions in Nineteenth Century Literature and Culture* ed. Anne-Julia Zwierlein (London: Anthem Press, 2005) pp.155-72. (p.169).

these novels, a model for understanding the heterogeneous nature of selfhood. The Id/Ego dynamic is here important, with Stevenson and MacDonald exploring unconscious drives as symbolically parasitic. The connection between primitivism or base desires and parasitism is in part inherited from the biological understanding of parasites as morphologically simple, a tenet that comes to underpin the anxiety surrounding their pathological influence. Thus the parasite becomes a symbol pertinent to the public imagination even before parasitology's formal establishment at the turn of the century.

In Chapter Two, I will explore the discourses that accompanied the institutionalisation of parasitology. I argue that parasitologists consciously engaged with literary culture and used it as a vehicle for scientific communication. Using the Arthurian revival as a template, parasitologists created romanticised professional identities that spoke to literary and historical understandings of British nationhood. This national identity relied heavily on its connection to the British imperial project and thus these discourses framed tropical medicine and parasitology as sciences that reinforced British global prowess. However, their use of Ancient Greek mythology and heavy reliance on the tropes of adventure romance fiction expose the disparity between the imaginative narratives of parasitologists and the less-glamorous reality.

In Chapter Three, I will explore the reciprocal relationship between parasitology and two literary genres: adventure romance and detective fiction. In the first section, I will explore the impact that changing understandings of disease transmission had on literary depictions of the tropical world and the role that fiction played in popularising these theories to a non-specialist audience. The

morality narratives associated with parasitic infestation cultivated in the early nineteenth century persisted in literary depictions of parasitism well into the twentieth, evolving from a direct connection with infestation to an indirect behavioural association that saw parasitic disease and criminality in a tripartite relationship with colonial spaces. This discourse interacted with the racially separatist understanding of disease transmission in the tropics and the inherent racism of colonial anthropology. I will explore this dynamic, discussing the shift from miasmatic to vector-borne understandings of parasitic disease and the impact that this had on novelistic encounters with malaria and sleeping sickness. In the second section I will focus on the dynamic tripartite relationship between disease, criminality, and the tropics, exploring the pathologisation of criminal behaviour in dialogue with the construction of the scientific detective.

In Chapter Four, I will explore literary and scientific depictions of the parasitic organism. This exploration will comprise three parts: an analysis of the personification of the parasite, an exploration of parasitic discourses as rhetorics of warfare, and an argument for the interaction of a literary archetype—the vampire—with parasitological discourses. The first section will demonstrate that the parasitic organism was chiefly understood in opposition to bacteria. Parasitologists highlighted morphological differences between these organisms and the methodological differences between their research specialisms. Parasites were heavily associated with active transmission strategies and so given seemingly more proactive roles in causing disease. The discovery of arthropod vectors and their role in disease transmission in many ways retained the geographical stigma of tropical landscapes by incriminating the flora and fauna of

these spaces. However, it also presented the possibility of sanitisation: by policing vector breeding grounds and protecting themselves, individuals could avoid infestation. The enormity of this project, described as a 'war' by the press and envisioned as such by sanitarians, however, almost negated this paradigm shift. The war against disease in the tropics was a war against nature, against the flora and fauna of the tropics. As a result the arthropod vector, which was so heavily reliant on the tropical environment, became a synecdoche for tropical pathology generally. In the second section, I will shed light on the parasite-vector-host relationship and its impact on conceptions of personal and national identity.

Elie Metchnikoff's theory of phagocytosis and its renegotiation of the immune response interacted with parasitologists' characterisation of protozoa, and of active transmission, to express anxieties concerning the 'conflict' between man and nature.<sup>69</sup> This was predominantly expressed in scientific and literary texts using metaphors of warfare, which bolstered the parasitology brand discussed at length in Chapter Two. The agency afforded to the arthropod vector in fiction reflected their anthropomorphism in scientific and popular treatise. Parasitologists understood the parasite-vector-host relationship as demonstrative of a microcosmic world and spoke about transmission strategies using social metaphors and human frames of reference, placing them on a parallel with humanity. Consequently, insect vectors were made antagonists in fiction and invested with malicious agency, as in John Masefield's *Multitude and Solitude* (1909) and H. P. Lovecraft's 'Winged Death' (1934).

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<sup>69</sup> For an account of Metchnikoff's theory see Siamon Gordon, 'Eli Metchnikoff: Father of Natural Immunity' *European Journal of Immunology* (2008)38 pp.3257-64.

British doctor, George Lovell Gulland, wrote a letter to Ross in 1905, containing a poem entitled 'The Lament of the Mosquito', which endowed the vector with a voice, and positioned it in direct combat with Ross. The poem, written on the way to a country consultation, suggested that sleeping sickness might also be spread by the mosquito, and expressed a concern regarding the potency of the mosquito as a transmitter of disease:

We laid our eggs so gaily in the pools beside the stream,  
And we watched the larvae hatching out with glee,  
We handed out Malaria to everyone that came,  
And not a soul suspected it was we!<sup>70</sup>

The poem continues, detailing the impact of Ross's mosquito-malaria work and the resultant change in public health and sanitation. However, Gulland then voices an anxiety about the mosquito's continued pathological threat:

They say its — — that's done it, he's a cruel-hearted man,  
Though they think him quite a swell across the sea,  
But to make him feel my vengeance I've devised a little plan,  
Which will make him often sadly think of me,  
For I'm taking a ship to England, to bite him ere I die,  
With a special new disease I've got in store.

This vision of epidemiological vengeance is strikingly similar to a 1934 short story by H. P. Lovecraft wherein a slighted researcher sends a crossbred tsetse fly

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<sup>70</sup> London, LSHTM. RC. Ross/145/04/01-13. George Lovell Gulland, 'The Lament of the Mosquito', 15 February 1905.



to England to infect a colleague with sleeping sickness. The translocation of parasitic vectors to England and their transmission of a 'special new disease'—a legitimate concern for tropical pathologists—had also been voiced in 1897 by Bram Stoker in his eponymous *Dracula*. In the third section of Chapter Four, I will argue for a reading of vampirism as a parasitic blood disease and Count Dracula as a monstrous depiction of vectorism. Stoker's novel expresses complex ideas about disease transmission, colonial politics, and western medical authority. In his antithesis between the Count and the Crew of Light, I read the staging of western medical science versus eastern disease. The connection between vampirism and tropical disease was later again expressed in British parasitologist John Macfie's poem 'The Vampire's Grave' (c1911). 'Nigeria! Accursed Coast!' bemoaned Macfie, using a metaphor that positioned Nigeria as both personified parasite and host country to parasitic disease. The vampire is overtly paired with the vector when Macfie describes the transmission of disease during the extraction of 'life blood':

Awake! Awake! Night plays the host, and bide you to your bloody feast

Drink and live till dawn dyes the east. Nigeria! Accursed Coast!

How have you fed your phantom life, how many heroes battered on?

[...]

You laugh to see the new men come, rich red blood pulsing through their veins,

You know with what enduring chains to bind them to their lingering doom,

For fatal fascination draws your victims to you year by year,

Do you instil the poison where you suck the lifeblood to your jaws?<sup>71</sup>

The poison of parasitic disease is here made the heroes' 'lingering doom', an image that expresses both the chronic nature of relapsing diseases like malaria and sleeping sickness and the fascination embodied by colonial spaces. In his description of the transfer of 'poison' during the sucking of blood Macfie makes Nigeria a synecdoche for the insect vector and demonstrates the fitness of the vampire as a motif for describing the parasite-vector-host relationship. These poems, both written by medical men, demonstrate the importance that the literary imagination played in the foundation of parasitology as a discipline. From Ross's anthropomorphic understanding of the relationship between the *Plasmodium* parasite and white blood cells as like that of a villain to the three musketeers, to Macfie's understanding of Nigeria as a vampire, I will chart the ways in which parasites and their diseases were understood using the language and metaphors of fiction. The parasitology narrative worked to popularise and legitimise tropical research, but was also internalised by its proponents and came to represent a linguistic doubleness that mediated and expressed the anxieties engendered by parasitic organisms. Likewise, fictional encounters with parasitic disease were always critically engaged with the politics of parasitology's pivotal role in Britain's understanding of its own identity, and, as such, often had a marked impact on the contextualisation of the discipline in the public sphere. Diseases of the tropics were first and foremost diseases of the 'other', however once

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<sup>71</sup> London, LSHTM. Macfie, John William Scott (1879-1948). GB 0809 Macfie/03/02/03. John Macfie, 'The Vampire's Grave'.

specialised research revealed the secrets of these diseases, this distinction had to be renegotiated. The assumptions that underpinned out-dated notions of parasitic disease also underpinned notions of 'tropicality' more generally, and in deconstructing these assumptions parasitologists reframed Britain's relationship with the tropical world at large. I argue that by investigating the dialogue between science and literature in this fifty-year period, we gain a valuable insight into the ways that disease helped structure our comprehension of what it meant to be British in an increasingly global world.

## Psychological Troglodytes and Gently Licking Worms: Parasites in moral, social and somatic discourse.

If our eye sight were enlarged [...] we should appear to be the most amazing spectacle in the whole world: there should we see an infinite number of worms swimming in the blood and sallying from the heart through the arteries, and returning back by the veins: there should we see thousands of living animals of various shapes and sizes crawling in the eyes, nose and ears; the very mouth filled with them, the tongue stuffed full of them, the gums tormented, and the teeth excavated by them. Nay, we should see not only the brain full of them, but the flesh abounding with them, and the very bones perforated by them; and thousands every moment crawling through the pores of the skin.<sup>1</sup>

This statement from William Ramesey's 1727 theologico-philosophical dissertation vocalises an anxiety pertinent to the scientist, literary scholar, and general reader alike: the potential presence within the body of myriad unseen

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<sup>1</sup> William Ramesey, *A Theologico-Philosophical Dissertation concerning Worms in All Parts of Human Bodies Containing Several Most Curious and Uncommon Observations of Natural Productions. In a Letter to a Friend*. (London: Printed for A. Bettesworth at the Red Lion; J. Osborn and T. Longman at the Ship in Pater-noster-Row; and J. Silver bookseller in Sandwich, 1727) p.6. There is some controversy as to whether this should be attributed to Ramesey or to Gerard de Gols, Clerk of Sandwich, Kent. I have gone with the more common practice to aid location.

agencies.<sup>2</sup> Ramesey's descriptions, although far removed from the time period of this thesis, demonstrate that observations of the microscopic world, from the very first, prompted an uneasiness concerning bodily integrity. This uneasiness would come to the fore in the nineteenth century following the incrimination of micro-organisms in many high profile diseases and the formalisation of the disciplines concerned with them: helminthology, bacteriology, and parasitology. Ramesey outlined many of the anxieties of the parasite-host relationship before he had the professional frameworks in which to discuss them or the experimental proof to back up his claims. When these frameworks finally emerged in the mid-to-late nineteenth century, the anxieties inherent in Ramesey's descriptions of parasitic infestation underpinned public understanding of parasitic disease. Outlining these anxieties, as well as the ideological and theoretical concerns that surrounded them, will help contextualise my later readings of the reformulation of these anxieties in late-nineteenth century fiction.

Ramesey's 'agencies', identified as parasitic (implied by the verbs 'tormented' and 'excavated'), challenge individual identity. He convicts the parasitic worm of the crime of causing pimples and skin complaints, suggesting that when worms 'infect the body from without and creep into the skin and lay their eggs there' they produce 'bad irruptions'.<sup>3</sup> Quoting Dr. Andre's authority on 'cutaneous worms', he propounds:

When the blood is over-flock'd with these Worms, it throws them out into  
the Capillary Veins, whence they are thrust further into the Pores of the

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<sup>2</sup> I do not, of course, mean to suggest that the scientist, literary scholar, and general reader are mutually exclusive, only that this notion of infiltration by other agencies is a concern that resonates at all levels of thought: methodological, imaginary and everyday.

<sup>3</sup>Ramesey, p.8.

Skin; and the Pores not being of sufficient Wideness [...] they work their way thro', and cause those little Inflammations call'd Pimples, or Pustules, and their little Claws, or Teeth, [...] labouring to make a way for themselves, cause that Itch.<sup>4</sup>

Ramesey suggests that excess worms try to escape from the pores and in the process damage them—a dynamic extension of the notion that intestinal worms cause bodily illness. His view—voiced in the opening quotation—that man is 'made up' of worms was compounded by the discovery of microorganisms, then christened 'animalcules', by Antonie van Leeuwenhoek (1632-1723) in the late seventeenth century. Observing microscopic living animals (bacteria, protozoa, and fungal spores) in drops of rainwater, faeces, and saliva, Leeuwenhoek opened up a whole new world to man, a world that would later become the subject of the science of microbiology.<sup>5</sup> When Ramesey says 'the Human blood is full of *worms*, living animals floating in the serum', he was probably referring more generally to microorganisms, which Nicholas Andry, among others, had characterised as 'worms' in 1700.<sup>6</sup> However, this might equally have described the presence in the blood of microscopic helminths, like filariae,<sup>7</sup> which would not be identified

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<sup>4</sup> Ramesey, pp.4-5.

<sup>5</sup> Michael J. Pelczar, E. C. S. Chan and Noel R. Krieg, *Microbiology: An Application-Based Approach* (New Delhi: Tata McGraw Hill, 2010) pp.3-4. Note: Credit should also go to English microscopist Robert Hooke, whose publication *Micrographia* (1665), and subsequent observations were arguably foundational in Leeuwenhoek's success. See Howard Gest, 'The Discovery of Microorganisms by Robert Hooke and Antoni van Leeuwenhoek, Fellows of the Royal Society' *Notes and Records of the Royal Society of London* 58(2004)2 pp.187-201.

<sup>6</sup> 'The History of the Germ Theory' *British Medical Journal* 1(1888)1415 p.312.

<sup>7</sup> The microscopic thread-like nematode worms responsible for many parasitic diseases, including elephantiasis (Lymphatic filariasis).

scientifically until the 1860s, by Jean-Nicholas Demarquay in France, Otto Henry Wucherer in Brazil, and Scottish physician Timothy Lewis in Calcutta.<sup>8</sup>

Although, in this case, Ramesey wrongly attributes dermatological complaints to parasitic worms, his accusation took part in a wider discussion about bodily invasion and the unease inspired by the idea of other organisms residing in the body. This unease was especially associated with parasitic worms owing to their morphological similarities to earthworms and other more familiar organisms—an initial comparison that leaves a legacy in nineteenth-century biological and imaginative discourse. Although seemingly hyperbolic, Ramesey's descriptions bear striking similarities to news reports about filarial infestations in the 1880s. One report from 1883 observed:

It has been ascertained beyond doubt that the blood-vessels of a human being capable for performing his daily avocations may contain 20,000 to 30,000 minute embryo hematoid worms [...] Researches have also revealed the curious fact that these teeming multitudes of hematoids hide in some unknown recess of the vascular system through the daytime, and that only as night approaches do they wander at large through the vessels generally.<sup>9</sup>

The idea of these creatures 'wandering about' at night and reeking havoc on their host's body recalls Ramesey's descriptions of his worms climbing through veins and pores. His imaginative fantasy about the host body in the eighteenth century

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<sup>8</sup> F. E. G. Cox, 'History of Human Parasitology' *Clinical Microbiological Reviews* 15(2002)4 pp.595-612. (p.599).

<sup>9</sup> 'Parasites in the Human Body' *The Evening News*, 1 March 1883, p.4.

matches the accounts of microscopists in the nineteenth observing these creatures in the blood. However, whilst parasitologists admitted that parasitic worms could occasionally exist as benign interlopers, Ramesey was quick to attribute malign intent to his worms, which are for him so pervasive as to almost eclipse host identity. For Ramesey, parasitic infestation is the natural state of the body, allied with biblical punishments and original sin. He even considers the 'human seed' to be full of little animals (here clearly influenced by the wormy aesthetics of sperm); this associates agents of parasitic disease with vertical transmission—an idea that had been ventured by Italian naturalist Antonio Vallisneri in 1713, and on which I will expand later in this chapter.

Ramesey's fantasy of a fully infiltrated body—'the true state of our bodies' as a 'mass of *worms*, a walking Corps'—is founded upon the theological belief in a 'true' state of being hidden from our imperfect sight. He makes the connection between the plagues of Ancient Egypt and the production of worms within the body:

It has generally been thought that the plague of lice inflicted on the Egyptians was External only: but I am of the opinion [...] it was internal also; that the very Dust of the Land drawn in by the Breath, and which was drove into the Nostrils, Eyes, Ears and Pores of the Body, were converted into living Worms within them.<sup>10</sup>

This narrative offers an indirect explanation for the phenomenon of parasitic infestation and in the process connects entozoa with spontaneous generation. He

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<sup>10</sup> Ramesey, p.15.



notes 'by the Word WORM or MAGGOT, I would express any, and every kind of Vermin soever of what Shape or Form, or Figure, it may be, that breeds in human Bodies little Animals, *Animalcula*, little living creatures',<sup>11</sup> perhaps suggesting that to him 'worm' is more akin to 'seed' or 'larvae'. This mirrored the understanding of English microscopist Robert Hooke who also generalised microscopic organisms by referring to them collectively as 'worms' in one of the earliest accounts of microorganisms: 'we find the humours and substances of the body, upon *putrefaction*, to produce strange kinds of moving vermine: the putrefaction of the slimes and juices of the Stomack and Guts, produce Worms almost like earth-worms.'<sup>12</sup> The rather fuzzy connection between worms, animalcules, Divine judgement, and disease suggests an intrinsic pathological quality to these hidden infiltrators—a theory of disease causation that had been expressed by many, but would not be confirmed in regard to microorganisms until the widespread acceptance of germ theory in the late-nineteenth century. Thus the anxiety expressed in Ramesey's dissertation—which evokes the discourses of spontaneous generation and parasitic infiltration, and discusses man's microcosmic and macrocosmic identity—would resonate even more poignantly a century later, when these subjects were being fiercely debated in the public sphere. The biblical explanations for parasitic infestation began a morality narrative that would overshadow parasitic understandings of disease transmission in the public sphere for years to come.

In this chapter I will explore these discourses and their legacies in

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<sup>11</sup> Ramesey, p.10.

<sup>12</sup> Robert Hooke, *Micrographia, or Some Physiological Descriptions of Minute Bodies made by Magnifying Glasses, with Observations and Inquiries Thereupon* (London: Jo. Martyn, and Ja. Allestry, 1665) p.123.

parasitic and helminthological thought. I will consider particularly their intersections with other emerging preoccupations in the nineteenth century, such as the nature of psychosomatic identity and the moralising narratives that underpinned evolutionary biology. Man was no longer considered a complete, hermetically sealed individual, but a contested locus of multiple invasive, traumatic, and collective identities. As we've seen with Ramesey's dissertation, parasitic worms were underscored in the popular imagination of the eighteenth century by their association with the controversial theory of spontaneous generation. This doctrine purported that living organisms could be spontaneously generated from inorganic matter.<sup>13</sup> As an explanation for the origins of life and as a theory of disease causation, it was believed that certain plants and animals were capable of being spontaneously generated. As David Grove argues, so-called 'imperfect' animals, like insects and worms, were especially associated with this process. Even after other explanations for animal origin were established, most physicians continued to believe in the spontaneous generation of insects and worms due to the absence of observable ova.<sup>14</sup> The term 'worm' was used to refer to earthworms and intestinal worms, as well as to larvae of insects and even to microorganisms.<sup>15</sup> This broad understanding of worms encouraged the conceptual amalgamation of multiple organisms. Leeches, earthworms, helminths, and maggots, along with their cultural and biological associations,

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<sup>13</sup> John Farley, 'The Spontaneous Generation Controversy (1859-1880): The Problem of Abiogenesis' *Journal of the History of Biology* 5(1972)2 p.285.

<sup>14</sup> David Grove, *A History of Human Helminthology* (Oxford, Oxford University Press, 1990) pp.29-32.

<sup>15</sup> Eugene S. McCartney, 'Spontaneous Generation and Kindred Notions in Antiquity' *Transactions and Proceedings of the American Philological Association* 51(1920)1 pp.101-115. '...the ancient word for worms, as well as the word 'worms' in popular meaning today, include the larvae of insects.' [see footnote 34] (pp.103-4).

were all identified under the banner 'worms', which were consequently associated with blood sucking, decomposition, internal parasitism, and putrefaction.

In the second half of the eighteenth century, Georges-Louis LeClerc, Comte de Buffon in France, and John Needham in Britain, had offered support for spontaneous generation. Buffon's *Histoire Naturelle* advanced a form of spontaneous generation with a cycling of 'organic molecules' that were released from an organism following death and reincorporated into new forms: '...organized beings are formed by the grouping of [organic parts], and reproduction and generation are therefore nothing but a change of form.'<sup>16</sup> These organic particles formed the 'interior mold' of all organisms and any superfluous particles were gathered in reservoirs: the ovaries and testes. When a body decomposed, the newly liberated organic molecules might form lowly organisms like worms and microorganisms if they combined with brute particles in the environment. This would account for the spontaneous generation of earthworms and maggots. In a similar manner, if there were malfunctions in a living organism that prevented the assimilation of organic particles from food to the interior mold, these excess particles might combine with brute particles in the food to form organised bodies; Buffon believed 'this [to be] the origin of tapeworms, ascarids, flukes and all other worms which are born in the liver, stomach and intestines'.<sup>17</sup>

Part of the reason that the belief in the spontaneous generation of helminths persisted so long, despite the doctrine being disproved for other

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<sup>16</sup> G-L. de Buffon, *Histoire Naturelle, générale et particulière* 1<sup>st</sup> edn. (Paris, 1749) quoted in Farley, p.23.

<sup>17</sup> G-L. de Buffon, *Oeuvres complètes*, ed. M. Lamouroux (Paris, 1828) vol. 12 *Histoire générale des animaux*, quoted in Grove, p.39.

organisms, was due to the absence of knowledge concerning their lifecycles and transmission strategies. This lacuna posed a series of questions: How did intestinal worms come to be within the body? If produced externally how were they transmitted? Why did they have a limited geographical range? Being produced from eggs seemed unlikely, as humans seldom eat food contaminated with the faeces of another and do not eat each other. The localisation of different species of helminths in different parts of the world seemed incongruous with increasing global travel, and there seemed to be nothing to stop eggs from being carried to these different regions. As John Farley notes, their spontaneous generation from within seemed to offer the most satisfactory explanation for the distribution of parasites in man.<sup>18</sup> However wrong this supposition was, it was an idea with a long history that proved difficult to shake. Parasitic infestations were intimately bound up with morality debates—a connection that the spontaneous generation controversy served to perpetuate. Internal parasites, initially considered to be symptoms rather than causes of disease, were correlated with the host's moral and religious choices, a notion that persisted in the lay mind despite paradigmatic shifts in medical and scientific thought. As T. Spencer Cobbold writes as late as 1879, 'some [people] still cling to the creed that the presence of parasites, of internal ones at least, betoken evidence of Divine disfavour.'<sup>19</sup> This notion presupposed that internal parasites, particularly worms, were either generated spontaneously from diseased internal organs or resulted from a second fall from God's grace. The idea is exemplified in Ramesey's

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<sup>18</sup> John Farley, 'Parasites and the Germ Theory of Disease' *Framing Disease: Studies in Cultural History* eds. Charles E. Rosenberg and Janet Golden (New Brunswick: Rutgers University Press, 1992) pp.33-49 (pp.35-36).

<sup>19</sup> T. Spencer Cobbold, *Parasites: A Treatise on the Entozoa of Man and Animals including some account of the ectozoa* (London: J & A Churchhill, 1879) p.2.

assertion that we are preserved from innate destruction by God's care only and that being each already infested with 'numerous hosts of worms [...] He only prevents their devouring us.'<sup>20</sup> There is a tension here between infestation, morality, and death; if the host makes poor moral choices, God will remove His protection and so internal parasites will overwhelm the host body.

Such religious frameworks for parasite origin engaged with the related discourses of evolution and degeneration in the latter half of the nineteenth century to inform literary explorations of the parasite-host relationship. Texts such as Stevenson's 'Strange Case of Dr Jekyll and Mr Hyde' (1886) depicted visceral and mental subjugations of the host that might be seen as metaphorical explorations of the parasite-host relationship. The physical deterioration of Jekyll reflects the power of the parasite over the host body, while his moral transgressions and apparent willingness to surrender mark the infested body as a contested locus of identity. This text poses questions concerning the extent to which the infested body was a heteronomous space and suggests that a moral lacuna might invite the parasite in, or indeed inspire its genesis. At the turn of the century, British literary culture was still producing fiction that conceptually linked the helminthic parasite with religion, as might be seen in George MacDonald's *Lilith, A Romance* (1895), and with moral transgression, as might be seen in Stevenson's 'Strange Case of Dr. Jekyll and Mr. Hyde'. In this chapter, I will chart the origins of parasitology by investigating its sister discipline, helminthology, and exploring the significance of parasitic worms to popular and professional conceptions of selfhood.

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<sup>20</sup> Ramesey, *Dissertation*, pp.119. Ramesey also writes that intestinal worms are 'God's army, God's great army, which he uses both as a blessing and a punishment,' reinforcing the moral stigma that Cobbold laments in his 1879 treatise on helminths.

## **Worms, Worms, Worms of all Kinds! Numeric Anxiety and the Cultural Obsession with Helminths.**

As F. E. G. Cox demonstrates, advancements in helminthological study in the nineteenth century, such as the elucidation of parasite life cycles, the discovery of the alternation of generations, and more detailed descriptions of the anatomy of nematode worms, increased the cultural visibility of Helminthology as a science.<sup>21</sup> Worms in all their forms became a preoccupation for pathologists, the daily press, even for medical advertisements, and all of these outlets raised questions about the nature and origins of parasitic organisms. Despite experiments in the mid-century that proved that parasitic worms were produced from ova, the possibility of the spontaneous generation of parasites was still entertained by some scientists, more often than not re-couched in favour of protozoans and bacteria. The possibility in regard to higher parasitic organisms was supported by Dr. Henry Charles Bastian, professor of pathological anatomy at University College London, who claimed in 1872 that 'the truth of such new facts [did] not veto the possibility of the occasional independent heterogenetic origin of some of these organisms'.<sup>22</sup> The retention of this possibility kept alive anxieties about the production of parasites from within as a response to host behaviour. The parasitic worm and its free-living counterparts were reawakened in the popular imagination in this period as markers of disease; their origins were popularly debated and still given moral overtones.

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<sup>21</sup> F.E.G. Cox, 'History of Human Parasitology' *Clinical Microbiology Review* 15(2002)4 pp.595-608.

<sup>22</sup> H. Charlton Bastian, 'Remarks on Heterogenesis in Its Relations to Certain Parasitic Diseases' *British Medical Journal* 1(1872)582 pp.201-203. (p201).

The presence of helminths in everyday life was a constant reality for the general public whether infested with them or not. Myriad quack-doctor remedies boasted miracle cures to cleanse the body and rid it of worms; from herbal vermifuges to tapeworm 'traps' these medical advertisements profited on quick-fix treatments and largely useless prophylaxis. Many were ineffective, some even harmful. Patented panaceas like 'Holloway's Pills' boasted the ability to 'purify the blood', 'strengthen the stomach', and rid the body of, among many other ailments, 'worms of all kinds'.<sup>23</sup> Treating everything from gout to sore throat, the pills covered a vast number of everyday illnesses and worms were designated as part of this domestic pathology. However, Holloway's Pills were celebrated as a 'world-wide' enterprise and also offered ointments that purported to cure more exotic illnesses including 'bites of mosquitoes and sandflies' and 'elephantiasis'—a tropical disease caused by the parasitic filarial worm *Wuchereria bancrofti*. This reflects a dual cultural understanding of the parasitic helminth: as the intestinal saboteur of the English, common in children and paired with fluctuations in appetite and energy, and as the more subversive 'tropical' helminth, riddling the visitors to colonial environments with its inevitable and 'foreign' infiltration. These advertisements were accompanied by a view of a ship, evoking a colonial backdrop and reinforcing the tagline 'used by millions all over the world'.<sup>24</sup> This indicates both an awareness of these 'other' worms and the suggestion that a different ointment is required, differentiating the English from the Tropical helminth—a demarcation supported, in scientific and popular treatise, by the

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<sup>23</sup> Thomas Holloway, 'Health and Cheerfulness, Philosophy & Fact. Holloway's Pills', 25 March 1864, advertisement reproduced online: <<http://web.uvic.ca/vv/student/medicine/holloway.htm#>> [accessed 22 March 2016].

<sup>24</sup> See Appendix 2 for image.

prioritisation of the 'tropical' over helminthic nature of ascariasis and ankylostomiasis.<sup>25</sup>

Holloway's ointment often came in medicinal pots that featured a woman: Hygeia, the Greek goddess of Health, sitting with a child: her baby brother Telesphorus, demi-god of convalescence.<sup>26</sup> Beside her is a snake coiled around a pillar that drinks from the glass in her unobserved right hand. Attempts to interpret this image are of course speculative; however, the presence of the snake sipping from her glass suggests to me a clear representation of parasitism, the literal 'eating at another's table' or in this case drinking from another's cup. Perhaps it alludes to the Fall described in Genesis—the manipulation of Eve by the serpent here representative of human susceptibility to corruption (disease)—or perhaps to the rod of Asclepius or Moses' brass snake staff, symbols already suggested to represent parasitic disease by Küchenmeister in the 1850s.<sup>27</sup> Küchenmeister suggested that the image of the snake curled around a staff, which Moses used to cure the Israelites of their 'fiery serpents' was a reference to the treatment for guinea worm (or dracunculiasis),<sup>28</sup> which involved removing the parasite by curling it around a pole or stick. These interpretations (which place the snake as representative of disease) appear to be upheld by another pot of medicinal ointment bearing the name 'The Great Healer, Reekie's Ointment', probably produced by Thomas Reekie in the late nineteenth century, which bore

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<sup>25</sup> For definitions of these terms see Glossary of Terms.

<sup>26</sup> See Appendix 2 for image.

<sup>27</sup> See Friedrich Küchenmeister, *On Animal and Vegetable Parasites of the Human Body: A Manual of their Natural History, Diagnosis, and Treatment* trans. Edwin Lankester vol.1. (London: Sydenham Society, 1857) pp.390-95.

Risdon Bennett, *The Diseases of the Bible* (London: The Religious Tract Society, 1887) pp.133-138.

<sup>28</sup> See Glossary of Terms for definition.



the image of a woman standing triumphantly on top of a snake, flexing her muscles, as a sign of health.<sup>29</sup> Although these ointments are often marketed as panaceas, treating a range of illnesses and improving health more generally, the presence of the snake appears to make this conceptual link with parasitic disease.

This connection again reinforces the morality narrative that accompanied parasitology, the snake being a pertinent symbol for biblical sin. This tripartite symbolic relationship: snake, parasite, and sin, was in fact an historically engrained cultural idea that long preceded parasitology and helminthology as formal or informal disciplines. Ancient Greek historian Plutarch recorded the popular belief that snakes were engendered from the marrow of the spines of wicked men.<sup>30</sup> This was likely an oblique reference to the presence of parasitic worms in the body and their supposed indication of host transgression. Cobbold too recognised this long cultural association in his reading of parasitic disease in passages from the Bible. He asserted, like Küchenmeister, that 'there can be no doubt that the "fiery serpents" which afflicted the children of Israel during their stay in the neighbourhood of the Red Sea were neither more nor less than examples of our *Dracunculus*.'<sup>31</sup> This connects a parasitic disease, dracunculiasis, with a biblical punishment, suggesting that in biblical times religious transgression was used to explain the presence of parasites in the body, or more significantly, that in the nineteenth century biblical punishment was being re-read as the recording of an epidemiological reality.

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<sup>29</sup> See Appendix 2 for image.

<sup>30</sup> McCartney, 'Spontaneous Generation and Kindred Notions in Antiquity', p.110.

<sup>31</sup> Cobbold, *Parasites: A Treatise on the Entozoa of Man and Animals*, p.217.

When Cobbold was writing, in the nineteenth century, medical practitioners no longer associated infestation with host immorality. However, the oral transmission routes of many parasites provided scope to retain these ethical judgements. Propagated by poor personal hygiene, insanitary living conditions, and eating undercooked meat, parasites were associated with poor life choices (as well as poverty) and so although now considered an external danger rather than an internal judgement, they were still associated obliquely with host behaviour. In the mid-century, Francois-Vincent Raspail, author of 'The Yearly Hand-book of Health' warned: 'Mothers, feed not your children upon sweets, biscuits and mucilages. They feed not them, but ascarides, parasites instead'.<sup>32</sup> This advice reframed the moral judgement previously associated with 'spontaneously generated' parasites, as a judgement on the life choices of those who had an unhealthy diet.

Throughout the nineteenth century, helminthology gained cultural visibility through its engagements with the general public in advertisements like those outlined above and pamphlets offering health advice for families. In such pamphlets, the suggested treatments for dispelling helminths involved swallowing a concoction daily and awaiting the expulsion with bowel movements. The 1835 edition of the family medicine prescription book 'Every Man his Own Doctor' lists several entries for the treatment of worms. Under 'tape worms' it suggests mixing 'a spoon full of Norway tar in a pint of small beer' and boasts that this can expel a

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<sup>32</sup> Francois Vincent quoted in 'Doctoring Begins at Home' *Harper's New Monthly Magazine* 11(1855)65 pp.673-676. (p.676).

tapeworm 'thirty-six feet in length'!<sup>33</sup> To kill 'worms in the body' it suggests 'half a glass full of brandy, and as much fine sulphur as will cover a shilling', together with a blackened bread crust. Further treatments include quicksilver with sulphur, jalap, and honey, or for children: calomel, rhubarb and treacle. One worm powder boasts to have been 'long kept secret abroad' but now 'made public for the benefit of mankind'.<sup>34</sup> These anti-helminthics seem to have a common pattern: a purging agent like sulphur or calomel (mercury chloride) together with a palatable medium like beer or honey. They are all to be taken early in the morning and often after fasting. The association with worms and the digestive system here is clear; however, the worms' origins were not clearly defined in these prescriptions and advertisements. At the beginning of the century, worms were still prime candidates for spontaneous generation, an idea perpetuated by over-the-counter medicines; in 1803, 'Dr Gardener's Pills' for roundworm asserted that roundworms '[were] commonly engendered and found in the stomach and frequently come off at the mouth',<sup>35</sup> the word 'engendered' supporting a spontaneous generation. These sorts of medical advertisements perpetuated debates surrounding the origins of parasitic worms in the public sphere. John Farley notes the significance of two key discoveries in the nineteenth century: the alternation of generations by Japetus Steenstrup in the 1840s and the discovery that what were commonly called 'bladder worms' were in fact juvenile forms of tapeworms, by Friedrich Küchenmeister, Carl von Siebold, and Pierre-Joseph van

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<sup>33</sup> J. Pidduck, *The Housekeeper's Guide; or, Every Man His Own Doctor; Containing Many Valuable Recipes and Prescriptions (Approved of by the Most Eminent Physicians) for the Cure of the Human Body, &c.* 4th edn. (Leeds: W.W. Robinson & Son, 1835) n.p.

<sup>34</sup> Pidduck, *Every Man His Own Doctor*, n.p.

<sup>35</sup> John Gardiner, 'Roundworms' *The Morning Post*, 18 August 1803. n.p.

Beneden in the 1850s.<sup>36</sup> These discoveries established that parasites had complex life cycles and could change, not only their host, but also their form. By elucidating parasite life cycles these discoveries also proved that such organisms did not arise spontaneously within the host, but rather were transmitted by the ingestion of eggs. Thus in the latter half of the nineteenth century, parasitic worms were increasingly couched as external threats in medical and popular discourse. That being said, the notion that parasitic worms were internal saboteurs produced by, and reactive to, the host body, persisted in the cultural imagination and was reframed in psychological explorations of selfhood. The popular connections between helminths and terrestrial worms added symbolic layers to the parasitic worm.

Since ancient times, the worm had been a cultural symbol associated with disease and with consumption. Blame had been placed erroneously on worms for a variety of ailments—such as the misleadingly named ring-worm (the supposed cause of dermatophytosis) and the fictitious tooth-worm (the supposed cause of tooth ache)—sometimes understood as themselves pathogenic, other times interpreted as symptoms of pathology. Worms were also blamed for the destruction of libraries: enter the longstanding myth of the book-worm. These imagined worms (ringworm is caused by a fungus, but resembles a worm in shape, whilst the tooth-worm and book-worm are fabricated organisms

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<sup>36</sup> John Farley, 'Parasites and the Germ Theory of Disease' *Framing Disease* eds. Charles E. Rosenberg and Janet Golden (New Brunswick: Rutgers University Press, 1992) pp.33-49. (pp.36-38).

attributable to other sources),<sup>37</sup> can be explained by misleading observations and mistaken correlations based on tenacious cultural ideas about worms as destructive organisms. The tooth-worm, a theory for explaining dental caries reported by Guy de Chauliac in the 1300s and alluded to in cuneiform tablets, was thought to gnaw holes in human teeth. In the eighteenth century, father of microscopy,<sup>38</sup> Antonie van Leeuwenhoek was sent 3 such worms (one alive, two dead), purporting to be 'tooth-worms' taken from an extracted tooth, by Sir Hans Sloane, president of the Royal College of Physicians. Upon closer inspection, van Leeuwenhoek identified them as 'cheese worms', noting their similarity to the maggots found in cheese, which he correctly attributed to small flies that lay their eggs in unattended food. He then bred the living 'tooth-worm' to find that it transformed into a small fly of the same species as maggots acquired from a cheese-monger. He thus concluded that the 'tooth-worms' had entered the recipient's tooth during their consumption of old cheese (as maggots or as eggs) and that these 'worms' had lodged within a cavity in the tooth. While this elucidation appears to dispel the tooth-worm theory of dental decay, van Leeuwenhoek does suggest that from their tooth cavity these worms 'began to gnaw' and 'must [have] cause[d] great pain' perpetuating the notion that they might still be a legitimate cause for toothache.<sup>39</sup> As I. D. Mandel notes, the theory of the tooth worm, originally thought to be a demon in the form of a worm, had

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<sup>37</sup> Whilst insects that destroy books do exist, I would argue that there is not a specific 'book-worm', rather that it is a culturally constructed organism with a contested and colourful history, traceable to a variety of wood and paper devouring insects.

<sup>38</sup> With his handcrafted microscope, van Leeuwenhoek, a Dutch scientist and lens grinder, was the first to observe and describe single-cell organisms, which he called 'animalcules'.

<sup>39</sup> Antonie van Leeuwenhoek, *The Selected Works of Antony Van Leeuwenhoek, containing his Microscopical Discoveries in many of the works of Nature* trans. Samuel Hoole (London: G. Sidney, 1880) p.120.

been independently recorded in a variety of diverse cultures,<sup>40</sup> probably owing to the 'gnawing' pain of toothache and isolated instances of fly larvae being transferred to the mouth from spoiled food, as recorded by Van Leeuwenhoek.<sup>41</sup> However, the tooth-worm as the cause of dental decay, often thought to be engendered in the mouth, was contested by many scholars, notably by Ambroise Paré and Pierre Fauchard, who advanced a theory of internal inflammation,<sup>42</sup> supported by John Hunter in 1778, and Thomas Bell in 1831. As more advanced theories for dental decay came into favour and the microscope became the staple of scientific research, the tooth-worm began to decline in popularity, replaced by the image of gnawing bacteria.<sup>43</sup>

Our second destructive worm—the book-worm—had been recorded and embellished by writers for centuries, described by Aristotle as 'like a scorpion without a tail', by Byzantium grammarian Euenus as a 'black-fleshed worm', by German physician Christian Mentzelius as a 'grey-crested mite with crowing wings' and by Scottish poet Robert Burns as more like a maggot.<sup>44</sup> These differing descriptions serve to paint an almost mythical image of the rarely seen, but much talked about creature. As Eugene McCartney pointed out in 1920, Pliny, in *Naturalis Historia*, and Aristotle, in *Historia Animalium* had recorded the belief

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<sup>40</sup> I. D. Mandel, 'Caries Through the Ages: A Worm's Eye View' *Journal of Dental Research* 62(1983)8 pp.926-929. (pp.926-7).

<sup>41</sup> John D. Ruby, Charles F. Cox *et al.* suggest *D. medinensis* (guinea worm) might account for the tooth-worm myth in tropical countries; the gravid female can migrate to the head of the host whereupon the drinking of water stimulates the release of thousands of guinea worm larvae. John D. Ruby, Charles F. Cox, Neotake Akimoto, Nobuko Meada and Yasuko Momoi, 'The Caries Phenomenon: A Timeline of Witchcraft and Superstition to Opinions of the 1500s to Today's Science' *International Journal of Dentistry* (2010) pp.1-10. (p.2).

<sup>42</sup> Ruby, Cox Akimoto *et al.* 'The Caries Phenomenon', pp.2-3.

<sup>43</sup> Mandel, 'Caries Through the Ages', p.298. Although the tooth-worm was no longer considered an acceptable hypothesis, the elucidation of dental decay was far from confirmed; as late as 1920 an article in *Science Progress* suggested that the toothbrush itself might be the culprit! See: Ronald Ross, 'Toothbrushes – A Warning' *Science Progress*, 14(1920)55, pp.464-65.

<sup>44</sup> Jackson Holbrook, *The Anatomy of Bibliomania* (New York: Farrar Straus, 1950) pp.430-2.

that these insects were engendered from 'old wax [...] paper, damp dust and books.'<sup>45</sup> Vitruvius suggested that the generative force of the wind played a part in this process, 'let [not] the library face the south or west [...] because the winds from these directions give birth to book-worms (*Tineae*) and nourish them.'<sup>46</sup> *Tinea* is also the taxonomic name given to the disease ringworm, actually a fungal infection, but long-thought to be caused by a worm due to the characteristic rings formed on the skin of sufferers that resemble the imagined furrows of a sub-dermal worm.

These three examples articulate a long-standing cultural fascination with worms as perpetrators of destruction. As outlined previously, the experiments of Küchenmeister, Siebold, and Beneden in the mid-nineteenth century provided the final nail in the coffin for the theory of spontaneous generation and in the process framed disease as an external threat. Francois Vincent Raspail, writing in the 1850s, supported this by asserting that 'the causes of disease are [...] external: illness, in the first instance, attacks us from without, and does not emanate from ourselves.'<sup>47</sup> The editor of *Harper's New Monthly Magazine*, in reviewing the work of Raspail, reported on the causes of disease, listing external and internal parasites as prime offenders; 'especially intestinal worms [which] seize on the infant in the cradle, and often adhere to man through life, quitting him only in the grave, where they hand him over to other worms.'<sup>48</sup> The word 'seize' corroborates Raspail's assertion that all diseases (including those caused by parasites) originate externally. The confirmation of worms as external

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<sup>45</sup> McCartney, pp.104-5.

<sup>46</sup> McCartney, p.111.

<sup>47</sup> 'Doctoring Begins at Home', p.674.

<sup>48</sup> 'Doctoring Begins at Home', p.674.

infestations, rather than internal creations, was widely accepted by the late century, but with this confirmation came the realisation that they were, as an advertisement for 'Mother Graves' Worm Exterminator' in 1887 put it, 'no respecters of persons—the rich and poor, the proud and humble alike have to seek relief from their ravages.'<sup>49</sup> The universality of disease, particularly parasitic disease, was made more unsavoury by the cultural associations between worms and decay; the presence of these organisms within the body demarcated an infestation usually only seen in decomposing corpses and ultimately represented the breaching of bodily integrity. In addition, increasingly empirical interpretations of morbidity led to the emergence of infestation 'thresholds', which imaginatively associated pathology with numeric abundance. The surpassing of this threshold was described in *The Edinburgh Evening News* of 1880, in an article detailing a post-mortem examination, alarmingly titled 'Devoured by Parasites':

The entire system was impregnated with the parasites; the muscles and tissues of every part of the body, except the heart were filled with them. They were smaller than grains of the finest sand, but under a good microscope, they looked like earthworms rolled up into coils. It was roughly estimated that there were no less than 50,000,000 trichinae in the whole body.<sup>50</sup>

This narrative perpetuated the inclusive use of the term 'worms', in addition to focusing the reader's attention on a numeric infestation in an account that again

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<sup>49</sup> 'Mother Graves' Worm Exterminator' *Northrop & Lyman Co's Family Recipe Book and Guide to Health* (Toronto: Northrop & Lyman, 1879) p.20.

<sup>50</sup> 'Devoured by Parasites' *Edinburgh Evening News*, Friday 31 December 1880, p.3.



recalls Ramesey's fantasy of a fully infiltrated body. Reports of tropical diseases like elephantiasis, ascariasis, and malaria would also focus on the numbers observable in the blood or digestive system. It is interesting to note that cases of Trichinosis (as described in the newspaper excerpt) are correctly attributed to the consumption of undercooked meat, whilst tropical helminthic diseases are more often than not associated instead with the colonial landscape. This compounds my earlier observation in regard to the overtly tropical framing of ascariasis and ankylostomiasis and the emergence of a dual understanding of the parasitic helminth.

Parasitologists like Sir Ronald Ross, Captain Leonard Rogers, and Surgeon-major Giles all published papers on malaria, ankylostomiasis, and kala-azar that prioritised mathematics and population number in theories of infection. Ross wrote in 1897:

For the last seventeen years it has been known that malarial fevers are due to a microscopical animal parasite called the *haemamoeba malariae*, which occupies and destroys the red corpuscles of the blood. The mischief these minute creatures can effect in the system of patients may be gauged from the fact that they may number a quarter of a billion in one person at one time, and that new generations of them appear with every fresh attack of fever and consume more and more of the constituents of the blood.<sup>51</sup>

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<sup>51</sup> London, LSHTM. RC. Ross/43/24. Pamphlet for the United Planters' Association of Southern India, Madras. (1897).

Their numeric significance is evident here and understood as the root of their 'mischief'. Ross places a similar importance on numbers when considering helminths:

Now consider the familiar case of the benign worms: tape worms, round worms, thread worms, whip worms; how exceedingly common it is to find these in so-called healthy persons [...] As a matter of fact it is a common observation to find that they do cause mischief when in large numbers. Or, consider the more malignant worms, *ankylostoma*, *filaria bancrofti*, *bilharzia* nothing is easier to conceive than that a few of these may be almost harmless, whereas a large number may, must and does cause even death.<sup>52</sup>

The notion of a pathological threshold is overt. He places ultimate fault, not with the presence of the parasitic organisms alone, but with their proliferation inside the host and with their domination of the host body. So-called benign worms, which are common in healthy persons in small numbers, might still become pathological when present in crowds. Likewise, so-called 'malignant' specimens are 'almost harmless' when restricted to a solitary few. Ross's detailed recording of statistics in his research notebooks compounds this mode of thinking. In a post-mortem report of a ten-year-old child, called Bhad Katoni, he found 102 ankylostoma, whilst in another 23-year-old patient, he found 7 ankylostoma and 3 roundworms. In his patient records he summarised other patient examinations

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<sup>52</sup> London, LSHTM. RC. Ross/43/21. MS entitled: 'Notes on some animal parasites in India' (1896).

as: '7 ankys', '14 ankys', '500 ankys', '200 ankys', '20 ankys and 300 flukes'.<sup>53</sup> The recording of precise numbers is prioritised, reflecting a mathematical approach to disease—indeed later Ross would publish on the mathematics of immunity and develop a mathematical theorem for predicting epidemics.<sup>54</sup>

These debates concerning the precise nature, transmission, and pathological potential of the helminth in the latter half of the nineteenth century raised the profile of the parasitic worm in the public sphere. Cultural ideas about worms already present in the popular imagination interacted with these empirical recordings of worms apparently jostling for somatic supremacy and framed them as prime candidates for fictional exploration. I argue that late-nineteenth-century authors explored the imagined power play between parasite and host, offering symbolic renderings of this relationship embedded within narratives that renegotiate psychic and somatic boundaries. The long-standing superstitious, moral, and biological discourses associated with the parasitic helminth—proven and disproven—interacted with the cultural zeitgeist of the late nineteenth century to produce a unique fictional framework for exploring psychological identity. In the following section I will outline the intersections between Christian theology and the spontaneous generation debate in order to demonstrate the kinds of associations that framed parasitic infestations, associations that—although no longer biologically valid—were still invoked in the late nineteenth century by literary authors to bolster their fictional explorations

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<sup>53</sup> See: London, LSHTM. RC. Ross/29/94. Research Notes.

<sup>54</sup> See: Edwin R. Nye and Mary E. Gibson, *Ronald Ross: Malariologist and Polymath, A Biography* (London: Macmillan, 1997) pp.242-49. See also: London, LSHTM. RC. Ross/16/04. Ross to George Nuttall. A letter in which he invites Ross to stay with him at his home and discuss the mathematical basis for immunity.

of psycho-somatic identity.

### **In the Beginning Was the Worm: Helminthological and Religious Considerations in the Spontaneous Generation Debate.**

'In the beginning was the Word and the Word was with God and the Word was God.'<sup>55</sup>

The largest objection to the theory that parasitic worms were generated spontaneously came not from science, but from theology. Although this objection occurred principally in the seventeenth and eighteenth centuries, a religious element to spontaneous generation discourse persisted well into the nineteenth, as identified by T. Spencer Cobbold, and noted earlier in this chapter. These interactions between Christianity and natural history provided the foundation for the nineteenth-century fictional explorations I will analyse in this chapter. Although no longer a valid biological explanation in this period, spontaneous generation provided literary authors with a fitting mechanism to bolster the imaginative application of the parasite-host relationship to the human psyche. By outlining the history of the spontaneous generation debate in more detail, I will account for the theory's associations with moral transgression and its particular significance in relation to parasitic worms. As I will argue, the intertwining of religious and biological discourse had much significance for explorations of mental and physical selfhood in the late nineteenth century.

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<sup>55</sup> *The Bible: Authorised King James Version with Apocrypha* eds. Robert Carroll and Stephen Prickett. (Oxford: Oxford University Press, 2008) John 1:1, p.114.

Parasitic worms posed a particular problem for opponents of the spontaneous generation theory. Prior to the elucidation of parasitic life cycles (including their development into adult form within the host), helminthic parasites really did appear to arise fully formed inside man. However, opponents of the spontaneous generation theory could not accept the theological implications of such a suggestion.<sup>56</sup> English parson-naturalist John Ray wrote in 1717: 'my observation and affirmation is, that there is no such thing in Nature, as unequivocal or spontaneous generation [nevertheless] no instance against this opinion doth so much puzzle me, as worms bred in the intestines of Man, and other animals.'<sup>57</sup> This puzzlement continued for over a century and was only decisively put to bed by Pasteur's germ theory in the 1860s. Francesco Redi (1626-1697) and Antonie van Leeuwenhoek refuted the idea of spontaneous generation in relation to weevils and flies, and Edward Tyson (1650-1708), through anatomical observation, showed that *Ascariasis lumbricoides* comprised two genders and reproduced sexually. However, as Gordon C. Cook and David Grove point out, Tyson still believed that initial infestations began by the spontaneous generation of the original

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<sup>56</sup> Despite the catch-all label 'spontaneous generation', it should be noted that there was a distinction between *abiogenesis* or the generation of life from inorganic matter, and *heterogenesis/aequivocal generation* or the generation of life from organic matter. Supporters of spontaneous generation in the early nineteenth century, argued that algae, fungi, and infusorians arose from dead organic matter, whilst parasitic worms arose from living organic matter, i.e. within the host. See: John Farley, 'The Spontaneous Generation Controversy (1859-1880): British and German Reactions to the Problem of Abiogenesis' *Journal of the History of Biology* 5(1972)2 pp.285-319 (p.285).

<sup>57</sup> John Ray, *The Wisdom of God Manifested in the Works of Creation, in two parts viz. The Heavenly Bodies, Elements, Meteors, Fossils, Vegetables, Animals, (Beasts, Birds, Fishes, and Insects); more particularly in the Body of the Earth, its Figure, Motion, and Consistency; and in the admirable Structure of the Bodies of Man, and other Animals; as also in their Generation, &c. With Answers to Some Objections.* 7<sup>th</sup> edn. (London: Printed for R. Harbin, for William Innys at the Prince's Arms in St Paul's Church Yard, 1717) p.299, reproduced online by *The John Ray Initiative: Connecting Environment, Science and Christianity* at: <<http://www.jri.org.uk/ray/wisdom/>> [accessed 20 March 2016]

parasites,<sup>58</sup> and Redi likewise believed in the doctrine with regard to galls in plants and intestinal worms.<sup>59</sup>

Tension arose from the fact that although spontaneous generation was controversial, it seemed like the best explanation for parasitic entozoa. Some of this controversy came from the theological implications of the theory. The idea that new organisms might arise spontaneously in man directly contradicted Genesis, which taught that creation stopped on the seventh day. In response to this theological dilemma, theories of *pre-existence* became popular arguments for explaining spontaneous generation in the late seventeenth century. As Clara Correia notes, these theories proposed that organisms arose from the germ of preformed fundamental parts, which were designed by God and existed everywhere in life. Under the right conditions these germs, which contained the blueprints of every organism that had ever had—or ever would—exist, would grow into the corresponding organism.<sup>60</sup> This method of transmission or *emboîtement* offered a plausible and theologically acceptable explanation. Arising from these debates were the specific pre-existence theories of *Ovism*: that all organisms arose from eggs, and *Spermism*: that all organisms arose from sperm. These explanations sidestepped any theological dilemmas by suggesting that Adam (or Eve) contained all future progeny that would ever exist in their male and female testes. However, this still did not adequately explain the appearance of

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<sup>58</sup> Gordon C. Cook, 'History of Parasitology' in *Principles and Practice of Clinical Parasitology* eds. Stephen H. Gillespie and Richard D. Pearson (Chichester: John Wiley and Sons, 2001) pp.1-20 (pp.1-2).

<sup>59</sup> David Grove, *Tapeworms, Lice and Prions: A Compendium of Unpleasant Infections* (Oxford: Oxford University Press, 2014) p.9.

<sup>60</sup> Clara Pinto Correia, *The Ovary of Eve: Egg and Sperm and Preformation* (Chicago: University of Chicago Press, 1997) p.8.

parasitic worms within human bodies.

One explanation was that parasitic worms were passed from host to offspring with man himself in a kind of double *emboîtement*. This would mean that, for Spermists, Adam contained within him, not only all of mankind, but all of mankind's parasitic worms too! The problem with this was that man, created in innocence before the fall, was free of all diseases. The seven days of creation decreed that no new species could have been created after him, so even if helminths were inherited, their parasitic behaviour could not be explained. Italian physician and biologist Antonio Vallisneri (1661-1730) suggested that the worms might have originally served a beneficial purpose such as aids to digestion, and became parasitic only *after* the fall from grace: 'worms [which] God appointed to Man, while he preferred him in his first state of innocence, were to be useful to him and render his body more perfect'.<sup>61</sup> He went on to suggest an ordained symbiotic relationship in which Adam supported and fed 'those insects, which had a mind to live together quietly and friendly' who in turn would not 'transgress their bounds or eat holes thro' the sides of the guts [...] but they would rather, by gently licking the parts and by healing them, do their Host a kindly office.'<sup>62</sup> After the Fall however, the worms became 'Ministers of Divine justice', given 'leave to destroy and become a common Enemy of Mankind.'<sup>63</sup> The appellation

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<sup>61</sup> A. Vallisneri, *New Observations and Experiments Upon the Eggs of Worms Found in Humane Bodies* (London, 1713) quoted in Daniel LeClerc, *A Natural and Medicinal History of Worms: Bred in the Bodies of Men and Other Animals* trans J. Browne (London, Printed for J Wilcox at the Green Dragon, 1721) p.352.

<sup>62</sup> French medical writer Daniel LeClerc adds the suggestion that other parasites like lice might be explained in a similar manner: 'the Lice which we now seem to have such an abhorrence of [...] might [have been] very serviceable to [man], in gently opening the pores of the skin.' LeClerc, p.354.

<sup>63</sup> LeClerc, pp.352-3.

'Minsters of Divine justice' troublingly positions the parasitic worm as an extension of the hand of God, supporting the proposition that parasitic infestation was a Holy punishment for religious transgression.

This double *embroûtement* theory is where we begin to see a divergence in understandings of parasitic infestation. To account for the fact that not *all* humans were infested with worms, French medical writer Daniel LeClerc (1652-1728) suggested that these inherited worms might lay dormant within the body until the occurrence of 'a disposition or conveniency of Humours and Place, that was apt and proper to excite them to move'.<sup>64</sup> In other words, they would remain passive until a specific geographical location or bodily imbalance roused them into action. LeClerc offered support to the former notion by insisting that the 'pricking' and 'itching' of the skin (particularly the arms and legs) that one experiences when visiting the Coast of Guinea was indicative of 'the incipient motion of the Worm stirred up from the heat of that climate'.<sup>65</sup> This contributed to later climatic understandings of disease, which categorised whole continents as insalubrious, a paradigm that I will discuss at length in chapter three. The other conclusion is, although scientifically unsound, of much more critical interest.

The emphasis on internal predisposition, embodied in LeClerc's use of 'Humours', reiterates the moral codings already associated with parasitic

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<sup>64</sup> Daniel LeClerc, p.348.

<sup>65</sup> Daniel LeClerc, p.348. A prickling sensation in the arms and legs is indeed a symptom of dracunculiasis or guinea worm infestation, which is transmitted via contaminated drinking water. Being endemic to hot climates, the connection between heat and this disease is not an unwise jump, however the heat neither 'excites' worms already present in the host body, nor does it contribute directly to transmission.



organisms. LeClerc's humoural explanation for parasitic worms characterised the parasite as a threat from within, ever ready to be incited into action. In the early nineteenth century, debates surrounding the spontaneous generation of parasites continued to rage, and the host body's ability to apparently create parasitic organisms framed it as an imaginative space of monstrous generation. In 1824, the *Monthly Gazette of Health* published an article that forwarded the theory that the tubercles of pulmonary consumption (tuberculosis) were parasites with an independent life. They further insisted that cancerous tumours were parasites, a fact that they argued was 'admitted by every surgeon of experience and observation'. They stated similar claims of acceptance with regard to the spontaneous generation of parasites more generally, and argued that 'deposits of febrile or coagulated lymph, in cells of the lungs, may become parasitical animals'.<sup>66</sup> This heavily connected parasites with disease and continued the suggestion that parts of the host's own body may become independent pathogenic organisms. German zoologist Hermann Burmeister similarly argued that parasitic ectozoa, like lice, and entozoan, like worms, were generated spontaneously from bodily perspiration and lymphatic juice in his *Manual of Entomology* (published with English translation in 1836). This claim was discussed at length in *The Entomological Magazine* in the following year and re-immersed the spontaneous generation debate in the theological frameworks of the preceding century. The correspondent, J. Bn, criticised Burmeister's indictment of spontaneous generation, identifying it as

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<sup>66</sup> 'Of the Late Mr. Edward Grainger, Fellow of the Royal College of Surgeons, London; Lecturer on Anatomy; &c, &c, &c.' *The Monthly Gazette of Health; or Medical, Dietetic, and General Philosophical Journal* ed. Richard Reece, M.D. vol 4. No. 99 (London: Sherwood and Co, 1824) pp.829-31. (p.831).

a favourite argument 'for those who deny the superintendence of a Supreme Being over the material world', echoing the theological objections of the seventeenth and eighteenth centuries.<sup>67</sup> He pointedly avoided theological arguments in order to demonstrate how untenable the doctrine was from 'fully observed facts' and 'analogical reasoning', however concluded by highlighting its inconsistency with 'the true notions of a creative Being'.<sup>68</sup>

Embodied in the difference between parasites as external invaders or parasites as internal creations is the difference between them as separate, competing natural organisms, or as organisms borne of, and so connected to, the host's own organismal identity. The ability to apparently produce organisms *de novo* challenged the perceived authority of God as Divine creator and in addition challenged the boundaries of identity; where did the host end and the parasite begin? This tension was at the core of literary depictions of the parasite-host relationship, even after spontaneous generation had been universally discredited. The power of this relationship as a hermeneutic framework only grew at the end of the century, in the wake of increasing disciplinary specialisation. Sub-disciplines like parasitology, immunology, evolutionary biology, and psychoanalysis all sought to shed light on the concept of the self. Questions of host/parasite boundaries in parasitology; self/non-self divisions in immunology; the ontogenetic and phylogenetic histories of the human in evolutionary biology; and explorations of the psychosomatic basis of identity in psychoanalysis—and its related

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<sup>67</sup> J. Bn, 'Art. XLIX. Observations on Spontaneous or Equivocal Generation' *The Entomological Magazine* Vol 4. (London: R. Clay, 1837) pp.365-375. (p.366).

<sup>68</sup> J. Bn, p.374.

fields—were approached from a common desire to elucidate the human condition. In their interrogation of the boundaries of the self, these disciplines proffered multiple frameworks within which to understand identity. I argue that we can see the synthesis of some of these frameworks in the literary fiction of the fin de siècle. The use of the discourses of parasitism in these texts highlights the impact of parasitology on the cultural consciousness, and moreover, demonstrates its interconnections with other disciplines.

George MacDonald's 1895 novel, *Lilith, A Romance* explores these discourses in a direct dialogue with Judaism and Christianity. As Rolland Hein has demonstrated, MacDonald's novel tackles issues of death, truth, and redemption in a narrative that reflects both John Bunyan's Christian allegory in *The Pilgrim's Progress* and the Romantic pantheism of poets like Samuel Taylor Coleridge.<sup>69</sup> In his exploration of selfhood and Christian identity, MacDonald engages with the notions of subjective reality, original sin, and spiritual enlightenment, using parasitism as a model of behaviour to reject. His cerebral fantasy depicts the world as an externalisation of the psychological struggle with faith, invoking psychoanalytical models, and at the same time employing the hermeneutic frameworks of parasitology and evolutionary biology to discuss humanity's relationship to sin. In the rest of this section, I will read *Lilith* as a product of this fin de siècle moment, with MacDonald drawing on frameworks that did or would later characterise

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<sup>69</sup> See: Rolland Hein, *Christian Mythmakers: C.S. Lewis, Madeline L'Engle, J. R. R. Tolkien, George MacDonald, G.K. Chesterton, Charles Williams, Dante Alighieri, John Bunyan, Walter Wangerin, Robert Siegel, and Hannah Hurnard* (Eugene: Wipf and Stock, 1998) esp. pp.69-72.

evolutionary biology, embryology, and psychoanalysis in order to explore the concept of the self.

MacDonald explores the mind using distinctly biological frameworks and in doing so presents a rendering of identity that psychologises Christian faith. This interdisciplinary approach to exploring [Christian] selfhood, I argue, is mediated by anxieties regarding the biological and social parasite, which become, for MacDonald, motifs that represent the heterogeneous nature of human identity—embodying our struggle with immorality. MacDonald's use of these frameworks demonstrate these disciplines' common preoccupation with human identity and the extent to which these specialisms lent themselves to engagement with Christian theology, or perhaps the extent to which Christian theology underpinned these discipline's methodologies in the late nineteenth century.

*Lilith* might be seen as a rewriting of aggadah midrashic interpretations of the creation story, which explore the discrepancies between the two versions of female creation presented in *Genesis* 1 and 2. As Judith Baskin points out, these two versions teach in contradiction: that men and women were made equally by divine sanction, and that women were made from men as a secondary and subsequent event.<sup>70</sup> Midrashic literature explains these contradictory accounts by attributing the first creation story to Adam's first wife, Lilith, who was created from the earth along with Adam, and the second to Eve, who was created in Adam's likeness from his rib.

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<sup>70</sup> Judith R. Baskin, *Midrashic Women: Formations of the Feminine in Rabbinic Literature* (Waltham: Brandeis University Press, 2002) p.9.

According to the literature, Lilith absconded after refusing to submit to Adam's authority, and Eve was created in her place.<sup>71</sup> This creation story is upheld in MacDonald's narrative, which takes place in a parallel universe or dream world, where we follow sceptical protagonist Mr. Vane on a pilgrimage to find out his place in the universe and the identity of his 'true' self. Along the way he meets the childish Little People, the dim-witted Bags, Adam, Eve, Lilith, and a variety of anthropomorphic animals and plants. Throughout his journey of self-discovery, which is in truth a journey of religious discovery, Vane's understanding of identity is constantly evolving. MacDonald presents us with a version of selfhood that blurs the physical and the mental in what might be read as an exploration of the physiological basis of consciousness. By collapsing the boundaries between the body, the mind, and the built and natural environments, MacDonald is able to interrogate the self-fashioning of identity and ultimately challenge the authority of the conscious mind over the body. This is chiefly orchestrated through the placement of the dream world within a room in Vane's ancestral home, the building itself becoming a metaphor for the body.

Vane begins his journey by walking through a mirror in the garret of the house, which he describes as the 'brooding brain of the building'.<sup>72</sup> He continues this motif, characterising the room (and thus the otherworld in which the story takes place) as representative of his mind:

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<sup>71</sup> Christopher Witcombe, 'Eve and the Identity of Women' *Art History Resources* (Sweet Briar: Sweet Briar College, 2000) published online at: <<http://witcombe.sbc.edu/eve-women/>> (7. Eve & Lilith) [accessed 21 March 2016].

<sup>72</sup> George MacDonald, *Lilith, a romance* (1895; Radford: Wilder Publications, 2008) p.10.

"I know nothing of my own garret," I thought, "What is there to secure me against my own brain? Can I tell what it is even now generating? – what thought it may present me the next moment, the next month, or a year away? What is at the heart of my brain?"<sup>73</sup>

The placement of the dream world within Vane's ancestral garret symbolically engages with a variety of biogenetic discourses concerning psychic identity, as I will demonstrate. Mr Vane's desire to know what is 'at the heart of [his] brain' mirrors the late-century efforts of psychoanalysis to decode the unconscious. Indeed *Lilith* might be taken as a dream narrative ripe for psychoanalytical interrogation; just five years later, Sigmund Freud would publish *The Interpretation of Dreams* (1900), which explored the significance of dreams as reflections of psychic activity. MacDonald appears to recognise the symbolic power of dreams by infusing them with biblical allegory and using this dream-narrative to question the narrator's sense of objective reality: 'the terror that madness might be at hand laid hold upon me: must I henceforth place no confidence in my senses or my consciousness?'<sup>74</sup> The alternation of absurdity and 'reality' in this dream world compound the sense that the mental processing of Vane's bodily senses is unreliable, drawing further causative parallels between mind and body. He uses the natural world to query Vane's sense of objective reality by challenging accepted taxonomic hierarchies. Human characters transform into animal versions of themselves, and the landscape too suffers taxonomic reorientations, obfuscating the boundaries that supposedly structure the natural world. The respective

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<sup>73</sup> MacDonald, p.11.

<sup>74</sup> MacDonald, p.11.

mental capacities of children, adults, flora, and fauna are called into question and Vane's authority over the dream world—and thus his mind—is directly challenged.

The dynamic connections that MacDonald draws between the mental and physical worlds seem to represent attempts to reconcile psychoanalytical models of knowledge with biological ones. This is where the intellectual milieu of the second half of the nineteenth century is of critical significance. Darwin's evolutionary researches and Ernst Haeckel's biogenetic law were key backdrops against which MacDonald forged his novel, which might be read as an exploration of personal identity. This identity is, in part, a psychological identity and, in part, a spiritual one; the result is a model of psychic identity that bears similarities to Freud's psychoanalytic understanding of the unconscious. Frank Sulloway has argued that Freud's early psychoanalytic theories were underpinned by a fusion of psychological and biological knowledge, heavily influenced by Charles Darwin's attempts to apply the fruits of his own evolutionary researches to child psychology.<sup>75</sup> Part of Darwin's evolutionary work charted the mental continuity between animals and man, leading him to publish *A Biological Sketch of an Infant* in 1877, which attempted to trace the development of the mind (including emotional intelligence, reasoning capacity and moral integrity) in a child. G. Stanley Hall, founder of the American Psychological Association, championed Darwin's notion of inherited emotions and fears (which Freud would later expand into an inherited knowledge or schema) inspired by the biogenetic notion that

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<sup>75</sup> Frank Sulloway, *Freud, Biologist of the Mind: Beyond the Psychoanalytic Legend* (Cambridge: Harvard University Press, 1992)

ontology recapitulates phylogeny, or that the embryological development of an organism emulates the phylogenetic evolution of that species.

The biological, and distinctly ontogenetic, discourses that would inform Freud's understanding of the mind might also be read in MacDonald's narrative. The notion of inherited knowledge, which would also inform Carl Jung's archetypes, is expressed in *Lilith* as the encapsulation of the (religious) history of creation in the mind of the protagonist. Thus rather than seeing the evolutionary history of a species encapsulated in a single organism's embryological development—or as Freud would later theorise: the psychological history in an organism's mental development—we see the biblical history of mankind encapsulated in Vane's spiritual development. MacDonald overlays this with parasitic imagery, which takes on symbolic meaning in light of the parasite's long cultural association with immorality and Divine disfavour.

The 'ontogeny recapitulates phylogeny' dogma is used here as an interpretive framework to unite these seemingly disparate discourses: namely theology, parasitology, and psychology. German biologist Ernst Haeckel's biogenetic law forwarded a notion of inheritance based on a shared evolutionary ancestry that was played out in the ontogenetic development of all individuals, so that remnants of the more primitive aspects of the species might be seen in the development of its 'modern' descendants.<sup>76</sup> In a

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<sup>76</sup> E. Ray Lankester recognises this same parallel in his *Degeneration: A Chapter in Darwinism* (London: Macmillan and Co, 1880): '...the phases of development or growth in the young are a brief recapitulation of the phases of form through which the ancestors of the young creature have passed [...] we find here and there in these histories of growth from the egg most valuable assistance in the attempt to reconstruct the genealogical tree.' (pp.21-22).



rediscovered essay, entitled 'A Phylogenetic Phantasy', Freud explores this idea in relation to the evolution of the mind.<sup>77</sup> He suggests that each developing child undergoes the mental evolution of its ancestors, mental complexity correlating with physical maturity. He posits the theory that those with mental disorders have regressed to a state representing an earlier stage in mental evolution, concluding that 'each individual contains somewhere within himself or herself the history of all mankind'.<sup>78</sup> This is a notion embodied in the double embroûtement theory of parasitic transmission and in MacDonald's *Lilith*, the protagonist of which relives the consequences of the Biblical Fall as a mental experience. MacDonald appropriates the embryological connection between the development of the individual and the development of the species, just as proponents of psychoanalysis, like Freud and Ferenczi did. The connection it provided between the present and the past, between civilization and primitiveness, between humanity and 'simple globule[s] of protoplasm',<sup>79</sup> provided a compelling framework for exploring psychological and spiritual selfhood, and in the process expressed anxieties concerning man's place in the natural world and his perceived vulnerability to evolutionary throwbacks. This is something at the forefront of many late-nineteenth century novels, such as H. G. Wells' *The War of the Worlds* (1898), which will be discussed in Chapter Four, and Robert Louis Stevenson's

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<sup>77</sup> In 1983, when looking through the papers of Freud's Hungarian student and colleague Sándor Ferenczi, Ilse Grubrich-Simitis discovered this previously lost essay—identified as the draft of Freud's twelfth meta-psychological paper, probably written during the First World War (at least during or prior to 1915).

<sup>78</sup> Sigmund Freud, *A Phylogenetic Fantasy: Overview of the Transference Neuroses* ed. Ilse Grubrich-Simitis, trans. Axel Hoffer and Peter T. Hoffer (Cambridge: Harvard University Press, 1987) p.xii.

<sup>79</sup> Ernst Haeckel, *Last Words on Evolution: A Popular Retrospect and Summary* trans. Joseph McCabe (New York: Peter Eckler, 1905) p.33.' Each of us was, at the beginning of his existence, a simple globule of protoplasm, surrounded by a membrane about 1/20<sup>th</sup> of an inch in diameter, with a firmer nucleus inside it.'

'Strange Case of Dr Jekyll and Mr Hyde' (1887), which will be discussed later in this chapter.

The interest in these connections for MacDonald can be traced along parallel lines: in the psychoanalytic interest in the development of the psyche and the theological interest in the development of moral consciousness. In order to reconcile these lines of inquiry, MacDonald interrogates the boundaries between humans and animals, querying the privileged position of the human soul. This process involved reimagining the soul along more physiological lines. In *The Evolution of Man* (1905), Haeckel suggested that the soul was simply a function of material anatomy and furthermore that it was shared with man's animal ancestors: 'the human soul—a physiological function of the brain—is in reality only a more advanced ape-soul.'<sup>80</sup> This suggested that the soul was inherited and genetically determined. He went on to argue that the 'psychic life of the whole human race' had evolved from 'the lower vertebrate soul', using comparative embryology to assert that the soul not only underwent a species-wide evolution, but that it also evolved in each individual over the course of their lifetime:

The gradual unfolding of the soul of the child is [...] so wonderful and glorious a phenomenon [...] it is only our manuals of psychology that know nothing of this development [...] the human soul as described in most of our psychological works, is merely the soul of a learned philosopher, who has read a great many books, but knows nothing of

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<sup>80</sup> Ernst Haeckel, *The Evolution of Man: A Popular Scientific Study* vol 2. (New York: P. G. Putnam, 1905) p.611.

evolution, never even reflecting that his own soul has had a development.<sup>81</sup>

MacDonald too expresses the idea that the soul unfolds in the growing child; he asserts that in a very young child 'conscience is not yet awake.'<sup>82</sup> Haeckel's insistence that new-born children have 'no consciousness, no knowledge of [them]sel[ves]'<sup>83</sup> is paralleled in MacDonald's understanding of self-awareness in *A Dish of Orts* (1893): 'By slow, inappreciable, indivisible accretion and unfolding, [the child] is lifted, floated, drifted on towards the face of the awful mirror in which he must encounter his first foe—must front himself.'<sup>84</sup> Despite his age, this confrontation of the self is what Mr. Vane must do on his journey of redemption. The significance of the mirror in this passage is made literal in the novel when Vane steps through it into his own consciousness. MacDonald's uses of evolutionary and embryological models to better understand psychological identity play out the tension between the competing psychological and biological discourses that underpinned selfhood. In Darwin, Haeckel, and Freud, we can perceive ideological similarities in regard to identity that reflect the emergence of psychobiology; in 1890 William James in his *Principles of Psychology* had asserted that 'the essence of mental life and of bodily life are one', and advocated a more holistic approach to psychological study.<sup>85</sup> However, James rejected the associationist and spiritualist theories that attempted to explain the source of psychic life (such as the Soul, or 'a

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<sup>81</sup> Haeckel, *The Evolution of Man*, p.875.

<sup>82</sup> George MacDonald, 'A Sketch of Individual Development' (1880) in *A Dish of Orts* (1893; Charleston: Bibliobazaar, 2007) pp.44-67. (p.45).

<sup>83</sup> Haeckel, *The Evolution of Man*, p.875.

<sup>84</sup> MacDonald, 'A Sketch of Individual Development' p.45.

<sup>85</sup> William James, *The Principles of Psychology* vol. 1. (New York: Henry Holt, 1890) p.6.

transcendental Ego') as 'metaphysical'.<sup>86</sup> MacDonald's novel, written five years later, works to reconcile these psychobiological frameworks with spiritualism.

The beginnings of this project might be seen in an earlier essay that MacDonald wrote on the imagination, in which he depicted a mental schema similar to Freud's unconscious. In this essay, MacDonald argued that the imagination is what 'gives form to thought' and thus is 'likest to the prime operation of the power of God.'<sup>87</sup> Thus he positioned the creative powers of the mind within the frameworks of theology; he further asserted that the imagination of man was made in the image of the imagination of God and thus was a symbolic expression of God's divine creative powers. Mankind's imaginative creations are, for MacDonald, an inferior imitation of God's actual creations. In *Lilith*, he plays with this imitative parallel by having Vane generate physical forms directly from his psychic landscape. This psychic landscape is outlined in proto-Freudian terms—a foreshadowing that highlights the latency of these ideas in late-nineteenth century discourse. In his earlier essay, MacDonald had identified an 'unconscious portion of [Man's] nature', from which thought-forms originate, and declared that 'the individual, the man, can know and not know that it knows'—an idea suggestive of psychological theories of repression. He further described a 'dark portion of our being' (which I would argue is akin to the Id), which is lighted by the divine 'candle of our consciousness' or God's light, (which I would argue is akin to the superego). This framework clearly also underpins *Lilith*, producing

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<sup>86</sup> James, p.vi.

<sup>87</sup> George MacDonald, 'The Imagination: its Function and its Culture' (1897) in *A Dish of Orts* (1893; Charleston: Bibliobazaar, 2007) pp.11-43. (p.12).

a narrative that interrogates the generative powers of the imagination in dialogue with anxieties about mental autonomy. In order to adequately position these psychobiological understandings of selfhood in relation to theological frameworks, MacDonald resurrected the creation anxieties that accompanied the spontaneous generation debate. He did this, I argue, through the use of parasitic imagery.

Marrying monsters, decay, and spiritual primitiveness in the same way that physicians married parasites, disease, and taxonomic simplicity, MacDonald illustrates the creation of bad thought-forms as a product of spiritual impurity. When Vane enters the Bad Burrow, he encounters monstrous creatures—engendered from the landscape—which symbolise his own ignoble thoughts. This encounter is an imaginative exploration of the mental schema outlined in MacDonald's essay, in which God is given a function akin to the superego and posited as a safeguard against the dangers of the unconscious mind:

If the dark portion of our own being were the origin of our imaginations, we might well fear the apparition of such monsters as would be generated in the sickness of a decay which could never feel—only declare—a slow return towards primeval chaos. But the Maker is our Light.<sup>88</sup>

This mental schema indicates a tension between the generative powers of the unconscious and the regulating powers of a moral code, or as MacDonald

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<sup>88</sup> MacDonald, 'The Imagination: Its Functions and its Culture' p. 30.

believes, the regulating powers of God. The notion that 'monsters' might be generated 'in the sickness of a decay' embodies rhetoric similar to that which characterised the spontaneous generation of parasites from decaying matter. The monsters that Vane encounters in the Bad Burrow represent bad thought-forms that directly threaten his safety:

I saw what seemed the ripple of an earthquake [...] a single wave rose up and came slowly toward me. A yard or two away it burst, and from it, with a scramble and a bound, issued an animal like a tiger. About his mouth and ears hung clots of mould, and his eyes winked and flamed as he rushed at me, showing his teeth in a soundless snarl.<sup>89</sup>

This monstrous generation is congruent with MacDonald's notion of a mind without divine light—the suggestion that we are within Vane's mind has already been established by his characterisation of the garret room. The 'clots of mould' which hang from the monster's face uphold the monster's origins as from the 'sickness of decay', while the ameliorating properties of the Maker's light are represented when Vane is saved by the light of the moon: 'her light controlled the monsters'.<sup>90</sup> MacDonald's use of 'mould' endows this description with a doubleness that further connects the apparitions to parasitic disease. As Charles Bastion had noted of heterogenesis in relation to parasitic diseases, it is by the various forms of mould that one can identify the presence of microorganisms and their spontaneous generation from dead

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<sup>89</sup> MacDonald, *Lilith*, p.40.

<sup>90</sup> MacDonald, *Lilith*, p.40.

matter.<sup>91</sup> Thus 'mould' here could be read as both compounding the monster's generation from the ground and as a signifier of pathology. MacDonald uses the imagery associated with the spontaneous generation of parasites to articulate his own understanding of the formation of immoral thoughts and their damaging qualities.

Vane not only recognises the fact of the monsters' creation from the landscape, but even participates in this creative process: 'I became at length so accustomed to their hurtled menaces that I fell to beguiling the way with the *invention* of monstrosities, never suspecting that I owed each moment of life to the staring moon.'<sup>92</sup> By making Vane complicit in his own danger, MacDonald interrogates the idea of mental autonomy. The monsters, generated from Vane's unconscious (the Bad Burrow), are controlled by 'God's light' (the moon), a dynamic that prevents Vane's own return to 'primeval chaos'.<sup>93</sup> His psychological complicity in this process is compounded by his unwitting allusion to his own imagination:

"That moon is affecting my brain," I said as I resumed my journey.

"What life can be here but the phantasmic—the stuff of which dreams are made? I am indeed walking in a vain show!"<sup>94</sup>

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<sup>91</sup> '...in all the parts of a dead organism appear the bursting forth into new life. Myriads of Bacteria and Fungus-germs are born from their parent fluids, although all is hidden from our ordinary view, and only becomes manifest when the ever varying forms of "mould" [...] appear and flourish upon the surface of the previous living aggregate.' H. Charlton Bastion, 'Remarks on Heterogenesis in its Relation to Certain Parasitic Diseases' *British Medical Journal* 1(1872)582 pp.201-03. (p.201).

<sup>92</sup> MacDonald, *Lilith*, p.40. [italics mine].

<sup>93</sup> A dynamic that MacDonald establishes in his essay on the imagination 'The Imagination: its Function and its Culture', discussed earlier.

<sup>94</sup> MacDonald, *Lilith*, p.40.

The pun on the word 'vain' exposes his chief vice, in addition to further situating the narrative within his unconscious mind. My contention that these monsters are produced from the unconscious is compounded by an earlier manuscript of the text, which noted that the ground is 'the out tissue of [Vane's] soul, the under-soil of the vineyard of [his] own being, deep in which, unknown to [himself] lay such nameless horrors.'<sup>95</sup> The apparitions are dream symbols fabricated both by, and for, himself, representing repressed or unconscious ideas. These psychological projections are characterised using taxonomic pastiche:

The head of a worm began to come slowly out of the earth, as big as that of a polar bear and much resembling it, with a white mane to its red neck [...] one large serpent was covered from head to distant tail in feather of glorious hues.<sup>96</sup>

This phylogenetic miscellany gestures towards the competing biological and psychological discourses that underscore the novel, the monsters' hybridity representing both rich symbolic dream-content and a version of biogenetic development. The notion that animals advanced by adding new stages onto existing embryonic development, embodied in Haeckel's biogenesis, is monstrously represented by Vane's spontaneously-generated psychological apparitions. Vane's bad thought-forms must first advance through these more 'primitive' stages before they can become noble thoughts. However, to achieve enlightenment Vane must also recognise and accept Man's original sin, a

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<sup>95</sup> David A. Griffith, 'George MacDonald's *Lilith A*: A Transcription. (Unpublished Master's Thesis, Virginia Tech, 2001) p.39.

<sup>96</sup> MacDonald, *Lilith*, p.40.



historical burden implied in his apparently preternatural recollection that: 'Then, of a sudden, but not once troubling my conscious bliss, all the wrongs I had ever done, from far beyond my earthly memory down to the present moment, were with me.'<sup>97</sup> This suggests that Vane has access to inherited memory traces—an idea that again combines biological and psychological frameworks.

The notion of inherited memory or experience is present in evolutionary and developmental discourse; Haeckel attributes his biogenetic law to an allied process: 'the original features of the ancestral history are reproduced or recapitulated in the embryonic processes [...] these facts can only be explained by the unconscious memory of the plasm.'<sup>98</sup> Although he is talking about somatic rather than psychic memory here, he uses a kind of rhetoric that blurs the boundaries between these different types of memory. He talks about the 'psychic' life of unicellular organisms, dubbing cellular plasm as the 'cell-soul'<sup>99</sup> and attributes the reproduction of the complex forms of the unicellular radiolaria from generation to generation to 'a tenacious recollection of the architectural power of their fathers'.<sup>100</sup> Moreover, when talking of human children, he notes that hereditary transmission 'extends to the finest characteristics of the soul as well as of the body',<sup>101</sup> suggesting more than a purely physiological inheritance. However, he argues that the personal soul comes into existence at the moment of impregnation, denying it

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<sup>97</sup> MacDonald, *Lilith*, p.202.

<sup>98</sup> Haeckel, *Last Words on Evolution*, p.96.

<sup>99</sup> 'Soul' being associated with a person's thoughts; the moral and emotional faculty. See: 'Soul, n. 3a' *Oxford English Dictionary* 3<sup>rd</sup> edn. (Oxford: Oxford University Press, 2012) <<http://www.oed.com/view/Entry/185083>> [accessed 20 March 2016]

<sup>100</sup> Haeckel, *Last Words on Evolution*, p.94.

<sup>101</sup> Haeckel, *Last Words on Evolution*, p.95.

immortality. This would appear to depart from notions of the inheritance of collective ideas or experiences, however he does talk about the 'stem-history' of the soul, suggesting that although the personal soul comes to an end when the brain dies, the universal 'pre-soul' might be made immortal through its hereditary transmission. This transmission might find congruence with Freud's theory of the development of the psyche and MacDonald's literary depiction of sinful inheritance and spiritual development.

Much has been written on the influence of biological theories of evolution on Freud's psychoanalytic work, particularly the appropriation of the notion of phylogenetic inheritance.<sup>102</sup> The influence of recapitulation theory on Freud's psychological work can be seen most overtly in his desire to 'bring the neurotic stages of regression into harmony with the stages of human phylogeny' in *A Phylogenetic Fantasy*.<sup>103</sup> However, traces of this idea of recapitulation or inherited dispositions can be seen elsewhere and are evidently present at the edge of much of Freud's thinking. In the preface to the third edition of *Three Essays on the Theory of Sexuality* (1914), he notes 'disposition is ultimately the precipitate of earlier experiences of the species to which the more recent experience of the individual [...] is super-added'.<sup>104</sup> This suggests a phylogenetic inheritance, which acts as a basis for the development of the psyche of each individual. However, this inheritance is not

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<sup>102</sup> See, for example: Emanuel Garcia, 'In the Beginning... Phylogeny in Freud's Overview of the Transference Neuroses: A Review-Essay' *Jefferson Journal of Psychiatry* 6(1988)2 pp.89-99; Peter T. Hoffer, 'The Concept of Phylogenetic Inheritance in Freud and Jung' *Journal of the American Psychoanalytic Association* 40(1992) pp.517-530; Jonathan N. Stead, 'Freud's Conceptualization of the Social World: Psychology Recapitulating Sociology or Sociology Recapitulating Psychology?' *Europe's Journal of Psychology* 8(2012)1 pp.182-202; Frank Sulloway, *Freud: Biologist of the Mind: Beyond the Psychoanalytic Legend* (Cambridge: Harvard University Press, 1992).

<sup>103</sup> Freud, *A Phylogenetic Fantasy*, p.16.

<sup>104</sup> Sigmund Freud, *Three Essays on the Theory of Sexuality* trans. James Strachey (New York: Basic Books, 2000) p.xxvi.

immediately available, as suggested in *Instincts and their Vicissitudes* (1915) when Freud notes, 'if inherited mental formations exist in the human being [...] these constitute the nucleus of the unconscious.'<sup>105</sup> In other words, the inherent qualities of the mind are inherited along with our physical characteristics, but these inheritances chiefly reside in the unconscious mind. Elsewhere he connects this phylogenetic heritage with phantasy; he argues that when an individual's own experiences are lacking, 'the individual reaches beyond his own experience into primeval experience,' filling in the gaps with 'prehistoric truth.' The primal phantasies of children, he argues, are based on 'once real experiences in the primeval times of the human family,'<sup>106</sup> a phenomenon that explains the repetition of the same phantasies again and again through the utilisation of common inherited experience. The idea is propounded again in *Moses and Monotheism* (1937): 'the archaic heritage of human beings comprises not only dispositions, but also subject matter—memory traces of the experience of earlier generations.'<sup>107</sup> Hungarian psychoanalyst Sándor Ferenczi appears to entertain a similar notion in 'Stages in the Development of the Sense or Reality' (1913) when he talks about the 'transference of memory traces of the race's history onto the individual'.<sup>108</sup> These common trains of thought reflect the interactions

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<sup>105</sup> Sigmund Freud, 'Instincts and their Vicissitudes' [1915] *On the History of the Psycho-Analytic Movement, Papers on Metapsychology and Other Works. The Standard Edition of the Complete Psychological Works of Sigmund Freud* Vol. 14 trans. James Strachey (London: Vintage, 2001) p.195.

<sup>106</sup> Sigmund Freud, *Introductory Lectures on Psycho-Analysis (Part III). The Standard Edition of the Complete Psychological Works of Sigmund Freud* Vol. 16 trans. James Strachey (London: Vintage, 2001) p.371.

<sup>107</sup> Sigmund Freud, 'Moses and Monotheism' *Moses and Monotheism, An Outline of Psycho-Analysis and Other Works. The Standard Edition of the Complete Psychological Works of Sigmund Freud* Vol. 23 trans. James Strachey (London: Vintage, 2001) p.99.

<sup>108</sup> Sándor Ferenczi, 'Stages in the Development of the Sense or Reality' *First Contributions to Psychoanalysis* trans. Ernest Jones. (New York: Brunner/Mazel, 1952) p.219-220.

between biological and psychological formations of the individual and collective self; the presence of this idea in Freud's, Haeckel's, and MacDonald's work (among others) demonstrates the impact of this cultural moment on understandings of identity.

The grounding of both psychoanalytic and evolutionary theory in embryological research provides a common lexicon for talking about the development of the individual. Axel Hoffer notes that Freud and Ferenczi's shared interest in the transmission of trauma brought them to the work of Jean-Baptiste Lamarck.<sup>109</sup> Indeed Freud and Ferenczi planned to write jointly on Lamarck and Psychoanalysis, but the work never materialised. Additionally Ferenczi planned to write 'On the Justification of Psychoanalytic Points in View of the Biological Sphere of Knowledge', but again this work did not materialise. Lamarckian thought, which Ilse Grubrich-Simitis argues was rediscovered in the late-century, following the ascendance of Darwinism,<sup>110</sup> argued for the inheritance of characteristics acquired during an individual's lifetime. For Freud and Ferenczi this meant the inheritance of traumatic memory traces, a version of which MacDonald appears to advocate in his novel. Peter Hoffer perceives a similar biogenetic-Lamarckian thread in the work of Carl Jung, which developed in collaboration with Freud and ultimately produced his notion of the 'collective unconscious'.<sup>111</sup> Both the notion of inherited traumas and the presence of the universal archetypes that

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<sup>109</sup> Axel Hoffer, 'Introduction' in *The Correspondence of Sigmund Freud and Sándor Ferenczi Vol 2 1914-1919* eds. Ernst Falzeder and Eva Brabant, in collaboration with Patrizia Giampieri-Deutsch, trans. Peter T. Hoffer (Harvard: Harvard University Press, 1996) p.xxxvi.

<sup>110</sup> Ilse Grubrich-Simitis, 'Metapsychology and Metabiology' in *A Phylogenetic Fantasy: Overview of the Transference Neuroses*, pp.73-108. (p.101).

<sup>111</sup> Peter T. Hoffer, 'The Concept of Phylogenetic Inheritance in Freud and Jung' *Journal of the American Psychoanalytic Association* 40(1992) pp.517-530.

represent them can be read in *Lilith*. These traumatic inheritances are, for MacDonald, congruous with mankind's inheritance of universal sin following the Fall.

Jung's insistence that 'myths are first and foremost psychic phenomena that reveal the nature of the soul' and that primitive man's unconscious psyche 'ha[d] an irresistible urge to assimilate all our sense experiences to inner psychic events'<sup>112</sup> finds congruence with MacDonald's assertion that 'the world is [...] the human being turned inside out':

All that moves in the mind is symbolised in Nature. Or, to use another more philosophical, and certainly not less poetic figure, the world is a sensuous analysis of humanity, and hence an inexhaustible wardrobe for the clothing of human thought.<sup>113</sup>

This supports my claim that *Lilith* is to some extent a philosophical novel intended to explore the inner workings of the mind as represented by the imagining of 'another world'. In other words, MacDonald's other world is an externalisation of Vane's psyche and thus a working allegory for the state of his soul.

MacDonald's novel is ripe for psychoanalytic analysis; in its allegorical nature and theological subject matter the narrative presents what Jung would recognise as common archetypes. The 'dual mother' motif is expressed in the Lilith-Eve dynamic and the 'twice-born' motif might be read in Vane's attempt

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<sup>112</sup> Carl Jung, *The Archetypes and the Collective Unconscious* trans. R. F. C. Hull, 2nd edn. (New York: Bollingen Foundation Inc, 1959) p.6.

<sup>113</sup> MacDonald, 'The Imagination: its Functions and its Cultures', p.17.

to die and reawaken in the house of God. Some of Jung's other archetypes are also recognisable: 'the mother', 'the child', 'the shadow' and 'the animal' can be read in 'Eve', 'Lona', 'the Great Shadow', and 'the leopardess'. Indeed Bonnie Gaarden argues convincingly that the character of Lilith might be read as a psychological projection decoded by the work of Jung and Erich Neumann. In her book *The Christian Goddess: Archetype and Theology in the Fantasies of George MacDonald* she suggests that descriptions of Lilith characterise her as a combination of Neumann's Terrible Mother<sup>114</sup> and Jung's Negative Anima.<sup>115</sup> Lilith's identification as 'anima'—a projection of the feminine aspects of man's psyche—is upheld by Vane's first sighting of her in the Bad Burrow, which we have previously ascertained to be his Unconscious. Her body is then divided into further archetypal images—serpents representing her association with sin, and a bat, compounding her generation from the 'dark portion of his being':

Suddenly pressing both hands to her heart, she fell to the ground [...] her legs, hurrying from her body, sped away, serpents. From her shoulders sped her arms as in terror, serpents also. Then something flew up from her like a bat, and when I looked again, she was gone.<sup>116</sup>

As MacDonald's novel predates Jung and Neumann by several decades it is clearly not possible to argue for conscious reference, but rather I argue for ideological confluence. The common archetypes that Jung reads in mythical

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<sup>114</sup> A notion of the mother as fearsome and destructive, which springs from Carl Jung's theory of the collective unconscious – the shared, inherited collection of unconscious ideas or "archetypes" which are passed down genetically and expressed in pan-cultural mythology.

<sup>115</sup> The negative image of woman present in the male unconscious.

<sup>116</sup> MacDonald, *Lilith*, p.41.

and theological discourse, MacDonald gestures towards in his understanding of the natural world as 'an inexhaustible wardrobe for the clothing of human thought.'<sup>117</sup> This clothing is given symbolic significance in *Lilith*, which might be fruitfully read as psychological allegory. MacDonald offers the reader a narrative that is not as overtly allegorical as other theological tracts, like *A Pilgrim's Progress*, but is a more complex rendering of the psychological and ethical self, underpinned by multiple interpretive frameworks, and, as I will now argue, indebted to the motif of the parasite-host relationship.

As the principal antagonist and title character, it is significant that Lilith is so heavily associated with the motif of the parasite. She is chiefly described using the lexis of helminthology, bodily associated with worms and serpents, and is even the subject of a parasitic infestation when Vane witnesses a worm burrow into her flesh. She is also made synonymous with 'the white leech' and carries out a physical parasitism by sucking Vane's blood at night, unbeknownst to him. Although we might attribute Lilith's parasitic qualities to her literary heritage (her association with the Babylonian incubi and succubae, and identification with the Greek lamiae)<sup>118</sup> her characterisation as selfishness personified—"I will do as my Self pleases – as my Self desires"<sup>119</sup>—serves a specific function within the narrative, aligning her allegorically with the unconscious. MacDonald uses physical parasitism to signify her instinctual selfishness. When Vane meets Lilith for, what he considers to be, the first time, she is half-dead. He spends several weeks

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<sup>117</sup> MacDonald, 'The Imagination: Its Function and its Culture' p.17.

<sup>118</sup> Bonnie Gaarden, 'Cosmic and Psychological Redemption in George MacDonald's *Lilith*' *Studies in the Novel* 37(2005)1 pp.20-36. (p.23).

<sup>119</sup> MacDonald, *Lilith*, p.175.

bathing her body in a hot stream in the hopes of reviving her and begins to experience the nocturnal visitations of a leech: 'the back of [my hand] was much swollen, and in the centre of the swelling was a triangular wound, like the bite of a leech.'<sup>120</sup> She has been feeding on his blood and thus her first action in the narrative is an exploitative one. MacDonald uses biological models to transform her selfish instincts into a literal act of parasitism:

Came a cold wind with a burning sting – and Lilith was upon me [...] her teeth [she] fixed them into my flesh. I lay as one paralyzed. Already the very life seemed flowing from me into her.<sup>121</sup>

Given the characterisation of the other world and all within it as products of Vane's own psyche, Lilith might be read as a bad thought-form, produced from Vane's mental landscape. Thus Vane's emotional struggle with Lilith, his attraction to and desire for her, despite her callous and damaging treatment of him, represents Vane's struggle with his own base wants and desires. Lilith herself is presented as undergoing a similar power struggle with her own unconscious desires when Adam asks her "You will do as the Shadow, overshadowing your Self inclines you?"<sup>122</sup> By surrendering to the Great Shadow, Lilith has symbolically surrendered to her unconscious. The power dynamic here between conscious and unconscious desires is clearly concerned with mental and physical autonomy.

The link between abstract selfishness and physical parasitism is compounded when Vane notes that 'selfishness [is] but a parasite on the tree

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<sup>120</sup> MacDonald, *Lilith*, p.88.

<sup>121</sup> MacDonald, *Lilith*, p.168.

<sup>122</sup> MacDonald, *Lilith*, p.175.



of life',<sup>123</sup> an observation that characterises selfishness as both natural and harmful. Freud scholars might read Lilith's parasitic behaviour as libidinal gratification with an oral fixation, marking her as developmentally arrested or as a product of an early stage in psychosexual development (itself, according to some readings of Freud, a recapitulation of species-level human evolution). The Oedipus complex which is associated with psychosexual development for Freud, is discussed at length in relation to mental evolution in *A Phylogenetic Fantasy* and echoed in MacDonald's narrative by Lilith's murdering of the children of Bulika in fear of their killing her.

The parasite motif used throughout the narrative performs multiple functions, not least indicating somatic degeneration, as suggested by her demarcation as metaphorically invertebrate (owing to her associations with leeches and worms). It enables MacDonald to articulate the negative impact of bad thought-forms on the mind. Lilith as archetype represents the undesirable aspects of the human psyche, Jung's negative anima, and Freud's inherited trauma—concepts that articulate an anxiety concerning the heterogenous self and its connection to identity at the level of the individual and the species. MacDonald's narrative clearly recognises the psychological and somatic complexities of selfhood and their interconnections. Lilith as a selfish thought-form embodies this psycho-somatic understanding, which is chiefly explored using the discourses of parasitism:

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<sup>123</sup> MacDonald, *Lilith*, p.70.

I lay a heartless thing against his heart, giving him nothing where he gave his whole being to clothe me human that I at last into his sense might dart, thus first into his living mind I stole (126).

The notion of something laying against the heart and darting into the senses recalls the lines quoted at the beginning of the chapter: 'an infinite number of worms swimming in the blood and sallying from the heart through the arteries'.<sup>124</sup> Lilith is even directly allied with worms in the text:

She knows no more than [...] the worm that makes two worms when it is cloven asunder. Vilest of God's creatures, she lives by the blood and lives and souls of men. She consumes and slays, but is powerless to destroy as to create (128).

Her lack of power concerning creation echoes the contention regarding God's role in the spontaneous generation of entozoa; Lilith, symbolic of the parasite, cannot generate life without God's sanction and herself was called into being by the hand of God. The notion of Lilith's being 'wrought by him out of himself' might encompass both a psychological projection and a spontaneous organic generation. I argue that these two concepts had become intertwined for many writers; the psychological and the somatic infiltration were allied concepts threatening the moral and physical integrity of man. Although the spontaneous generation of parasites was in disrepute, the concept of such generations within the mind/body system was still captivating the public imagination and lent itself to fictional exploration. MacDonald provides us

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<sup>124</sup> Ramesey, p.6.

with a description of a physical infiltration that has psychological ramifications when Lilith is set upon by a worm:

The creature had passed in by the centre of the black spot, and was piercing through the joints and marrow to the thoughts and intents of the heart [...] I knew the worm was in her secret chamber (176).

This physical infiltration transports Lilith into 'the hell of her own self-consciousness', making a direct connection between physical parasitism and psychological suffering (176). In this way the discourses of parasitology provide a lexis in which MacDonald can explore the intricacies of the psyche and its relationship to the physical world. In his complex exploration of somatic and mental selfhood, underwritten by religious dogma, MacDonald repeatedly relies on the structures and ideologies of the parasite-host relationship.

### **Psycho-Somatic Parasitism and the Degenerative Psyche**

Robert Louis Stevenson's 'Strange Case of Dr Jekyll and Mr Hyde' (1886) explores the connection between psychological and somatic identity in more detail, again using a distinctly parasitic framework. I argue that Stevenson too employs the associative motifs we have seen thus far, those of recapitulation, atavistic degeneration, and monstrosity to critique modes of behaviour, set against the backdrop of the biogenetic-Lamarckian thought discussed previously. The parasite-host relationship becomes a prime motif for

discussing autonomy, psychological authority, and physical selfhood.

When describing the Jekyll-Hyde relationship, Stevenson notes that 'these incongruous fagots were thus bound together that in the agonised womb of consciousness, these polar twins should be continuously struggling'.<sup>125</sup> The power dynamic embodied in this description articulates an apprehension concerning the presence within the host body of another organismal identity. Like Lilith, Stevenson's Hyde shares many physical and behavioural attributes with the biological parasite, however, at the same time, he is situated in the intangible realm between mind and body. The phrase 'agonised womb of consciousness' identifies his genesis as beginning in the mind, however, elsewhere he is presented as having a more somatic grounding, able to change the stature and appearance of Jekyll's body. The description of the struggle between them echoes the medical use of 'parasite' listed in the OED as pertaining to 'the smaller and less completely developed member of a pair of unequal conjoined twins.'<sup>126</sup> The *Medico-Chirurgical Review* of 1840 used this definition in a report on the discovery of foetuses in the uteruses of young virgin girls and in the testicles and internal cavities of boys: 'we must admit that one of the foetuses becomes somehow inclosed [sic] within, and grows as it were, at the expense of the other; hence the latter is appropriately termed by St. Hilaire "parasite."<sup>127</sup> The notion of a twin growing at the expense of the other could usefully be applied to the

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<sup>125</sup> Robert Louis Stevenson, 'Strange Case of Dr. Jekyll and Mr. Hyde' in *Dr Jekyll and Mr Hyde and Other Tales* ed. Roger Luckhurst (1886; Oxford: Oxford University Press, 2008) pp.1-66. (p.53).

<sup>126</sup> 'Parasite, n.' *Oxford English Dictionary* 3rd edn. (Oxford: Oxford University Press, 2005) <<http://www.oed.com/view/Entry/137636>> [accessed 20 March 2016].

<sup>127</sup> James Johnson, and Henry James Johnson, eds. 'A Novel Monstrosity – Portion of a Foetus Developed at the Expense of the Testicle' *The Medico-Chirurgical Review, and Journal of Practical Medicine* 33(1840) pp.516-18. (p.518).

relationship that Hyde has with Jekyll. Mr Utterson even ruminates on Dr Jekyll's connection to Mr Hyde as founded upon 'the cancer of some concealed disgrace',<sup>128</sup> seamlessly fitting the medical supposition that internal parasites may cause cancer in unused organs, or that cancerous tumours were themselves parasitical animals.

The subsequent characterisation of their relationship lends further credence to Hyde's depiction as a parasite. The power dynamic Stevenson creates between the two is markedly similar to the parasite-host relationship, just as the host's physical health fluctuates in line with infestation, Jekyll becomes 'a creature eaten up and emptied by fever, languidly weak both in body and mind.'<sup>129</sup> Moreover, Hyde's potency increases as Jekyll's health declines, benefitting at the direct expense of his host: 'the powers of Hyde seemed to have grown with the sickness of Jekyll'.<sup>130</sup> His impact is both mental and physical, generated seemingly from the recesses of Jekyll's mind, but exerting a physical presence within his body. Indeed descriptions of Hyde as 'troglodytic' further compound the notion that he is taking refuge within Dr. Jekyll—a troglodyte being a prehistoric cave-dweller. This appellation also introduces the primitivism that later dominates descriptions of Hyde, as well as the figure of the parasite more generally. Indeed, the parasitic relationship has as much to do with sharing dwellings as it does to do with sharing bodies. Stevenson's parasite encompasses what I have elsewhere called the 'literary

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<sup>128</sup> Stevenson, 'Dr Jekyll and Mr Hyde', p.17.

<sup>129</sup> Stevenson, 'Dr Jekyll and Mr Hyde', pp.64-65. The reference to fever here is particularly significant, given the prominence of it as a symptom of parasitic infestation.

<sup>130</sup> Stevenson, 'Dr Jekyll and Mr Hyde', p.65.

parasite'.<sup>131</sup> As I argued in the introduction, this fictional archetype is a hybridised figure in the late nineteenth century, which combines aspects of the social and biological parasites to form an antagonist underpinned by the fear of atavistic degeneration. As Elizabeth Tylawsky notes, the social parasite, caricatured in Greco-Roman comedy, represented 'the lowest member of society [...standing] at the threshold and str[iving] to gain admittance to the household and share in the feast.'<sup>132</sup> She recognises the prototypical social parasite as manifest in Plautus' *Saturio* and having antecedents in the hungry dependents of the *Odyssey*—figures that came to represent and critique unequal patronage relationships.<sup>133</sup> These figures were depicted as both sycophantic and socially savvy, as pathetic hangers on or sly manipulators. The biological parasite, gaining traction in the nineteenth century with the rise of parasitology and its related disciplines, was, at least in the early century, considered morphologically simple and physiologically degenerated. The dialogue between these two types of parasite in this period is identifiable, I argue, in a number of fictional antagonists who are socially exploitative, but physiologically degenerated, reflecting the behaviour of the social parasite and the morphology of the biological. The semantic heritage of the biological parasite undoubtedly remained in the public mind; in 1889 *The Graphic* published a piece on parasites that consciously acknowledged it, using Swift's 'On Poetry: A

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<sup>131</sup> See: Emilie Taylor-Brown, "'She Has a Parasite Soul!': The Pathologization of the Gothic Monster as Parasitic Hybrid in Bram Stoker's *Dracula*, Richard Marsh's *The Beetle*, and Arthur Conan Doyle's *The Parasite*' in *Monsters and Monstrosity from the Fin de Siècle to the Millennium* eds. Sharla Hutchinson and Rebecca A. Brown (Jefferson: McFarland, 2015) pp.12-28.

<sup>132</sup> Elizabeth Ivory Tylawsky, *Saturio's Inheritance: The Greek Ancestry of the Roman Comic Parasite* (New York: Peter Lang, 2002) p.2.

<sup>133</sup> Tylawsky, pp.1-20.

Rhapsody' as an access point.<sup>134</sup> The author then uses Gilbert and Sullivan's *The Mikado* to further link the two types of parasite:

Even the "*protoplasmic primordial atomic globule*" to which Mr Gilbert's Pooh-Bah traced his ancestry was probably troubled with its "little fleas," while the higher animals, including man, are undoubtedly victimised by a multitude of hungry dependents.<sup>135</sup>

This statement satirically highlights both mankind's common descent from 'atomic globules' and our obsession with ancestry, and in the process drew attention to the long running relationship that mankind has had with his organic parasites. However, it also overtly refers to their etymological ancestors and the Homeric structuring of society that produced these ancestors with the phrase 'hungry dependents'.

Hyde's biological and social exploitation invokes a double identity, fitting him as a literary parasite. In addition to the previously noted bodily abuse, Hyde profits materially from Jekyll, who provides him with a signature (by sloping his own hand-writing backwards), money, and access to the building. Hyde's disregard for social convention begins to affect Jekyll, who steadily loses hold of his physical identity, increasingly waking up in an unfamiliar body: 'I had gone to bed Henry Jekyll, I had awakened Edward Hyde' (58). This unfamiliar body has corded, hairy hands, suggesting a less cultivated and more animalistic disposition. Thus Jekyll's participation in Hyde's immoral

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<sup>134</sup> The quotation runs: 'Larger fleas have little fleas/upon their backs to bite 'em/the little fleas have lesser fleas/And so *ad infinitum*' this is in fact from a nursery rhyme based loosely on Swift's lines, called *The Siphonaptera* (which refers to the taxonomic order to which fleas belong).

<sup>135</sup> W.C. F. 'Parasites' *The Graphic*, Saturday 13 July 1889, p.54.

behaviour—'Jekyll [...] now with a greedy gusto, projected and shared in the pleasures and adventures of Hyde,' (59)—instigates a physical degeneration, which points to a more overt anxiety concerning the impact of moral depravity on a previously upstanding member of Victorian society.

The *Leicester Chronicle* of 1883 highlighted the dangers of such socially parasitic behaviour by expanding the parameters of the parasite-host relationship:

The parasite may be a plant, an animal, a class, a society, a church or a nation. The mistle-toe is parasitic on the oak or apple tree; the thread-worm on animals; the tapeworm on man; man on other men.<sup>136</sup>

The juxtaposition of social and biological relationships here serves to highlight the notion that a parasite is defined by its behaviour: 'a creature, which too idle to take part in the battle of life, attaches itself to a more vigorous organism, and lives on its resources'.<sup>137</sup> The article makes explicit the link between behaviour and biology; the writer describes the phenomenon of degeneration induced by parasitic behaviour: 'having nothing to do, the power of doing eventually departs. Limbs shrivel up, organs disappear [...] the creature sinks in the scale of life', and connects this phenomenon to wider societal decline. This biological reality is used as an allegorical threat, 'parasitism was rampant during the decay of energy and morals under the Roman Empire,' says the Editor, establishing a connection, not only to the time of the social parasite's comic popularisation, but also to

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<sup>136</sup> 'Parasites', *The Leicester Chronicle and Mercury*, Saturday 17 November 1883, p.4.

<sup>137</sup> 'Parasites', *The Leicester Chronicle and Mercury*, p.4.



the parasite's associative relationship with a host's moral code. This same motif had appeared in an earlier *Reynold's Newspaper* article of 1855 within an anti-monarchy essay titled 'Monarchs – their parasites and their victims'. The article identified a parasitic relationship between monarchs and their kingdoms, characterising the 'people of the present day' as hosts who support their sovereigns with 'their blood, their toil and their treasures [...] receiv[ing no] advantage in return.'<sup>138</sup> Most significantly, the writer accused 'certain classes', themselves parasitic, as supporting the system, and referred to their sycophantic behaviour in the language of spontaneous generation, 'these glittering insects, generated in the putrescent of royalty.' By implying that there is a similar relationship between the courtiers and their sovereigns, as between 'frogs' and the 'marshes in which they are engendered', the writer establishes a connection with disease.<sup>139</sup> The generation of parasites from decaying matter, implied by the word 'putrescent', is consistent with some of the discourses analysed earlier regarding internal parasites and served to perpetuate the erroneous beliefs lamented by T. Spencer Cobbold at the beginning of the chapter.

This same discourse is employed in 'Strange Case of Dr Jekyll and Mr Hyde' when describing Hyde as 'something not only hellish, but inorganic. This was the shocking thing; [...] that the amorphous dust gesticulated and sinned; that [which] was dead, and had no shape, [c]ould usurp the offices of

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<sup>138</sup> 'Monarchs – their Parasites and their Victims' *Reynolds's Newspaper*, Sunday 7 October 1885, p.3.

<sup>139</sup> 'Monarchs', p.3. Malaria was still popularly called 'marsh fever' owing to the connections between marshland and the transmission of this parasitic disease. Varro and Lancisi both attributed malaria to minute organisms and insects engendered in marshland.

life.'<sup>140</sup> Here Stevenson explores the notion of spontaneous generation from inorganic matter, however, he applies it to the human psyche. This application, which we have already seen in MacDonald's *Lilith*, springs from an entanglement of disciplinary thought borne out of what Rick Rylance calls the 'generalist nature of Victorian intellectual culture.'<sup>141</sup> He maps early British psychology as an open discourse, constructed by multiple professions and located in, not just specialist psychological texts, but periodical essays, novels, poems, philosophical thought and political writings. I have already located this discourse in *Lilith*, in MacDonald's treatise on the imagination, as well as in Jungian and Freudian psychological theory, and even in Haeckel's discussions of evolution. Stevenson's own interest in psychology might be seen in his essay 'A Chapter on Dreams' published in *Scribner's Magazine* in 1888, in which he explores the intricacies of the imaginative power of dreams.

He aligns the phenomenon of dreaming with leading a 'double life'<sup>142</sup> and narrates a recurrent dream-sequence that troubles him enough to 'send him, trembling for his reason to the doors of a certain doctor; whereupon with a simple draught he was restored to the lot of the common man' (153-4). By 'the lot of the common man' he means the ability to experience a 'normal' dream state, rather than one which is so realistic that it cannot be 'prov[ed] to be false' (153). This dual life is expressed in *Lilith* when Mr. Vane is transported between worlds and unable to determine which is more real. The

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<sup>140</sup> Stevenson, 'Dr Jekyll and Mr Hyde', p.65.

<sup>141</sup> Rick Rylance, *Victorian Psychology and British Culture, 1850-1880* (Oxford: Oxford University Press, 2000) p.1.

<sup>142</sup> Robert Louis Stevenson, 'A Chapter on Dreams' in *Dr Jekyll and Mr Hyde and Other Tales* ed. Roger Luckhurst (Oxford: Oxford University Press, 2006) pp.151-162. (p.153).

suggestion of mental instability inherent in Stevenson's anecdote, 'trembling for his reason', functions to endow the creative imagination with the power to undermine the stability of the ego. Freud would later identify such dreams as foci for the expression of the unconscious. The novel inspired by this episode (the transformative powers of the draught are poignantly reminiscent of the defining crux of the Jekyll-Hyde plot) explores the warring factions of the heteronomous mind, with Hyde characterised by traits common to the unconscious. That the transformation causes a loosening of the unconscious is evident in Jekyll's narrated experience: 'I was conscious of a heady recklessness, a current of disordered sensual images running like a millrace in my fancy, a solution of the bonds of obligation' (54). Hyde is further classified as 'that which stood within', and as a kind of psychic projection: 'the thing that was projected was Edward Hyde' (56). Jekyll's observation that he has been 'sold a slave to [his] original evil' (57), alludes to the tyranny of unconscious desires, the word 'original' suggestive of a regression to a state characteristic of earlier mental development. Freud's narration of the emergence of modern civilised humans in *A Phylogenetic Fantasy* argues that '[primal man] had not yet built up a system of the Pcs [preconscious] over his Ucs [unconscious],'<sup>143</sup> suggesting that at this point the unconscious had unmediated access to the conscious mind. Jekyll's experience then, reminiscent of this unmediated unconscious presence, might even represent, in Freudian terms, a phylogenetic regression to a mental state reminiscent of pre-civilised man. Jekyll's unconscious, embodied in Hyde, whose 'every act

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<sup>143</sup> Sigmund Freud, 'XII Overview of the Transference Neuroses' *A Phylogenetic Fantasy: Overview of the Transference Neuroses* ed. Ilse Grubrich-Simitis (Cambridge: Belknap Press, 1987) p.15.

and thought centred on self' (57), is loosed from the 'prisonhouse of [his] disposition' when Jekyll takes the potion. This language of confinement, reinforced when Jekyll talks about his identity as a 'fortress', further characterises the relationship as one akin to the relationship between the unconscious and conscious mind.

In *The Interpretation of Dreams* (1900), Freud quotes Scholz's insistence that 'nothing which we have once mentally possessed can be entirely lost'.<sup>144</sup> He designates the unconscious as an infinite storage for memory traces, the depths of which are realised in dream-state. Stevenson notes a connection between dreams and memories too when he says:

The past [...] is lost forever: our old days and deeds, our old selves too, and the very world in which these scenes were acted, all brought down to the same faint residuum as last night's dream.<sup>145</sup>

Although his reference to dreams serves to highlight the transience and impermanence of the past he does admit that it exists as 'incontinuous images' that 'echo in the chambers of the brain,' perhaps allowing for something akin to a Freudian structuring of unconscious memory. Indeed Stevenson counts these memory traces as foundational to identity; 'we only know ourselves' he says, 'by these air-painted pictures of the past'.<sup>146</sup> His privileging of our pasts as defining our present has commonalities with the biogenetic-Lamarckian thought of Freud, Ferenczi, and Jung. Freud notes that

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<sup>144</sup> Sigmund Freud, *The Interpretation of Dreams: The Complete and Definitive Text*, trans. and ed. James Strachey (1900; New York: Basic Books, 2010) p.19.

<sup>145</sup> Stevenson, 'A Chapter on Dreams', p.151.

<sup>146</sup> Stevenson, 'A Chapter on Dreams', p.151.

Henry Havelock Ellis considers the dream as 'an archaic world of vast emotions and imperfect thoughts' which, when analysed, gives us a picture of the 'primitive stages of mental life'. He goes on to note that J. Sully thinks of dreams as 'a means of conserving these successive [earlier] personalities. *When asleep we go back to the old ways of looking at things and of feeling about them, to impulses and activities which long ago dominated us.*<sup>147</sup> These observations, reminiscent of Freud's later essay on mental phylogeny, suggest that a reversion to the early life of the individual is possible; but how far back might our minds be able to take us? Havelock Ellis's 'primitive stages of mental life' suggests, ambiguously, to the earlier psychological development of the individual, or perhaps even to the earlier psychological development of the species, evoking theories of recapitulation.

The connection between phylogenetic recapitulation and mental development had been made in 1826 by French embryologist Étienne Serres who, developing his own theory of recapitulation, argued that the human brain developed through the stages of the natural hierarchy, resembling first a piscine brain, then reptilian, avian, and generalised mammalian, before finally settling into the form of the human brain.<sup>148</sup> Forty years later Haeckel adapted the work of Serres, as well as German anatomist Johann Meckel to form his biogenetic law. The theory was founded upon the expression of atavisms—the recurrence of traits characteristic of an ancestral form, like the

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<sup>147</sup> Freud, *The Interpretation of Dreams*, p.89.

<sup>148</sup> Lindsey O'Connell, 'The Meckel-Serres Conception of Recapitulation' *The Embryo Project Encyclopedia* (Tempe: Arizona State University, 2015) <<http://embryo.asu.edu/handle/10776/5916>> [accessed 20 March 2016].

appearance of pharyngeal slits in human foetal development.<sup>149</sup> The connection between the evolution of the species and the evolution of the individual<sup>150</sup> situates man on a linear scale with uncomfortable proximity to less developed versions of ourselves. The notion that this progression might be subject to reversal is reflected in Haeckel's discussion of the origin of the vertebrate type. He cites the amphioxus as being the lowest existing form of vertebrate animal, however suggests that the ascidian might too represent an early vertebrate type owing to its developmental resemblance to other vertebrate organisms. The ascidian develops several features of the vertebrate, including notochord, medullary tube, and rudimentary sense organs, but is subsequently seen to degenerate:

It sinks to the bottom of the sea and becomes fixed, the tail with the notochord degenerates and is cast off, and the tailless body, by retrograde metamorphosis, loses all its vertebrate characteristics and becomes a shapeless sac [...] these curious facts are held to prove that the Ascidians really represent a degenerated branch of the ancestral vertebrate, very near the point of its actual origin.<sup>151</sup>

Thus, for the Ascidian, an evolutionary degeneration is played out in every embryological development, with the organism effectively travelling backwards along the line of morphological progression. These discourses on

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<sup>149</sup> Stephen Jay Gould, *Ontogeny and Phylogeny* (Cambridge: Harvard University Press, 1977) pp.2-3.

<sup>150</sup> Haeckel notes: 'In Germany evolution always meant embryology, or a part of the whole, until forty years ago.' *Last Words on Evolution: A Popular Retrospect and Summary* trans. Joseph McCabe (New York: Peter Eckler, 1905) p.30.

<sup>151</sup> Alfred Russel Wallace, 'Haeckel's "The Evolution of Man"' *The Academy*, 19 April 1879, pp.351-52. (p.351).

degeneration dovetailed with psychological treatise on memory, and biological theories about inheritance, to produce diverse anxieties concerning the significance of our mental and physical past(s), often underscored by an overriding apprehension about primitivism. It is these entangled discourses that I read in Stevenson's novel.

Hyde embodies the fear that we might contain primitive elements within us that are latent and waiting to be awoken: 'I still hated and feared the thought of the brute that slept within me' (64). The generalised notion of an atavistic presence is suggested by Stevenson's portrayal of the Jekyll-Hyde relationship. Hyde bears the 'stamp of the lower elements in [Jekyll's] soul' (54) and is characterised as less developed, with 'an imprint of deformity and decay' (54). Indeed, the multiple narrators throughout the story continually note Hyde's deformity. He is generated out of Jekyll's body and mind, but expresses a more primitive phenotype. This is fused with psychological and parasitical anxieties when Jekyll ruminates over the concept of individual identity, arguing that '[man will eventually be known to consist of] a mere polity of multifarious, incongruous, and independent denizens' (53). This is a concept that gains significance in light of Freud's topographic (unconscious/preconscious/conscious) and later structural (Id/Ego/Superego) theories of mind, the latter based on 'conflict within and among three agencies'.<sup>152</sup> Stevenson's 'multifarious denizens' share the same body, like parasites within a host, and the same consciousness—the word 'incongruous' suggesting competition for autonomy. Despite Jekyll's

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<sup>152</sup> Axel Hoffer and Peter T. Hoffer, 'Foreword' *A Phylogenetic Fantasy: Overview of the Transference Neuroses* ed. Ilse Grubrich-Simitis (Cambridge: Belknap Press, 1987) p.ix.

predictions for future scientific dogma however, he only identifies, within himself, two struggling agencies: that of Jekyll and that of Hyde. He identifies them both as being part of himself,

Of the two natures that contended in the field of my consciousness, even if I could rightly be said to be either, it was only because I was radically both (53).

Once separated however, Hyde develops into a separate identity, including name, appearance, and lifestyle. Hyde is even said to 'hate' Jekyll for forcing him to continually return to 'his subordinate station of a part instead of a person' (65). This characterisation suggests that Hyde is actively being repressed, much like the unconscious, but as the narrative continues Jekyll finds it harder and harder to retain control, suggesting increasing tension between the different aspects of Jekyll's psyche. In an article on criminal jurisprudence, M. B. Sampson noted the importance of the delicate balance of the mind when he wrote, 'false impressions, ungovernable desires, deficiencies in intellect or feeling [...] arise from an unbalanced action of the various faculties of the mind.'<sup>153</sup> He then connected imbalance with insanity and evilness, 'the tendency to evil [...] indicates in each the amount of divergence from that harmonious balance [...] in which alone true soundness of mind can exist.'<sup>154</sup> The relevance of this to Stevenson's novel hardly needs demonstrating; Nicola Lacey analyses the novel as a discussion concerning criminal responsibility, with particular reference to the structuring of the

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<sup>153</sup> M. B. Sampson, 'Criminal Jurisprudence Considered in Relation to Mental Organisation' *Medico-Chirurgical Review* (1842) pp.79-81 (p.79) [originally published in *The Spectator*].

<sup>154</sup> Sampson, 'Criminal Jurisprudence' p.81.



narrative as case-notes and Stevenson's own legal training,<sup>155</sup> whilst Stephen Arata discusses it in relation to the construction of criminal deviance and its relationship to professionalism, using Lombroso's *Criminal Man* and Nordau's degeneration theory as access points.<sup>156</sup> Kieran McNally recognises Jekyll and Hyde as employing a metaphor of splitting, present in psychological, philosophical, and fictional texts in the nineteenth century, which signifies the popular recognition of multiple personality disorders and schizophrenia.<sup>157</sup> However, it is the notion that selfhood is constituted by the balancing of the various faculties of the mind that interests me in this discussion.

In Jekyll's wish to 'dissociate' the dual nature of man—in essence a compartmentalising of the self into 'separate identities'—he yearns for greater freedom, to do away with the balancing act entirely: 'the unjust might go his way, delivered from the aspirations and remorse of his more upright twin; and the just could walk steadfastly and securely on his upward path' (53). However, by dissociating the 'incongruous' aspects of his consciousness he creates a power dynamic reminiscent of a parasitic relationship. Hyde although liberated from Jekyll's mental mediation must still share his body, and begins to have a somatic impact on his health. The separation of these dual natures, of which Jekyll claims to be 'radically both' (53), dubs him radically neither. His distancing from his 'other self' is evident in his hatred and fear of Hyde, referring to him as a 'creature', 'a child of Hell', 'He, I say – I

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<sup>155</sup> Nicola Lacey, 'Psychologising Jekyll, Demonising Hyde: The Strange Case of Criminal Responsibility' *Criminal Law and Philosophy* 4(2010)2 pp.109-33.

<sup>156</sup> Stephen Arata, *Fictions of Loss in the Victorian Fin de Siècle: Identity and Empire* (Cambridge: Cambridge University Press, 1996) pp.33-53.

<sup>157</sup> Kieran McNally, 'Schizophrenia as Split Personality/Jekyll and Hyde: The Origins of the Informal Usage in the English Language' *Journal of the History of the Behavioural Sciences* 43(2007)1 pp.69-79.

cannot say I' (63). However, he also 'los[es] hold of [his] original and better self' (59), a transition reflected in the narrator's use of inconsistent pronouns. It becomes increasingly difficult for the reader to distinguish the third agency identified by its distinction from both Jekyll *and* Hyde: 'Between these two, I now felt I had to choose [...] to cast in my lot with Jekyll [...] to cast it in with Hyde' (59). The increasing ambiguity of the narrative voice gestures toward a loss of selfhood; man's composite nature is what constitutes his identity, by attempting to distil it into parts the narrator threatens the very foundations of this. Jekyll even recognises the power of the transformation to do this when he says that the drug 'controlled and shook the very fortress of identity' (54).

The method of division here seems significant. We are told that the house used to belong to a celebrated surgeon and is accompanied by a building 'indifferently known as the laboratory or dissecting rooms' (24). In its previous life, it might have seen the kinds of experiments of Dr. Herbert Mayo, senior surgeon of the Middlesex Hospital, which were reported in the *Medico-Chirurgical Review* under the auspices of determining the 'conditions necessary for consciousness', involving animal vivisection. The experiments explore the significance of the medulla oblongata as the seat of vertebrate perception, determining a starkly materialistic notion of consciousness. The editor of the review narrates the lateral separation of consciousness in the vertebrate animal and suggests that destroying consciousness in one half might still leave it in the other intact. He concludes by posing the question: 'Is it then possible that by exactly severing in the median plane the two halves of

the vitalising segment, a vertebral animal might be made, temporarily, two separately conscious beings?'<sup>158</sup> Conceptually this is just the experiment played out in Stevenson's novel. Jekyll's tastes, however, are 'more chemical than anatomical' (24), so his splitting experiments manifest in very different ways. The swallowing of a compound and subsequent manifestation of another identity within the body has conceptual significance in the popular understanding of parasitic infestation. Between the 1860s and 1890s a series of newspaper articles were published about the dangers of eating sausages. After being discovered by English surgeon Sir James Paget in the 1830s and confirmed by German pathologist Rudolf Virchow—among others—muscle-infesting parasitic worms called *Trichinae* registered high up on the public radar. In 1863, there was an outbreak of Trichiniasis in Hettstadt, Germany, as discussed briefly in the introduction; it was reported in the *British Medical Journal* and republished in several regional and national newspapers.

A few months ago, there was a festive celebration at Hettstadt [...] upwards of one hundred persons sat down to an excellent dinner, and having enjoyed themselves *more majoram*, separated and went to their homes.

Of these 103 persons, mostly men in their prime, eighty-three are now in their graves; the majority of the twenty survivors linger with a fearful malady; and only a few walk apparently unscathed

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<sup>158</sup> 'The Nervous System and its Functions. By Herbert Mayo, F.R.S.' *The Medico-Chirurgical Review, and Journal of Practical Medicine* eds. James Johnson and Henry James Johnson, vol. 37 (London: S. Highley, 1842) pp.18-20. (p.20).

among the living, but in hourly fear of an outbreak of the disease which has carried away such numbers of their fellow diners.<sup>159</sup>

The shocking death toll of the outbreak prompted the author to dub *Trichinella spiralis* as 'a race of parasites more fatal to man and animals than the virus of the blackest pestilence'. The association of parasitic infestation with eating speaks to Jekyll's method of transformation. The descriptions of *Trichinae* infesting muscle, 'they pierce the membranes, enter the fibres, eat and destroy their striated contents [...] roll up in spirals [within the muscles]'<sup>160</sup> has conceptual similarities to the notion that Hyde 'lays caged in [Jekyll's] flesh [...] depos[ing] him out of life' (65). The assertion that 'hepatic, gastric and intestinal disorders or irritations will disturb or even completely destroy, for a time, the *healthy* manifestations of the mind,'<sup>161</sup> further compounds Hyde's place as a parasitic product of toxic ingestion.

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From God-ordained intestinal saboteurs, to allegorical projections of the psyche, parasites provided a natural template for exploring somatic power dynamics. Through its interactions with evolutionary embryology and developmental psychology, medical parasitology became a nexus for the

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<sup>159</sup> 'Recent Outbreaks of Flesh-Worm Disease, or Trichiniasis, in Germany' *British Medical Journal* 1(1864)159 pp.75-77. (p.75) Following this and other similar reports, a series of restrictions were put on the importation of meat, and regional meat inspectors appointed.

<sup>160</sup> 'Recent Outbreaks of Flesh-Worm Disease', p.76.

<sup>161</sup> M. B. Sampson, 'Criminal Jurisprudence Considers in Relation to Mental Organisation' *Medico-Chirurgical Review* (1842) pp.79-81 (p.79).

expression of cultural anxieties pertaining to identity, as well as mental and somatic integrity. Publications about parasitic infestation exposed the terrifying numbers of parasites that could persist in the body and questioned the very notion of bodily ownership and identity: 'there is no pretence more unfounded, or less capable of being sustained, than the right to which man assumes to the *exclusive* possession of "his own body"'.<sup>162</sup> Many nineteenth-century critics still allied parasitic infestation with divine judgement, owing to its long history in the spontaneous generation debate, despite advances that proved this connection to be untenable. Theological engagements with the field positioned parasites as a product of man's imperfect bodies and connected their presence to God's sanction, or a kind of living death linked to biblical punishment:

[Man's body is] a residence for that immortal spirit which its builder has placed within it: but it is not true that that spirit is the only living occupant; many others (our fellow lodgers) are permitted equally to share the right [...] oh! How humiliating to him, to know and consider, that, not only "after he lies down in the dust, shall the worm be spread under him and the worms cover him" but that even during his mortal life "the worm shall feed sweetly on him."<sup>163</sup>

Theological fiction like George MacDonald's *Lilith, a romance* used the motif of parasitism to help explore the notion of mortal sin—explorations that were fused with psychosomatic allegory and placed in dialogue with discussions

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<sup>162</sup> 'Biblical Physics', *John O'Groats Journal*, 30 December 1842, p.4.

<sup>163</sup> 'Biblical Physics', p.4.

about psychological conflict and the nature of the soul. The philosophical frameworks that structured MacDonald's novel were derived, in part, from notions of transcendence common to psychology, philosophy, and developmental evolution. Haeckel's biogenetic law and related theories of phylogenetic recapitulation had a marked influence on ways of thinking about the inheritance of psychic as well as somatic matrices. Psychologists like Freud and Jung interacted with these notions of primal inheritance in order to elucidate the operations of trauma, trace the evolutionary development of the mind, and explain the emergence of neurotic disorders. The germs of such thinking can be read in fiction like Robert Louis Stevenson's 'Strange Case of Dr Jekyll and Mr Hyde', in which the separation between body and mind is directly challenged. The parasite-host paradigm is again employed to explicate the heteronomous nature of the mind and identify the body as a contested locus of identity. The inheritance of 'sin', or of previously adaptive traits that are now considered pathological, is suggested in Jekyll's reference to Hyde as his 'original evil' (54). Hyde's characterisation as selfish and impulsive suggests an affinity with the part of the mind that Freud would later dub the Id. The destabilising power of this seemingly autonomous component of the mind is reflective of anxieties concerning the mutability of the civilised human phenotype. If humans sat on a linear scale with earlier morphological types, what was to stop them regressing like the ascidian to earlier id-centric versions of humanity?

Alfred Russel Wallace outlined this fear in an article on degeneration in 1880, using the biological phenomenon to critique the late Victorian

intellectual milieu and in doing so further compounded the strength of the parallel that many writers were making in regard to psychological development:

It is possible for us—just as the Ascidian throws away its tail and its eyes and sinks into a quiescent state of inferiority—to reject the good gift of reason with which every child is born, and to degenerate into a contented life of material enjoyment accompanied by ignorance and superstition.<sup>164</sup>

The focus on mental licentiousness—on the rejection of reason and later of morals ('what we call evil is the *essential* condition of progress in the lower stages of the development of conscious organisms') as the cause of degeneration—demonstrates the perceived relationship between ethics and intelligence or between conscientiousness and civilisation. The behaviourally induced degeneration presented here, and the somatic overtones evoked by the evolutionary parallel, articulate a number of anxieties concerning mental attitudes and social behaviours at the fin de siècle. These mental attitudes and social behaviours are reflected in the psychosomatic understanding of parasitic invasion and control in literary texts. The causative relationship between parasitism and degeneration presents a dual-threat, both of being *parasitized* (as with Jekyll) and of *becoming* a parasite (as with Lilith). These threats collide in psychological discourse, with parasitic elements of the mind subverting, fracturing, or subsuming one's conscious identity—just as real parasites subsume bodily identity. The crux of this parasite-parasitized

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<sup>164</sup> Alfred Russel Wallace, 'Degeneration' *Science* 1(1880)6 p.63.

entanglement lies in the notion of a hereditary predisposition meeting an environmental trigger: thus immoral or parasitic behaviour might cause a physical or mental degeneration into a parasitic archetype that was already latent in the individual's genetic heredity. As recapitulation theory fell out of favour, and Lamarckian adaptive evolution was replaced with Darwin's Natural Selection, the conceptual framework for a form of retentive primal experience was transferred to the sphere of psychology, where the notion of reconstructing past forms through something akin to embryological study was still tenable. As Freud noted in *Civilisation and its Discontents* (1929):

In the animal kingdom, we hold the view that the most highly developed species have proceeded from the lowest; and yet we find all the simple forms still in existence today [...] This analogy may be too remote, and it is also weakened by the circumstance that the lower species which survive are for the most part not the true ancestors of the present-day more highly developed species. As a rule, the intermediate links have died out and are known to us only through reconstruction. In the realm of mind, on the other hand, what is primitive is so commonly preserved alongside of the transformed version, that it is unnecessary to give instances as evidence.<sup>165</sup>

The retention of primitive types in the mind is the result of bifurcation, writes Freud, explaining that 'a portion of an attitude or instinctual impulse has remained unaltered while another portion has undergone further

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<sup>165</sup> Sigmund Freud, 'Civilisation and its Discontents' (1929) *The Future of an Illusion, Civilisation and its Discontents and Other Works. The Standard Edition of the Complete Psychological Works of Sigmund Freud*, vol. 21 trans. James Strachey (London: Vintage, 2001) p.68.



development' (69). In the development of ancient cities, which he uses as an illustration, he notes that its previous iterations are lost through development: 'the same space cannot have two different contents' (71). Likewise 'in the body of an animal or a human being [...] the earlier phases of development [...] have been absorbed into the later phases for which they have supplied the material', however this is not true of the mind. He argues that 'in mental life nothing which has once been formed can perish [...] everything is somehow preserved and that in suitable circumstances [...] it can once again be brought to light' (69). The modern human condition is thus exposed as unstable, with civilisation being posited as a social construct that might give way to earlier modes of behaviour. The destructive powers of parasites on their hosts, and of parasitic behaviour on individual morphological development ('conditions occurring to an animal which render its food and safety very easily attained, seem to lead as a rule to degeneration'),<sup>166</sup> instigate a re-focusing of attention on human behavioural relationships in the late century, a refocusing that questions the very foundations of selfhood, somatic integrity, and psychic identity.

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<sup>166</sup> Alfred R. Wallace, 'Degeneration' *Science* 1(1880)6 p.63.

## (Re)Constructing the Knights of Science: Parasitologists and their Literary Imaginations

When parasitologist Joseph Dutton died of African Relapsing Fever on 27<sup>th</sup> February 1905, his obituary in the *British Medical Journal* concluded:

He was a true Knight of Science [...] the Galahad of that group of enthusiastic young men who, with so little recompense for themselves, have pushed forward the cause of tropical medical science at such a rapid rate.<sup>1</sup>

The accolade 'Knight of Science' reflects tellingly on the author, fellow parasitologist Ronald Ross,<sup>2</sup> and gestures more broadly to the romanticised construction of scientific expeditions. The implication here is that Dutton, who helped elucidate the aetiology of relapsing fever and discovered one of the causative agents of African sleeping sickness (*Trypanosoma gambiense*), fought on behalf of science, risking his own life to propagate and advance tropical medicine as a discipline. The further appellation 'Galahad' posits

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<sup>1</sup> Ronald Ross, 'Joseph Everett Dutton, M.B., Ch. B. Vict., D.P.H.' *British Medical Journal* 1(1905)2314 pp.1020-1021.

<sup>2</sup> Sir Ronald Ross won the Nobel Prize for medicine in 1902 for his research proving that the anopheles mosquito is a vector for malaria. He was heavily involved in public health and sanitation campaigns for the colonies, and researched a number of other parasitic diseases include kala-azar (visceral leishmaniasis). He campaigned for pensions and remunerations for scientific workers, was a poet, mathematician, novelist and playwright, and the Liverpool School of Tropical Medicine's first lecturer.

Dutton as Sir Galahad and scientific discovery as the holy grail of Arthurian legend. Colonial administrator Sir William McGregor similarly lionised the profession in an address given at the London School of Tropical Medicine<sup>3</sup> in 1900, 'you will in all probability be able to establish the existence of maladies at present unknown and unrecognised [...] can any man desire greater glory?' he asks.<sup>4</sup> The 'glory' associated with scientific research, particularly research in the colonies, was a concept propagated by its association with the broadening of frontiers (both figurative and literal), but—for parasitologist Ronald Ross—an unfulfilled ideal that he struggled with his entire career. This chapter will investigate how much this 'glory' was a true reflection of scientific pursuits and how much it was a constructed cultural image. I will explore the bidirectional dialogue between parasitology and British imperialism, which I identified in the introduction. By investigating the language and imagery used by and about parasitologists and their discipline, I will argue that parasitology emerged as an institution consciously entrenched in British national identity. The myths and legends that parasitologists appropriated in their public and private correspondence became stories about nationhood that sought to instil western scientific authority in narratives of British imperial prowess.

In his *Memoirs* (1923) Ross recalled that '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

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<sup>3</sup> Later: London School of Hygiene and Tropical Medicine.

<sup>4</sup> William MacGregor, 'An Address on Some Problems of Tropical Medicine' *British Medical Journal* 2(1900)2075 pp.977-984.

down to my laboratory and make a discovery!' <sup>5</sup> This unrealistic image of success is precisely the reason he proposes for writing his *Memoirs*, which—the subtitle boasts—includes a full account of 'the great malaria problem and its solution'. However, regarding the public's delusions surrounding the 'man of science' he goes on to say, 'who, but men of science themselves are to blame for such a misconception?' (vi). He criticises the history of discovery as a 'record of results' that eschews 'that sacred passion for discovery that leads to them' (vi). However it is just this 'sacred passion' that we see constructed in discourses related to parasitology and tropical medicine at the turn of the nineteenth into the twentieth century. In *Membranes*, Laura Otis examines the interdisciplinary discourses surrounding the changing concept of selfhood in the nineteenth century, noting the confluence between 'political and biological thinking'. <sup>6</sup> Following the development of microbiology, scientists, she argues, 'assumed the heroic role of soldiers, creators and defenders of empire'. <sup>7</sup> In this chapter I recognise a similar phenomenon in relation to parasitology; however, in addition, I argue that the assumption of this role was largely self-orchestrated.

The adoption of this heroic persona by parasitologists, seen in the use of Arthurian archetypes and metaphors, as well as those of Ancient Greek and Roman mythology, served to romanticise parasitology by grounding it in literary history. The anxieties surrounding selfhood that Otis examines are pertinent to parasitological research, which necessitates, as we have seen,

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<sup>5</sup> Ronald Ross, *Memoirs; with an account of the Great Malaria Problem and its solution* (London: John Murray, 1923) pp.v-vi.

<sup>6</sup> Laura Otis, *Membranes: Metaphors of Invasion in Nineteenth-Century Literature, Science and Politics* (Baltimore: Johns Hopkins University Press, 1999) p.4.

<sup>7</sup> Otis, *Membranes*, p.28.

discussions of self and other as host and parasite. The status of parasitologists as 'creators and defenders of empire' is particularly fitting given their direct and indirect involvement in imperial expansion. The parasite as both an 'other' and a somatic invader threatens the integrity of British selfhood. Stephen Arata recognises the fear that the 'civilised' world might be colonised by 'primitive' forces, which he identifies in late-nineteenth century fiction, as symptomatic of a widespread anxiety concerning the moral, social, and imperial decline of Britain as a global power.<sup>8</sup> This notion of reverse-colonisation, of 'imperial practices mirrored back in monstrous forms',<sup>9</sup> articulates a fear that the western world will fall victim to the dangers of the colonial environment—that western sanitary science will prove ineffective against tropical disease. The dual fears of national and personal usurpation implicate ideas about national identity in the construction of 'self'. Parasitologists, who sought to alleviate the infiltration of British (and colonial) bodies and in doing so strengthened Britain's position as a global power, recognised the significance of this relationship. The infusion of parasitology discourse with British myths about nationhood enabled parasitologists to create public selves that garnered cultural authority.

The instances outlined at the beginning of this chapter gesture toward a stock of metaphors and images that were appropriated by parasitologists and civil servants alike to delineate the place of parasitologists within the wider political framework of nineteenth century England and her colonies. The imagery surrounding parasitology performed multiple functions,

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<sup>8</sup> Stephen Arata, 'The Occidental Tourist: *Dracula* and the Anxiety of Reverse Colonization' *Victorian Studies* 33(1990)4 pp.621-45. (p.622).

<sup>9</sup> Arata, 'The Occidental Tourist' p.623.

including the legitimising of western medical authority, the characterisation of tropical medicine as a prerogative of the nation, and the encouragement of medical students to specialise in this form of training. The parasitologist was a new and hybrid figure at the turn of the century replete with conflicting ideologies and multifarious cultural meanings. To consider this further, in this chapter I will analyse the part that parasitologists themselves had to play in this construction, exploring their scientific and literary output in conjunction with the cultural history in which they were situated.

When parasitologists were gaining their professional status at the turn of the century, two significant movements had risen to prominence in popular culture. The first of these, reflected in the proliferation of colonial adventure stories and the infiltration of empire as a plot device in British horror,<sup>10</sup> Detective, Spy,<sup>11</sup> and Romance fiction, was the shifting power play of England's imperialist agenda. The prominence of tropical diseases and their function as barriers to Britain's expansionism led to the forging of associations between the colonies and parasitology as an emergent discipline. The gathering of knowledge concerning tropical disease aetiologies, their interactions with colonial life and landscape, and their medicinal treatment, directly benefitted the workings of empire. As I outlined in the introduction, concerns over the health of the British Empire—both in terms of day-to-day

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<sup>10</sup> Sage who, arguing that the Gothic is 'the history of a set of cultural responses, not a genre' sees the late nineteenth century as producing a specific iteration of anxiety fiction called 'Empire Gothic'. See: Victor Sage, 'Empire Gothic: Explanation and Epiphany in Conan Doyle, Kipling, and Chesterton' in *Creepers: British Horror and Fantasy in the Twentieth Century* ed. Clive Bloom (London: Pluto Press, 1993) pp.3-23.

<sup>11</sup> Siddiqi recognizes empire as a central plot device in a category of detective and spy fiction, which she calls 'fiction of intrigue'. See: Yumna Siddiqi, *Anxieties of Empire and the Fiction of Intrigue* (New York: Columbia University Press, 2008).

living and the impact of parasitic disease on commercial trade—<sup>12</sup> led to the instigation of the Liverpool and London schools of Tropical Medicine in 1898 and 1899 respectively (the first institutions in the world to specialise in research and training in tropical medicine and parasitology). Consequently the rhetoric of empire became decisively associated with parasitologists and their research, linking the progress of the discipline with the progress of the empire at large. Leading parasitologist and mentor to Ross, Patrick Manson, asserted in 1897 that the systematic teaching of tropical medicine would soon be universal in Britain 'because our country is at the centre of a great and growing tropical empire'.<sup>13</sup> The implication that the success of the imperial project necessitated knowledge of tropical medicine is clear; indeed the *British Medical Journal* asserted in 1898 that 'the enemy of civilisation and colonisation in Africa is not so much Mahdism as malaria'.<sup>14</sup> The importance of parasitologists as facilitators of empire was constructed in relation to their ability to improve the health, and by extension the mental acuity, of its imperial subjects:

In this colossal task of grappling with its mighty destiny, the British Empire will require the best efforts of her myriad sons and daughters. Since a very considerable portion of the Imperial territory is either tropical or sub-tropical, and since the inhabitants of those lands will be

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<sup>12</sup> Two founders of the Liverpool school - Alfred Lewis Jones and John Holt of Elder Dempster and John Holt Shipping, both had established main lines between Liverpool and West Africa or the 'Gold Coast'.

<sup>13</sup> Patrick Manson, 'The Necessity for Special Education in Tropical Medicine' *British Medical Journal* 2(1897)1919, pp.985-989.

<sup>14</sup> 'Medicine in the Tropics' *British Medical Journal* 1(1898)1955, pp.909-10. (p.909).

required to contribute their quota of deliberation and judgement to the solution of the great problem of the race, it follows that he who achieves a triumph in tropical bacteriology is laying one of the stones upon which will rest the everlasting bastions of a strong and vigorous Empire.<sup>15</sup>

The work of parasitologists became synonymous with the building of empire, as William McGregor noted in drawing an analogy between parasitology and construction workers: 'It appears to me to be more or less like this: Manson<sup>16</sup> was the surveyor, Laveran<sup>17</sup> made the road, Ross<sup>18</sup> built the bridges and laid the rails, and Grassi,<sup>19</sup> Bastianelli,<sup>20</sup> Bignami, and Celli provided the rolling stock.'<sup>21</sup> We begin to see the pairing of empire and medicine in ways that imaginatively produce physical connections between the work of parasitologists and the infrastructure of the empire itself.

The second movement to register its prominence was the, by this time well established, medieval revival, following the publication of Tennyson's *Idylls of the King* between 1859 and 1885 (which sold 10,000 copies within the first week), and the first modernisation of Malory's compilation of

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<sup>15</sup> London, LSHTM. RC. Ross/131/01/20. 'Empire Leading Article—Imperial Bacteriology' *The Financial News*, 23 Jan 1913.

<sup>16</sup> Sir Patrick Manson discovered the mosquito vector for the parasitic disease Elephantiasis or Visceral Leishmaniasis.

<sup>17</sup> Charles Louis Alphonse Laveran discovered the protozoan parasite responsible for Malaria.

<sup>18</sup> Sir Ronald Ross traced the life cycle of the *Plasmodium* parasite into the stomach of the mosquito and proved that it acted as a vector for Malaria.

<sup>19</sup> Giovanni Battista Grassi demonstrated conclusively the vector transmission of malaria in humans, and established that only the female *anopheles* mosquito can transmit the disease.

<sup>20</sup> Giuseppe Bastianelli, Amico Bignami, and Angelo Celli studied the clinical symptoms of *Plasmodium falciparum* and recognised several stages in the development of malaria parasite within the blood.

<sup>21</sup> MacGregor, 'Some Problems Of Tropical Medicine', p.980.



Arthur's tales, which had 6 further editions and 5 competitors before the century ended.<sup>22</sup> Many parasitologists consciously negotiated these two movements, appropriating and hybridising imperialist and Arthurian rhetoric in order to construct their professional identities. These appropriations served to position the narrativisation of research discoveries as a cultural investment with mythological significance, a sentiment that finds congruence with Robert MacKay's observation in 1850 that 'A remnant of the mythical lurks in the very sanctuary of science'.<sup>23</sup> The notion that the mythical is always 'lurking' within science suggests that it does not belong there, or is not wanted—left over from the bygone days of pre-science. However, this remnant of the mythical is not just lurking, but fully integrated into the rhetoric of turn-of-the-century tropical medicine. The need to legitimise a newly emerging field of study, in addition to the desire to gain government support and funding, meant emphasis was placed on the need for the profession to engage with wider national interests and to effectively communicate its relevance to medicine—in short parasitologists increasingly needed to sell themselves. By appropriating iconic mythic narratives, parasitologists were able to communicate the practical and ideological importance of their work in ways that spoke to the public's desire for an authoritative, stable, and idealised national identity.

In William McGregor's address at the London School of Tropical Medicine in 1900, he noted the importance of malarial research, which had

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<sup>22</sup> David Staines, 'Tennyson, Alfred Lord' *The New Arthurian Encyclopaedia* ed. Norris J. Lacy (New York: Garland, 1996) pp.446-49.

<sup>23</sup> Robert William MacKay, *The Progress of the Intellect, as Exemplified in the Religious Development of the Greeks and Hebrews* Vol 2 (London: John Chapman, 1850) p.172.

already brought to light 'some of the finest examples of human intelligence, perseverance, and observation, and unveiled some of the most wonderful workings of Nature.'<sup>24</sup>

To myself this chain of marvels, full of poetry and religion, nowhere better seen than in the splendid illustrations of Drs. Ross and Fielding-Ould, always recall the words of the second-greatest Teuton of the century:

How it all lives and moves and weaves  
Into a whole! Each part gives and receives,  
And each to each their golden vessels lend,  
Fragrant with blessing, as on wings,  
From heaven through the earth and through all things,  
Their movement thrusts, and in all harmony it sings! (980)

By linking the 'chain of marvels' to Goethe's *Faust*, McGregor associated scientific research with religion and the pursuit of divine knowledge. The lines he quotes concern the unity and transcendence of nature, as represented by the macrocosm, and reinforce the idea that this unity is inherent in scientific observation. What Faust perceives in the philosophical idea of interconnected nature, McGregor perceives in the diagrams of *Plasmodium* lifecycles (drawn by parasitologists Ross and Fielding-Ould). He goes on to compare the elucidation of the life cycle of the microscopic malaria parasite,

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<sup>24</sup> McGregor, 'Some Problems of Tropical Medicine', p.980.

*Plasmodium spp.*, with the discovery of gold in Australia, the pinpointing of the position of Neptune,<sup>25</sup> and the location of the cycle of the 'Demon star' Algol.<sup>26</sup> This sets up a series of points of reference with increasing amplification: cellular, global, planetary, and galactic. Here we see a reinforcement of the unity of nature in the mirroring of systems at different levels of existence: the microscopic world, to his mind, is just as complex and elegant as the orbits of the universe. This microcosmic rhetoric complements the conflation of body and landscape (common to medical cartography and imperial romance) that was increasingly being used by parasitologists to visualise and communicate the movements of parasites within the body. Helminthologist T Spencer Cobbold used the metaphor to describe the lifecycle of parasitic worms:

[Entozoa are] a peculiar fauna, destined to occupy an equally peculiar territory. That territory is the widespread domain of the interior bodies of man and animals. Each animal or "host" may be regarded as

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<sup>25</sup> Before the discovery of Pluto in 1930, Neptune was considered the furthest known planet, and thus its discovery in 1846 was considered to push at the boundaries of the known universe. However, more importantly, the position of Neptune was mathematically predicted before it was observed, suggesting a logical pattern to life, which Benjamin Gould held as 'utterly unparalleled in the whole history of science', a phenomenon imbued with 'romance and poetry'. Benjamin Apthorp Gould, *Report on the History of the Discovery of Neptune by Benjamin Apthorp Gould Jr.* (Washington City: Smithsonian Institution, 1850) pp.3-4.

Interestingly, Ross invokes this same parallel between the discovery of Neptune and the discovery of the *plasmodium* lifecycle in his *Memoirs*, published in 1923. However in this case he uses the comparison to weaken Manson's claim over the mosquito-malaria theory: 'Really the only point of exigency in Manson's hypothesis was the single fact that the process of "ex-flagellation" never occurs until about ten minutes after the blood is drawn (and kept liquid) thus suggesting that it is meant to occur in the stomach of some suctorial insect [...] it was not a mathematical induction like that of Leverrier and Adams regarding Neptune, but only a strong biological working hypothesis.' Ronald Ross, *Memoirs; with an account of the Great Malaria Problem and its solution* (London: John Murray, 1923) p.131.

<sup>26</sup> Algol, the so called 'Demon star' or 'blinking demon', probably gains its name from the fact that the variability in its brightness made it look like a giant blinking eye peering down at the Earth. In 1782 Goodricke advanced the eclipse theory to account for these fluctuations in brightness and in 1880 Pickering reaffirmed the theory. Vogel confirmed it unquestionably in 1889, identifying Algol as a binary pair undergoing mutual eclipses. William Tyler Olcott, 'Perseus, the Champion' *Star Lore: Myths, Legends and Facts* (New York: Dover Publications, 2004) p.303.

a continent, and each part or viscus of his body may be noted as a district.<sup>27</sup>

Parasitologists Ross and Manson use the same conflation of body and landscape when talking about their research as a metaphorical journey. In letter correspondence with Manson, Ross insists that he will 'follow the flagella' and 'pursue the plasmodium', paralleling symbolically the parasite's migration through its hosts, the letters themselves on their travels from Ross in India to Manson in England, and the expeditions of King Arthur's knights. Using the trope of the hero's journey, he compares research to expedition by setting up parallels between the movement of parasites between and within hosts, and the conquest of foreign lands. Manson reiterates this use of the quest motif in a letter dated 21<sup>st</sup> June 1895:

I look forward to receiving [your 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 fallen sick, or that you had got a check, or that you had given up the quest. Above everything, don't give it up. Look on it as a Holy Grail and yourself as Sir Galahad and never give up the search.<sup>28</sup>

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<sup>27</sup> Cobbold, *Entozoa: an Introduction to the Study of Helminthology*, p.4.

<sup>28</sup> Patrick Manson, 'Letter 11. 02/004' in *The Beast in the Mosquito: the Correspondence of Ronald Ross and Patrick Manson* eds. W.F.Bynum and Caroline Overy (Amsterdam: Rodopi, 1998) pp.31-33 (p.31).

The quest motif is one that characterised the parasitology brand. As we have seen, Ross would use the Galahad reference when eulogising Joseph Dutton in 1905. 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 brand to parasitologists (in addition to the general public) and an internalisation of this narrative by its proponents.<sup>29</sup>

The success of this narrative relied on the cultural association between Arthurian legend and British expansionism, and significantly, the idea of an historically revered homeland from which to govern. Stephanie Barczewski suggests that supporters of British imperialism used the King Arthur legend to demonstrate that 'Britons have for centuries looked outwards towards their burgeoning empire and territorial expansion', associating a celebrated and venerated history with a promising Imperial future.<sup>30</sup> In a bid to demonstrate this effect, she identifies the prominence of the sea (fundamental to colonial travel and trade) in nineteenth-century reinterpretations of Arthurian romances. The popularity of this motif in Arthurian adaptation connects mythic movements with imperial endeavour. She suggests a correlation between the increasing markets for tourism in Cornwall (Arthur's homeland) with this valorisation of the ocean.

The alleged site of King Arthur's birth at Tintagel and his death at Camelford both situate these significant events in Cornwall, a place where the sea is a constant intruder. In 1851, Rev. R. B. Kinsman renovated the path to the headland where Arthur's castle stood. Kinsman's renovations meant that

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<sup>29</sup> This appears to represent a conscious attempt to universalize the brand amongst its members.

<sup>30</sup> Stephanie L. Barczewski, *Myth and National Identity in Nineteenth-Century Britain* (New York: Oxford University Press, 2000), p.201.

it was made truly accessible to the general public for the first time. This coincided with an increase in railway infrastructure in the south west, stimulating the development of a vigorous tourist industry involving a previously isolated part of England, which came to be known as 'the land of King Arthur'.<sup>31</sup> This new tourist destination helped to compound the association between Arthurian legend and the sea, influencing nineteenth century reinterpretations and their connections to current pursuits of empire. Parasitologists appropriated and reinforced this connection. By representing themselves as embarking on ocean expeditions to explore unknown lands and fighting to protect the empire with science, parasitologists ensured that they inhabited an allied heroic position. Owing to the allegorical construction of parasitological research, they retained the overtones of imperial romance in describing their work, even when not taking part in scientific expeditions. By analysing the bodies of patients, already established to parallel allegorically the colonial landscape, scientists—like explorers—might find '*treasures* that for ages have been missed,' wrote one reviewer in the *Annals of Tropical Medicine and Parasitology* in 1910.<sup>32</sup> Indeed the imperial romance with its characteristic quest format and treasure-seeking British adventurers<sup>33</sup> can be mapped almost directly onto publications regarding expeditions by the Liverpool school to Sierra Leone. *The West African Mail*, for example, reported on their efforts to uphold health and sanitation in West Africa under the

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<sup>31</sup> Barczewski, p.204.

<sup>32</sup> 'Annals of Tropical Medicine and Parasitology by The Liverpool School of Tropical Medicine' *British Medical Journal* 2(1910)2595, p.880.

<sup>33</sup> See: Robert Dixon, *Writing the Colonial Adventure: Race, Gender and Nation in Anglo-Australian Popular Fiction, 1875-1914* (Cambridge: Cambridge University Press, 1995) p.62.

emotive title: 'The Crusade against Tropical Disease and the Liverpool School of Tropical Medicine'.

Press publications upheld these connections by also situating parasitology within a mythic narrative: 'Old legends and fairy-tales tell us of battles with giants and dragons; modern medical science tells us of battles with microbes too small to be seen,' wrote one author for *The West Australian* in an article about the 'deadly' mosquito.<sup>34</sup> The Arthurian framing was kept alive through conscious press characterisation, as in this tribute to Ronald Ross, written by fellow parasitologist William G. MacCallum:

"Sir Gawain asked the knight if he knew any adventures in that country. 'I shall show you some to-morn' said the old knight, 'and these marvellous.' So on the morn they rode into the forest of adventures." The forest of adventures for Sir Ronald Ross—then plain Major Ross of the Indian Medical Service—was the teeming insect life of India. At Secunderabad, on August 20<sup>th</sup> 1897, he made an epoch-making step into the unknown.<sup>35</sup>

The narration of a valiant knight hungry for adventure, and the colonial landscape as the land fit for this pursuit, positioned the tropical researcher as both chivalric and fearless, risking his life in the colonies for the glorification of his homeland. This image highlights bravery as an attribute of the

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<sup>34</sup> W.G.M, 'The Deadly Female. Murder that Mosquito!' *West Australian*, Saturday 15 February 1938, p.5.

<sup>35</sup> William McCallum, 'Science and Poetry. Work of Sir Ronald Ross' *West Australian*, 13 February 1932, p.5.

parasitologist. A correspondent for the *Daily News Weekly* compounded this conferral of bravery: 'of a bright and jaunty disposition Major Ross regards a visit to the swamps of West Africa as he would a trip to Paris.'<sup>36</sup> The parasitologist was the valiant knight, the brave explorer, the conquering general, and the mythic hero all rolled into one, and bore cultural significance as the facilitator of progress. As Ross insisted in an article published anonymously in the *British Medical Journal* in 1906, 'He [the discoverer in science] serves not only one people but the whole world, and not only one generation but all time. Without him the inventor would not succeed, and the general, very often, not conquer.'<sup>37</sup> The success of empire was tied so thoroughly to the work of parasitologists that an article concerning 'the prosperous and progressive future of the British Empire' even referred to malaria with the adjective 'anti-imperial'.<sup>38</sup> Ross, by extension, was posited as distinctly pro-imperial; working to conquer malaria, he was billed as a literal empire-builder:

Mr. Ure, when Lord Advocate, was fond of saying up and down the country that nobody could add an acre to the land originally given to us by the Creator. As a saleable and inhabitable commodity, I wonder how many acres Sir Ronald's discoveries have added to the map of the

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<sup>36</sup> 'A Malaria Expedition to West Africa. Interview with Major Ross' *Daily News Weekly*, 5 August 1899, p.4.

<sup>37</sup> 'A British Nobel Prize' *British Medical Journal* 2(1906)2397, pp.1667-68 (p.1667).

<sup>38</sup> 'Empire Leading Article—Imperial Bacteriology' *Financial Times*, 23 January 1913, n.p.



empire? [...] engaged in his gigantic fight with the pigmy jungle foes of man.<sup>39</sup>

This characterisation of Ross's adversaries situated malaria firmly in tropical territories, despite its prevalence in Italy, Greece, and elsewhere in Europe. The appellation 'pigmy' referred to both a race of people of short stature in Central Africa and South East Asia, and to diminutively small objects and animals. This double meaning and addition of 'jungle' posited Ross's fight as against the colonial landscape, as well as its pathogens (and even its people), reinforcing the sanitising rhetoric of British Imperialism.

At the Nobel Prize reception for Ross in 1902, he was described as 'a hero from Africa who had been occupied in a war, not against his fellow men, but against a most insidious enemy to mankind.'<sup>40</sup> The branding of Ross as a 'hero' against an 'insidious enemy'—malaria—cast Ross as a saviour; Alfred Lewis Jones then compounded this image by talking about the debt to 'all those brave men who had gone into such countries with the object of improving the conditions of life for their fellow-men.' He insisted:

Such work is not of a selfish character; it was not merely a national movement, it benefited the whole world; and men such as Professor Ross made the countries better, not only for those who belonged to

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<sup>39</sup> Henry Faulds, 'The Reward of Research' *British Medical Journal*, 1(1914)2781, p.888.

<sup>40</sup> 'Liverpool' *British Medical Journal* 1(1903)2192, p.48.

them, but better for people of other nations who went to them, and in this way the whole world was benefited.<sup>41</sup>

In this high praise we might see another attempt to glorify the profession by connecting the expansion of the British Empire with the improvement of the globe at large. The emphasis on the impact of individual researchers created a story with memorable protagonists who formed the public face of the discipline. These protagonists were in turn part of multiple narratives—narratives of colonial medicine, public health, and professional development. The construction of the 'one-man' narrative was often accompanied in the lay-press with hyperbolic descriptions of adversity, which exaggerated the immediacy of the danger:

His [Ross'] research took him into the deadliest districts of West Africa, where for months he risked his life, every hour, night and day, for the cause of medical science and humanity.<sup>42</sup>

The bravery of individual researchers was similarly hyperbolised:

Dr. Sambon, Director of the new [Parasitological] department, was one of several scientific heroes who deliberately lived in a hut over an

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<sup>41</sup> 'Liverpool' *British Medical Journal* 1(1903)2192, p.48.

<sup>42</sup> 'Martyrs to Science. Medical Men's Toll of Life' *Cape Argus*, 14 Dec 1912, n.p.

ancient tomb (from which a skeleton was taken) in the swampiest part of Rome.<sup>43</sup>

By exaggerating the inadequacy of the resources, such descriptions contributed to the glorification of the individual researcher's personal abilities:

The best of professor Ross's work had been done in a hut with a microscope, two needles and a matchbox.<sup>44</sup>

The glorification of the individual allowed—even encouraged—the divulgence of personal details otherwise denied to the reader of scientific research. This facilitated a familiarity with the figure that cultivated the potential for celebrity. Offering commentary on the character of the individual, publications often translocated the researcher's scientific accomplishment onto their endeavours at large, or else looked for the preconditions of success in their physical and mental constitutions. The *Children's Newspaper* for example, under the title: 'Men you will hear of when you grow up', described Ross as 'a man of genius whose heart is charged with music and sunshine, as his brain is charged with colossal ideas'.<sup>45</sup> The newspaper purported that Ross had single-handedly solved the malaria problem, 'while the rest of the world were sleeping,' reinforcing the idea that one individual could change the world. Increasingly, the parasitology narrative blurred into myth, and ever more

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<sup>43</sup> London, LSHTM. RC. Ross/113/23/42. Cutting: 'Perilous Pets' *Daily Dispatch*, n.d, n.p.

<sup>44</sup> 'Special Correspondence' *British Medical Journal*, 1(1903)2196, pp.285-286. (p.286).

<sup>45</sup> 'Men You Will Hear Of When You Grow Up', *Children's Newspaper*, 6 December 1919, p.4.

diverse groups participated in the construction of that myth.

Ross received correspondence from doctors seeking advice, researchers in allied disciplines congratulating him, would-be patients wanting diagnoses, and even fans wanting autographs. One correspondent sent him a poem she had written which talks about the impressive sight of Ross and colleague Lt. Col. Stephens crossing the Liverpool University quadrangle. As they cross the quad to reach the Thompson-Yates laboratories, 'haughty arts men' watch them enviously, 'with noses pressed against the glass', and engineers are shamed by such an 'inspiring sight'. It begins:

Here come—now, glory be to God!  
The colonels twain across the quad  
And one is dreamy, pale and long  
And one alert, and brown, and strong.<sup>46</sup>

Just as fellow parasitologists Kinghorn and Montgomery were described by one newspaper as 'fine specimens of British manhood', Stephens and Ross took on, in the public imagination, the physical attributes of heroic figures.

In an article concerning the aetiology of kala-azar<sup>47</sup> Surgeon-Major Giles used a reference to Alexander the Great to lampoon a colleague's

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<sup>46</sup> London, LSHTM. RC. Ross/146/19/26. Poem sent by Miss Allman, 23 February 1919.

<sup>47</sup> A parasitic infection also known as visceral leishmaniasis. (See Glossary of Terms). The causative agent—the protozoan parasite *Leishmania donovani*—was isolated independently by Charles Donovan and William Leishman in 1903. Before this, the disease was thought to be a complication of malarial infection (even a quinine-resistant form of malaria) – a position that many thought was untenable owing to the fact that K.A. was infectious, while malaria was not. (Both however were found to be transmitted by insect vectors – sandfly and mosquito respectively – and thus neither truly infectious.)

suggestion that the disease was caused by malarial infection complicated by the presence of ankylostomes:

An ordinary man would indeed see at once that such a position is untenable, but Dr. Rogers, like a medical Alexander, cuts his Gordian knot by announcing that Assamese malaria is infectious. In this he places himself at variance with not only the scientific, but the popular opinion of the entire world.<sup>48</sup>

Here Giles characterises Rogers's solution to the problem of kala-azar as analogous to Alexander the Great's severing of the Gordian knot. This analogy is a poignant one, which itself requires some unpicking. The theory advanced by Rogers was flawed, owing to its predication on malarial poisoning, which was not infectious, unlike kala-azar. However Rogers posits a solution: Assamese malaria is a special variety of the disease, which *is* infectious. Giles points out the short-sightedness of this position; while it indeed reaches a solution, it is not backed up by evidence and thus is like cutting the knot, rather than untying it. The use of the Gordian myth reinforces the notion that parasitologists understood their profession using mythic narratives, however the departure from Arthurian rhetoric perhaps suggests an imaginative hierarchy. Alexander the Great, leader of the Macedonian Empire, was indeed a figure of imperial might, comparable to the leaders of the Roman, Byzantine,

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<sup>48</sup> G. Giles, "The Etiology of 'Kala-Azar'" *Indian Medical Gazette* 33(1898)1, p.1.

and Mughal<sup>49</sup> Empires. Reference to such figures invoked past histories as models for the British pursuit of empire. Significantly, the decline of these great empires was attributed to tropical disease:

The extraordinary collapse in politics, art, literature and morals, and all that constituted "the glory that was Greece" is now believed to have been caused by malaria, which was very probably also the main reason why "the grandeur that was Rome" gradually became dimmed, and the once-potent Roman Empire sank to a level of a tenth-rate power. The sword of the Roman legionary was as sharp as ever, but it could not parry the thrusts of the mosquito's rapier.<sup>50</sup>

Where these empires failed Britain would not because the nineteenth-century model was endowed with a secret weapon—tropical medicine. Unlike the great empires that came before, Britain's focus was on successfully colonising (rather than simply conquering) and thus on effective and lasting solutions to the problems of parasitic disease. For Giles, this success was analogous to unravelling (rather than cutting) the Gordian knot.

Ross, in a 1916 article in *Science Progress*, commented on the efficacy and function of such mythologisation:

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<sup>49</sup> Patrick Brantlinger notes, when discussing Tennyson's 1892 poem *Akbar's Dream*, that 'Akbar is an Oriental King Arthur,' and suggests that Tennyson uses this parallel to prophesize the triumph of the Empire: 'The great work he [Akbar] has begun of civilizing the Indian wilderness will collapse, but the British will take it up again and complete it on a permanent basis.' Patrick Brantlinger, *Rule of Darkness: British Literature and Imperialism, 1830-1914* (Ithaca: Cornell University Press, 1988) p.10.

<sup>50</sup> W. G. M, 'The Deadly Female. Murder That Mosquito!' *West Australian*, Saturday 15 February 1938, p.5.

The only manner in which science can be taught to men is by way of narratives of events which, though they may not actually have occurred as described, are occurring over and over again in history and in our lives—just as Euclid's book was the first to crystallise geometry in sets of definite propositions with figures which are never actually found in nature.<sup>51</sup>

Arguing for the necessity of these kinds of semi-fictitious narratives, he noted: 'the constructions of the men of science [...] have to be idealised, partly for brevity and partly for fixing the attention of the public,' a sentiment that appears to justify the widespread adoption of myth in the reporting of parasitology research. He elaborated on this relationship by suggesting that science relied on art for its 'presentment'. He argued that 'the great histories and biographies, as well as other epics and novels, belong to the same class of work' as those of science—that is—work that aimed at educating the public. The blurring of these different kinds of writing, or indeed the use of art to facilitate a transfer of knowledge can be seen in the obituary of Walter Myers, published in *The Financial News* in 1913. Myers, a parasitologist, who died of yellow fever while working for the Liverpool School of Tropical Medicine, was remembered with a brief memorandum of his life and work, which ended with the line: 'The Rest is Silence'. Not content with this reference to Hamlet,

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<sup>51</sup> Ronald Ross, 'Homer, Dante, Shakespeare, and Cervantes' *Science Progress*, 11(1916)41, pp.137-40. (p.137).

the *Financial News*, in republishing the memorandum, saw fit to add the following lines from Tennyson's *In Memorium*:

*So here shall silence guard his fame;  
But Somewhere, out of human view,  
Whate'er thy hands are set to do,  
Is wrought with tumult of acclaim.*<sup>52</sup>

These literary additions compound the integral function of art in helping to frame scientific figures and their achievements. Ross recognises the place of art in the public understanding of science, seemingly advocating the conscious literary framing that I argue characterised parasitology. In my third chapter, I discuss the use of parasitic disease in fiction to critique disciplinary methodologies and politics, as well as the ideologies that underpin them, but first I will explore the use of Greek and Roman mythical frameworks in more detail.

### **The Descent into the East: Stigmatised Tropical Landscapes and their Mythological Counterparts.**

Owing in part to the emphasis on classics in the education system in the nineteenth century, and in part to the perception of Classical Greece as

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<sup>52</sup> Alfred Tennyson, from 'In Memoriam A.H.H' quoted in 'How to Assist Tropical Medical Work' *Financial News*, 23 January 1913. n.p. [italics in original]



providing the foundations for western civilization,<sup>53</sup> ancient Greek mythology formed another reservoir for medical analogy. The mythic Greek hero provided a connection to past civilisations and empires, myth being for the Ancient Greeks 'the major formative power of cultural progress'.<sup>54</sup> Indeed, Frank Turner argues that for the Victorians, Greek civilisation represented not 'the Ancients', but 'distant contemporaries who had confronted and often mastered the difficulties presenting themselves anew to the nineteenth century'.<sup>55</sup> To this end, their myths were repurposed for scientific analogy, the mythic hero often being fused with the Knight Errant (a figure associated with Britain's Arthurian myths of nationhood) to better represent the tribulations of the British Empire. In 1898, Dr. Luigi Sambon used a figure from Greco-Roman mythology to symbolise what, to his mind, was the greatest obstacle to African colonisation.

But there remains the great tropical belt, with its vast and rich territories extending over more than a third of the surface of the globe. This, surely, must be the Promised Land; but we dare not enter, because at its gates stands a terrible monster—the Cerberus of prejudice.<sup>56</sup>

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<sup>53</sup> Turner argues that the classical world was at the heart of Victorian intellectual thought. See: Frank Turner, *The Greek Heritage in Victorian Britain* (London: Yale University Press, 1981) p.xii.

<sup>54</sup> Walter Burkert, *Structure and History in Greek Mythology and Ritual* (Berkeley: University of California Press, 1979) p.xii.

<sup>55</sup> Frank Turner, *The Greek Heritage in Victorian Britain* (London: Yale University Press, 1981) p.xii.

<sup>56</sup> L. Westernra Sambon, 'Acclimatization of Europeans in Tropical Lands' *The Geographical Journal* 12(1898)6, p.589-99. (p.589).

Sambon uses this analogy to dispel erroneous notions that Africa could not be colonised by 'the white man' owing to geographical or ecological incompatibility. He is referring specifically to the popularly held connection between tropical climate and disease: 'It is the almost universal opinion that the European cannot colonise the tropics, but must inevitably fall, sooner or later, a victim to the influence of their deadly climate'.<sup>57</sup> However, he goes on to point out the folly of this connection,<sup>58</sup> highlighting the importance of new medical knowledge:

One time, undoubtedly, these diseases were attributed to the direct and sole agency of solar heat, just as malarial fevers were attributed to the moonshine; but now they have been inscribed deeply on the tablets of bacteriology, and certainly the demonstration that disease belongs to the domain of parasitism is the greatest advance that medical science has ever made.<sup>59</sup>

Sambon's use of Cerberus to dispel this notion is intriguing because it is problematic. Cerberus is a familiar character from Greek mythology: the fearsome three-headed, serpent-tailed hound that acts as gatekeeper to the Underworld. Certainly this is an effective metaphor for the obstructions of prejudice. Sambon's use of Cerberus, however, characterises the tropics as the Underworld and the journey across the Atlantic as tantamount to crossing

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<sup>57</sup> Sambon, 'Acclimatization of Europeans in Tropical Lands', p.589.

<sup>58</sup> He is in fact so against this climatic connection that he insists 'sunstroke' is not caused by exposure to the sun, but is an infectious disease!

<sup>59</sup> Sambon, 'Acclimatization of Europeans in Tropical Lands', p.590.

the river Styx (a formidable stretch of water that separates the Earth from the Underworld).

Indeed, the absence of light in the Underworld might find congruence with the naming of the 'dark continent'. That said, Sambon also refers to the tropical belt as 'the promised land' perhaps to draw an analogy to the belief, expressed in the Aeneid, that Elysium was located in a special region of the Underworld.<sup>60</sup> Thus Elysium symbolises the potential wealth and resources in the tropics, which can only be found by persevering through the barrenness of the African continent, in turn symbolised by the Underworld. However, before the British can find Elysium (or happiness in Africa) they must first lull to sleep the Cerberus of Prejudice,<sup>61</sup> that is, dispel the notion that the tropics are uninhabitable. Significantly, Patrick Manson uses the same analogy in 1907; however, his Cerberus was not prejudice, but disease: 'The Cerberus that guards the African Continent, its secrets, its mystery and its treasure is disease... (which I would liken to an insect).'<sup>62</sup> The final clause suggests that Manson refers specifically to parasitic diseases, many of which have insect vectors.

Manson's and Sambon's gatekeepers are effectively one and the same; the prejudiced notion that Africa is uninhabitable to the white man stems

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<sup>60</sup> Robin Hard, 'The Brothers and Sisters of Zeus' *The Routledge Handbook of Greek Mythology* (London: Routledge, 2004) p.117.

<sup>61</sup> The sibyl accompanying Aeneas on his journey through the Underworld puts Cerberus to sleep by tossing him a drugged honey cake, whilst Orpheus uses a harp to lull Cerberus into submission when he descends to the Underworld to rescue Eurydice. Elizabeth Webber and Mike Feinsilber, eds. 'Cerberus' in *Merriam-Webster's Dictionary of Allusions* (Springfield: Merriam-Webster, 1999) p.107; George William Cox, 'Orpheus and Eurydice' *Tales from Greek Mythology* (London: Longman, Green, Longman and Roberts, 1861) p.20.

<sup>62</sup> Patrick Manson, quoted by Sheldon Watts in 'Yellow Fever, Malaria and Development: Atlantic Africa and the New World, 1647 to 1928' *Epidemics and History: Disease, Power and Imperialism* (Bath: The Bath Press, 1997) p.213.

from an association between the climate and disease. Both regarded the taming of disease as the key to colonisation. Uniquely Sambon advocated a disassociation between heat and disease, which he deemed not to be causatively linked. As the *British Medical Journal* reported in 1897: 'Like everyone else, Dr. Sambon recognises two [obstacles to tropical acclimatisation] heat and disease. But he differs from almost everyone else in accentuating the fact that these two are [...] independent of each other; in fact entirely distinct.'<sup>63</sup> This dissociation dispelled the notion that the tropics were noxious and deadly environments in and of themselves, suggesting that a third factor (the parasite) is what causes disease, and thus what might be overcome by Europeans. Man could not change the tropical climate, but he might be able to avoid parasitic infestation, and thereby achieve acclimatisation. In this way, parasitologists were again indirectly valorised by their insistence that the only thing standing in the way of European acclimatisation was parasitic disease, and by extension the only ones able to grant acclimatisation were parasitologists.

The transformative powers of parasitology and its allied practices of public health and sanitation were an integral part of the parasitology brand—a highly politicised mythology constructed by and about its proponents. This construction can be seen in the correspondence between Ronald Ross and Lord Lever (later Leverhulme)—benefactor of the Liverpool School of Tropical Medicine and manufacturer of Sunlight Soap. Lever wrote to Ross in 1911 to inform him that he had received a drama in one act, anonymously

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<sup>63</sup> 'Europeans in the Tropics' *British Medical Journal* 1(1897)1880 pp.93-94. (p.93).

signed, which had St Peter send 'a soap-maker', billed as the chair of the School of Medicine,<sup>64</sup> and 'a scientist', who 'made a great discovery', to Hell. He enclosed the play and composed a second act, which he provided under the authorship of 'a certain soap-maker' who 'often gives rise to reflections'.<sup>65</sup> The scientist represents Ross, and the soap maker, Lord Lever,<sup>66</sup> and given the subtitles: 'By a scientist' and 'By a soapmaker' respectively, it seems likely that Ross composed the first act and Lever the second. The gathering of applicants who are 'mostly from Liverpool, Shipowners, Professors, Business Men and so on' compounds this by situating the drama in dialogue with the Liverpool School of Tropical Medicine and its proponents.<sup>67</sup> The first act takes place at the 'Gates of Paradise' where St Peter is reviewing the applicants for admittance to heaven. After meeting a Parson and sending him to Hell for the insincerity of his prayers and his failure to convert anyone to Christianity, St Peter is met with a scientist.

St Peter:       [....] Next. Who are you?

Scientist:       A poor man of science, Sir.

St Peter:       Oh! I don't understand that lot. What has he done?

Secretary:      He made a discovery once, Sir – many years ago.

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<sup>64</sup> I speculate that this refers to the Liverpool School of Tropical Medicine owing to the context given by Ross and Lever's correspondence.

<sup>65</sup> London, LSHTM. RC. Ross/113/20/05. Lever to Ross, 27 December 1911.

<sup>66</sup> William Lever was an English industrialist and philanthropist best known for manufacturing (with his younger brother) "Sunlight Soap" – a business that relied on palm oil supplied by the British Empire.

<sup>67</sup> From the tone of the correspondence and the details of the play, which take place "Christmas 19--" and conclude with many LSTM members getting into Heaven 'because it is Christmas Day', I suspect the first act was sent by Ross to Lever as a private joke.

St Peter: Ah yes, I've read about it in our Science Jottings. And what has he discovered since then?

Secretary: Nothing, Sir.

St Peter: Monstrous! Why not? Why haven't you used your talent?

Scientist: Please, Sir, I have had to spend all my time writing letters, attending committees, and dining with the next applicant; so that I have had no leisure to think and work properly.

St Peter: Rot! Down you go. Fifth class [...] <sup>68</sup>

These lines might be read as an allegory for the mistreatment of scientists and the lack of understanding on the part of general public, a reading which is supported by Ross's campaigns for better recognition and remuneration for scientific workers. The speed with which St Peter dismisses the scientist's discovery suggests both a belittling of the significance of his research, and a lack of understanding of the political nuances of such work. Scottish scientist Henry Faulds, commenting on Ross' remuneration campaign, captured the sentiment behind this interaction when he asked:

Why should only well-paid warriors, diplomats and civil servants be additionally required for often purely conventional services, while those who painfully penetrate with ultimate success into the unknown,

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<sup>68</sup> London, LSHTM. RC. Ross/113/20/07-08. 'The Gates of Paradise', 27 December 1911.

but fertile regions receive nothing for their expenses, and often not even the barest form of thanks?<sup>69</sup>

Alternatively the interaction might be read as a sincere criticism of the amount of time spent reaping the rewards of discovery at dinners and committees, by someone who, either seriously or teasingly, Lever accuses of 'lay[ing] sacrilegious hand on the scientist.'<sup>70</sup> Either reading, however, suggests a disparity between the perspectives of the workers of the Liverpool School of Tropical Medicine and their political reception at large. Faulds' notion of scientists as penetrating into the unknown and subsequently transforming the tropical landscape is played out in the second act, which has the scientist, parson, and soap-maker descend into the deepest regions of Hades. A conversation with 'his Satanic majesty' reveals that the Underworld has been transformed owing to St Peter's dislike of scientists, whom he sends to Hell, and who then proceed to improve it beyond recognition.

His Satanic Majesty:           The fact is we get so many distinguished scientists that they are improving the place entirely out of my recollection. They introduce Town Planning Schemes, Garden Cities, Art Galleries, Museums; to say nothing of Tropical Wards, Scientific

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<sup>69</sup> Henry Faulds, 'The Reward of Research' *British Medical Journal*, 1(1914)2781, p.888.

<sup>70</sup> London, LSHTM. RC. Ross/113/20/05. Lever to Ross, 27 December 1911.

Medical Research and other  
advancements.<sup>71</sup>

The transformative powers of scientists are here made apparent. Parallels with the tropics are upheld by way of references to 'climate' (which has of course been improved by the scientists in Hades), and by references to other markers of colonial space.<sup>72</sup> The journey to Hades takes place by train, perhaps nodding to the railway infrastructure of the colonies, a seminal factor in the successful colonisation of central Africa. Satan facilitates further comparison when he says:

The very men who invented mosquito proof curtains have introduced here fire proof curtains [...] and there is one distinguished scientist connected with the Liverpool School of Tropical Medicine, whom we are expecting here shortly and whom we have good reason to believe has succeeded in inducing a very wealthy Baronet, living in the South of England somewhere near Ascot, to fit up a cold chamber on the Haslam Improved System.<sup>73</sup>

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<sup>71</sup> London, LSHTM. RC. Ross/113/20/07-08. 'The Gates of Hades', December 1911.

<sup>72</sup> Furthermore, Ross's assertion that '[Africa] is mostly an empire of graveyards, a kingdom over tombstones' allegorically links the colonies with Hade's underworld. London, LSHTM, RC. Ross/67/08. Ronald Ross, 'A Recent Medical Expedition to West Africa' Lecture delivered at the Liverpool Chamber of Commerce on 27 Nov 1899.

<sup>73</sup> London, LSHTM. RC. Ross/113/20/07-08. 'The Gates of Hades', December 1911.



This likely refers to Ross's work studying the effects of cold on animals (and people) infected with trypanosomiasis (African sleeping sickness).<sup>74</sup> A cold chamber, made by Sir Alfred Haslam, was erected at the University around this time, paid for by Sir Edwin Durning-Lawrence.<sup>75</sup>

The parallels with recognisable real-life developments, like the implementation of mosquito nets in the tropics and the construction of the cold chamber at Liverpool, situate the drama firmly in dialogue with the politics of the discipline. In their letter correspondence, Lever and Ross exchange veiled compliments, which—given the parallels discussed here—suggest they see British Imperialism, or at least the work of the Liverpool school (of which Lever was a benefactor), as a sanitising and transformative force. Their dramatic counterparts bleed into real life and their public personas are imbued with Underworld mythology: 'You make me blush when you talk about the Ignominious soapmaker improving Hades. It is the new departure in Town Planning being carried out by men of science headed by R..... R...'<sup>76</sup> The private nature of this mythologisation provides further strengthening for my contention that the brand was internalised by its proponents, as suggested earlier by the correspondence between Manson and Ross.

The reality of research is gestured to by the interactions of the first act. The transformative power of parasitologists, exemplified here, is an

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<sup>74</sup> See: London, LSHTM. RC. Ross/110/62. Ross to Sir Alfred Lewis Jones, December 1911.

<sup>75</sup> See: R. Ross and J. G. Thomson, 'Experiments on the Treatment of Animals Infected with Trypanosomes, by Means of Atoxyl, Vaccines, Cold, X-Rays and Leucocyte Extract; Enumerative Methods Employed (Preliminary Note)' *J. Proceedings of the Royal Society of London. Series B, Containing Papers of a Biological Character (1905-1934)* 83(1911)563 pp.227–34.

<sup>76</sup> London, LSHTM. RC. Ross/113/20/06. Lever to Ross, 30 December 1911.

idealisation; despite providing the keys for prophylaxis against parasitic disease in the tropics, parasitologists did not work in isolation and could not guarantee the implementation of their findings. Research was hampered by financial restrictions and subject to administrative red tape.<sup>77</sup> Ross's own research was interrupted by his relocations with the Indian Medical Service, and lack of government support (both Indian and British).<sup>78</sup> His campaigns for better remuneration, recognition, and pensions for scientific workers (which included widely-read articles in the lay-press) resonated with the public and cultivated support: 'I have been very struck with your letter in "The Times" [...] I should be very pleased to add to such a fund (£500 anonymously)';<sup>79</sup> 'I have just read your letter in today's "Times", I wish I could send a cheque worthy of such an object'.<sup>80</sup> However the campaign was also met with resistance, as voiced in this article in the *Abolitionist* in 1914:

The claims of "research" workers to have benefitted mankind are matched only by their insistent pleading for grants and complaints of inadequate payment [...] I fail to see what claim [they have] upon the public purse of this country.<sup>81</sup>

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<sup>77</sup> 'It seems to me there is far too much red tape in these matters and that an ordinary layman like myself is in much greater danger of damaging the cause he wishes to help [...] if he rushes in where angels fear to tread.' London, LSHTM. RC. Ross/121/01. Lever to Ross, January 1912.

<sup>78</sup> See: London, LSHTM, RC. Ross/04/54/03. Prime Minister of Patiala State to Surgeon-Major Owen, medical advisor to the Maharaja of Patiala, 15 May 1895.

Also see: Ronald Ross, *Memoirs, with a full account of the great malaria problem and its solution* (London: John Murray, 1923)

<sup>79</sup> London, LSHTM. RC. Ross/119/27. A. F. Yarrow to Ross, 18 August 1913.

<sup>80</sup> London, LSHTM. RC. Ross/119/25. Lilian Glenny to Ross, 16 August 1913.

<sup>81</sup> 'Sir Ronald Ross and his Petition' *Abolitionist* 6(1914)15 pp.126-28. (p.126).

Such scepticism concerning the social value of parasitologists reinforced the need for their imaginative re-construction. The use of heroic discourses and underdog motifs in both private and public correspondence contributed to the dramatisation of the discipline—a dramatisation that served to glorify individuals and legitimise their fiscal demands. The *Northern Star* recognised this process when it stated that '[Ross's] conquest of malaria is one of the *romances* of scientific investigation,'<sup>82</sup> while the *Brisbane Courier* actively participated in this romantic construction, noting:

His fight against the malaria-carrying mosquito has been truly described as more romantic than any story of knight against huge dragon [...] this kindly knight was to show himself possessed of patience, imagination, determined and highly-developed reasoning power, and above all faith and courage.<sup>83</sup>

What started out as an imaginative narrative to frame their research became so invested in turn-of-the-century rhetoric pertaining to imperial epidemiology that the mythic 'knight of science' became an archetypal figure for representing the tropical scientific researcher. The multi-level impact of disease: biological, verbal, political, social, and cultural, which Charles Rosenberg discusses in *Framing Disease*, was carefully negotiated by parasitologists, who inflected their field in ways that would legitimise it in relation to public policy. In this way they cultivated a new professional

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<sup>82</sup> 'Sir Ronald Ross, Famous Scientist Ill' *Northern Star*, Friday 16 August 1929, p.3.

<sup>83</sup> 'Sir Ronald Ross' *Brisbane Courier*, Tuesday 20 September 1932, p.10.

identity, using the myths the British told themselves about nationhood to their own advantage. Indeed, *The Children's Newspaper* endowed Ross with an acutely nation-focused motive for his research. Reimagining his thought process leading up to the mosquito-malaria discovery, the editor wrote: 'ancient Greece and Rome were malarial hotbeds, and their imperial glories perished. Could they have perished, [Ross] wondered, from this enervating and consuming malaria? What if the British Empire should perish too?'<sup>84</sup> The reality was that Ross's motivations were more selfish than this, but the thought process presented here encapsulates the idealised version of the parasitology narrative. One of parasitology's most high profile discoveries, for the *Children's Newspaper's* editor Arthur Mee, was irrevocably connected to both Britain's imperial prowess and its historical models—a connection that compounds the sentiment expressed earlier in this chapter that parasitology was, for Britain, a secret weapon that differentiated it from the failed empires that it followed.

The discourses that surrounded the parasitologist at the fin de siècle placed emphasis on nationhood, glory, and solidarity; however, this was not always the reality. Fierce competition, professional disagreements, and political agendas complicated the lives of researchers, both demoralising and uplifting them: 'Nearly dead with work; but intend to live on a little longer!'<sup>85</sup> The patriotism that underscored much of British parasitology was often borne of a desire to out-do competing imperial nations, as reflected in Manson's encouragement to Ross, which was focused not on elucidating the

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<sup>84</sup> 'Men You Will Hear Of When You Grow Up' *The Children's Newspaper*, 6 December 1919, p.4.

<sup>85</sup> Ronald Ross, 'Letter 18 02/075' *The Beast in the Mosquito*, pp.51-53 (p.53).

problem, but elucidating it *first*:

It is evident the Italians are now on the scent. I do hope you will run into the quarry before them. Bignami is a clever little fellow and ambitious. Laveran is working up the Frenchmen. I do not hear that the Germans are moving, but they will and so will the Russians. Cut in first.'<sup>86</sup>

The realities of parasitic research were often tedious, unsavoury, and unethical, but this simply inspired a more tenacious public and professional attachment to the parasitology brand. The institutionalisation of the discipline in two major English cities, integral to politics and commercial trade, provided a public face and a platform from which to influence legislation and medical practice. Indeed, the London and Liverpool Schools combined scientific, medical, social, commercial, and political interests to produce two institutions that far surpassed Chamberlain's notion of a space for colonial medical training. The varying interests that contributed to their foundations so too shaped the professional identity of parasitologists and the ways in which they talked about their research. From Manson's emphasis on producing a fully funded and competent scientific discipline to compete with French and German medicine, to Alfred Lewis Jones's concern for British-African commercial trade, to Ross's more poetic desire to conquer 'million-murdering

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<sup>86</sup> Patrick Manson, 'Letter 48 02/018' *The Beast in the Mosquito*, pp.124-25. (p.125).

death',<sup>87</sup> proponents of parasitology moulded the discipline to suit their professional interests under the versatile banner of national identity.

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<sup>87</sup> From his famous malaria day poem 'Reply'. Ronald Ross, 'Reply' (1897) *Philosophies* (London: John Murray, 1911) pp.53-54. (p.54).

## Geographical Pathology, Pathological Geography: Parasitic Disease in Adventure Romance and Detective Fiction.

A disease so deadly that the survivor is thought to be a fraud,<sup>1</sup> a cover story for cold-blooded murder,<sup>2</sup> retribution for the crimes of a slave-owner,<sup>3</sup> the diagnosis that absolves an innocent man,<sup>4</sup> a murder weapon capable of driving its wielder mad—<sup>5</sup> these represent just some of the plot-lines published at the turn of the century that employed the use of parasitic disease. Ranging from 1894 to 1934, all of the examples above involve the disease of human African trypanosomiasis, also known as sleeping sickness. As its name suggests, sleeping sickness is characterised by severe sleep disturbance. The initial symptoms include fever, headache, sore joints, and itching. Once the disease has reached its second stage, crossing the blood-brain barrier, neurological symptoms such as sensory disturbances, insomnia, severe fatigue, confusion, and loss of motor coordination manifest.<sup>6</sup> The causative agent, a protozoan parasite of the species *Trypanosoma*, releases a compound called tryptophol, known to induce sleep, which leads to

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<sup>1</sup> Joseph Hocking, *The Dust of Life* (London: Cassell, 1915).

<sup>2</sup> R. Austin Freeman, *The Mystery of 31 New Inn* (1912; Charleston: Bibliobazaar, 2006).

<sup>3</sup> Henry Seton Merriman, *With Edged Tools* (London: John Murray, 1894).

<sup>4</sup> L. T. Meade and Clifford Halifax, 'The Adventures of a Man of Science, IV - The Sleeping Sickness' *The Strand Magazine* 12(1896) p.401-14.

<sup>5</sup> H. P. Lovecraft, 'Winged Death' *Weird Tales* 23(1934)3, pp.299-315, reproduced online: 'Winged Death' *The H. P. Lovecraft Archive* (2009)

<<http://www.hplovecraft.com/writings/texts/fiction/wd.aspx>> [accessed 21 March 2016].

<sup>6</sup> 'Trypanosomiasis, human African (sleeping sickness)' *World Health Organisation* (Geneva: World Health Organisation, 2016) <<http://www.who.int/mediacentre/factsheets/fs259/en/>> [accessed 21 March 2016].

increasing somnolence, coma and, if left untreated, death.<sup>7</sup> The conspicuousness of these late-stage symptoms endows the disease with imaginative potential—a deadly sleep becoming synonymous with this often-fatal African disease. Its suitability for furnishing plot lines is reflected in its inclusion in two key genres at the turn of the century: adventure romance and detective fiction. I argue that the literary significance of this disease, and parasitic diseases in general, stems from its unique relationship to geographical environment. Parasitic diseases, unlike many bacterial ones, are not directly contagious, relying on complex lifecycles that often involve extracorporeal stages, intermediate hosts, and vector transmission. The specific microclimates, floras, and faunas of the tropics directly support the proliferation of parasites and their vectors and thus are integral to the successful transmission of these diseases.

Protozoan parasites, like those of malaria and sleeping sickness, are microscopic single-celled organisms that infect red blood cells and are undetectable to the naked eye; carried incognito in their mosquito and tsetse fly vectors, these pathogenic organisms are difficult to depict in literature, but nonetheless produce pathologies with huge dramatic potential. Thus in fiction, I argue, they come to be represented by aetiological and environmental signifiers: the cyclic fever of malaria, the delirious coma of sleeping sickness, and the hot, marshy breeding grounds of the mosquito and tsetse fly vectors. These significations foregrounded the relationship between parasitic diseases and tropical geography—a connection that was used to express anxiety about the colonial encounter. The distinct geographical and colonial associations of these

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<sup>7</sup> Jules J. Berman, *Taxonomic Guide to Infectious Diseases: Understanding the Biological Classes of Pathogenic Organisms* (London: Elsevier, 2012) pp.97-98.



diseases performed important functions in literary texts, framing them within the context of institutional, political, and medical discourses concerning the relationship between Britain and her colonies. In this chapter I will explore the dialogue between contemporaneous research in parasitology and parasitic disease as represented in British fiction, arguing that literary authors consciously engaged with parasitology as a field. This is reflected in the importation of disciplinary politics into their plot lines along with disciplinary science. The power of parasitic disease as a plot device is paramount at the turn of the century; taking cues from the parasitology brand, literary authors recognised that these diseases carried distinct cultural associations that might be moulded to fit narratives of British nationhood

Through British fiction we might trace developments in parasitological thought, particularly in relation to sleeping sickness. From the racial profiling of *With Edged Tools* (1894) and the filarial connections of 'The Adventures of a Man of Science' (1896), to the tsetse fly vectors of *Multitude and Solitude* (1909) and *The Dust of Life* (1915). As the sleeping sickness epidemics of the 1890s and 1900s gained prominence in the news, the scientific work being carried out by the proponents of the London and Liverpool Schools in conjunction with sleeping sickness was too being highlighted. Physicians battled it out in the medical press: sleeping sickness was said to be due to malnutrition, to toxic contamination, to germs from the soil or water, due to infestations with ankylostomiasis or *Filaria perstans*, malarial poisoning, or a form of cerebrospinal meningitis. The failure to identify its cause meant that targeted research into finding a cure was impossible, and most accounts of the disease before 1900 list it as fatal and having no known

cure (a reality upheld in *With Edged Tools* [1894]) and 'The Adventures of a Man of Science' [1896]). This fitted the disease for imaginative exploration, with authors providing their own cures.

The changing scientific understanding of disease transmission in the tropics, orchestrated by the pioneers of tropical medicine in the 1890s, modified the medical and lay understanding of the tropical landscape from an intrinsically pathological space, to one populated by parasites and vectors. We have seen this at work with Patrick Manson's and Luigi Sambon's mythological metaphors in chapter two, which attempted to dispel the climatic understanding of disease. The shift in emphasis from key immovable components of the colonies: tropical sunshine, mist, and marshland, to definable, and thus preventable causes of disease: insect bites, contaminated water, and undercooked meat, stripped the tropics of their mystery, and facilitated, for the first time, a vision of a commercially viable and healthy British Empire. As one correspondent for the *British Medical Journal* wrote in 1898:

If climate pure and simple be the cause of unhealthiness in the tropics, the position is hopeless; we cannot materially modify climate. But [...] it is the parasites of malaria, of dysentery, and of typhoid that make the tropics so unhealthy to Europeans [...] take away the malaria microbe and the dysentery microbe from West Africa and this deadly country would become as healthy as Europe.<sup>8</sup>

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<sup>8</sup> 'Medicine in the Tropics', p.910.

Despite these discoveries and the transformative rhetoric that accompanied parasitologists and their research, the colonial landscape retained much of the superstition that it originally garnered in the popular imagination. This is in part due to the 'grip on the public mind' that the telluric theory of malaria exerted, which Ronald Ross lamented was not likely to disappear for many years: 'people will long dread the harmless smell of turned earth, or point with fear to the innocent evening mist, or close their windows against the cool evening breeze.'<sup>9</sup> The identification of parasites as the causative agents of tropical disease, rather than climate or miasma, endowed tropical disease with the ability to travel beyond the boundaries of the tropical in the bodies of Englishmen—who, having left the tropics, might still be pathologically affected by the region. Michael Worboys argues that there was a shift in understanding from environment to people as the main sources of infection in the late-nineteenth century with reference to bacteriology.<sup>10</sup> However, I argue that, despite this recognition of the role of human carriers in disease transmission, for the general public, parasitic diseases imaginatively retained their geographical stigma. This was undoubtedly the result of the combined effect of the persistence of telluric theories and of the recognition of the unique reliance of parasites on arthropod vectors and specific environments, which ensured that such diseases remained conceptually linked to the tropical environment. In *Exploring Victorian Travel Literature: Disease, Race and Climate* (2014), Jessica Howell analyses the politicised and racialised discourse of 'climatism', arguing that writers in the mid-to-late nineteenth

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<sup>9</sup> Ronald Ross, *Malarial Fever, its Cause, Prevention and Treatment, Containing Full Details for the Use of Travellers, Sportsmen, Soldiers, and Residents in Malarious Places* 9<sup>th</sup> edn. (Liverpool: Liverpool University Press, 1902) n.p.

<sup>10</sup> Michael Worboys, *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865-1900*, (Cambridge: Cambridge University Press, 2000) p.234.

century used climate in 'multivalent and sometimes conflicting ways, to encourage or discourage imperial expansion' and 'to emphasize or undercut a sense of their own heroism.'<sup>11</sup> She argues that climatic discourse offered writers 'unique rhetorical opportunities,'<sup>12</sup> owing to the flexibility of its tropes and the ambiguity of its mechanism. The utility of these rhetorical opportunities was also identified by literary authors, who sought to fuse both environmental and parasitic understandings of disease transmission in the tropics to produce narratives that engaged with imperial politics.

In fiction, those infested with parasitic diseases were marked by their current or past association with a tropical region, thus the tropics, in a sense, travelled *with* the causative agent of parasitic disease to lend credence to the idea that you can take the man out of the tropics, but not the tropics out of the man. This literary nuance foregrounds the importance of bionomics, a field that many researchers recognised as being intrinsic to understanding tropical pathology. Ray Lankester writing to Ross in 1899 noted in relation to the malaria parasite, 'I am glad you will use the word "bionomics"—you apply it quite correctly. It refers to the animal or plant as a "going concern"—its relations to others of its kind and to the world around it.'<sup>13</sup> This holistic understanding of the parasite advocated a complex, empirical view of the pathological agent and at the same time re-situated it in the multiplex context of its natural environment, thus both abstracting it from this environment and cementing its associations. In this way the cartographic and climatic associations of tropical disease were retained in

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<sup>11</sup> Jessica Howell, *Exploring Victorian Travel Literature: Disease, Race and Climate* (Edinburgh: Edinburgh University Press, 2014) p.5.

<sup>12</sup> Howell, *Exploring Victorian Travel Literature*, p.14.

<sup>13</sup> London, LSHTM. RC. Ross/145/07/01-30. E Ray Lankester to Ross, 14 December 1899.

modified guise, the tropical landscape remaining, certainly for the literary author, a potent symbol for pathology.

The miasmatism of the early nineteenth century, which did much to stigmatise tropical spaces, was still alive in fiction at the century's end, despite the widespread acceptance of germ and vector-based theories of pathogenesis. Indeed, the advent of germ theory did not wholly oppose miasmatic understandings of disease transmission. Ross argued that Manson's belief in the mid-1890s that spores in the water or air might spread malaria, demonstrated that he was 'still under the influence of the miasmatic theory'.<sup>14</sup> Thus it would be over-simplistic to read miasmatic and vector-based references to disease in fiction as in medical opposition. In this chapter, I will analyse a variety of texts that navigate the fraught relationship between colonial disease and colonial environment. I read in these texts an anxiety concerning tropical encounters that articulates an apprehension about the natural world, offset by explorations of personal and national selfhood. These diseases, with their tropical associations and colonial politics, were springboards for considering the place of Britain and Britons in an increasingly global world. Together with the narratives of parasitologists, these texts formed a dialogue that constructed, explored, and problematised the British imperial project.

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<sup>14</sup> Ronald Ross, *Memories of Sir Patrick Manson* (London: [privately printed], 1930) p.39.

Henry Seton Merriman's 1894 novel *With Edged Tools*, which the *Indian Medical Gazette* endorsed as providing a depiction of sleeping sickness, describes the disease as 'a deadly sleep from which [you] never w[a]ke'.<sup>15</sup> The subsequent encounter with it—made all the more sensational by antagonist, Victor Durnovo's, recently mutilated face—is short and dramatic:

Oscard took him by the arms, and held him in a sitting position. Durnovo's fingers were clutching at his sleeve. "Shake me! God! Shake me!" Then Oscard took him in his strong arms, and set him on his feet. He shook him gently at first, but as the dread somnolence crept on he shook harder, until the mutilated inhuman head rolled on the shoulders. [...] And so Victor Durnovo died. His stained soul left his body in Guy Oscard's hands, and the big Englishman shook the corpse, trying to awake it from a sleep, which knows no earthly waking (284-85).

Durnovo's death is presented as a punishment for his crimes against humanity: keeping African slaves under the guise of fair employment. When he is eventually caught out, the European man-servant Joseph comments: "'I wonder God lets yer stand there. I can only think that He doesn't want to dirty His hand by striking yer down!'" (246). British explorer Guy Oscard and his manservant Joseph wash their hands of the business they have with Durnovo (the cultivation of a secret African wonder-drug, Simiacine) and inform the slaves that they are free. When given the choice, however, the slaves elect to stay with Durnovo, a decision that strikes

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<sup>15</sup> Merriman, *With Edged Tools*, p.284.

Patrick Brantlinger as Merriman 'impl[ing] that Africans are not suited to freedom'.<sup>16</sup> However, their apparent allegiance to the slave-owner is a calculated move in order to enact their revenge: the mutilation of Durnovo's face: '[they cut his] eyelids away, leaving the round balls staring, blood-streaked; cut away his lips, leaving the grinning teeth and red gums; shear[ed] off his ears' (282). He subsequently catches sleeping sickness, an event that appears to be attributable to divine retribution:

So, after all, Heaven stepped in and laid its softening hand on the judgement of men. But there was a strange irony in the mode of death. It was strange that this man, who never could have closed his eyes again, should have been stricken down by the sleeping sickness (285).

Whether God had stepped in to end Durnovo's life subsequent to his mutilation—perhaps in response to Joseph's frenzied pleas: "'O God in Heaven - Kill it! Kill it!'" (282)—or whether the sleeping sickness itself was divine retribution for the crimes of a man who had lived 'in dread' of the disease, is unclear. However, its subsequent killing of hundreds of people and Durnovo's apparent agency in the slaughter: '[his face] had a strange mystic grin [...] he had won the last throw [...] he had left the sleeping sickness behind him' (285-86), is troubling. The sleeping sickness here represents both an ironic punishment for Durnovo and his lethal revenge on the slaves who maimed him. The associations of the disease with slavery in Merriman's novel gesture toward sleeping sickness's historical

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<sup>16</sup> Patrick Brantlinger, 'Victorians and Africans: The Genealogy of the Myth of the Dark Continent' *Critical Inquiry* 12(1985)1 pp. 166-203 (p.181).

importation by the slave trade<sup>17</sup> and reinforce the image of the disease as characterised by its alias 'Negro Lethargy', so called owing to the belief that it only affected black people. However, its first victim in the narrative—Durnovo, a West Indian—appears to acknowledge the contemporaneous reports of sleeping sickness in mixed race, as well as black subjects. An 1898 article in the *Sheffield Evening Telegraph* drew attention to its racial profiling, noting that the appellation 'negro lethargy' was a result of it being 'practically confined to negroes'. The article insisted that no 'authentic cases' had occurred in 'pure-bred white men', but conceded that the disease had been reported in 'Moors and half-breeds'.<sup>18</sup> However, a review for *With Edged Tools* in the *London Standard* suggested that Merriman saw the disease as affecting all races equally:

The medical faculty knows very little about the "sleeping sickness" of Africa, regarding it as a sporadic affection peculiar to negroes; but Mr Merriman has discovered that it is a deadly and highly contagious epidemic, capable of sweeping off great companies of people at a blow, and as dangerous to white men as to black.<sup>19</sup>

This comment is noteworthy, not least because it is partially inaccurate, representing the reviewer's misreading of the literary text.<sup>20</sup> Although Merriman might have been justified in demonstrating the dangers of the disease to white

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<sup>17</sup> See: Ray Lankester, 'Art. VI.-The Sleeping Sickness' *Quarterly Review* 200(1904)339 pp.113-38.

<sup>18</sup> 'Sleeping Sickness' *Sheffield Evening Telegraph*, Saturday 3 December 1898, p.3.

<sup>19</sup> 'Five New Novels' *London Standard*, Tuesday 28 August 1894, p.2.

<sup>20</sup> Although Durnovo might arguably fall into the category of white men, his West Indian characterisation in the novel works to separate him from them: "It's good enough for black-scum and chocolate-birds like Durnovo, but this country's not built for honest White men" (p.239); "Given a mixed blood - evil black with evil white and what can the result be but evil?" (p.293).



men (explorer Richard Burton had reported cases of sleeping sickness in Europeans referenced in an article in the *British Medical Journal* in 1875)<sup>21</sup> Merriman does not offer us a white victim, nor does he endow his European travellers with fear of the disease. The European protagonists' lack of anxiety concerning the disease when faced with it—Guy Osgard sees 'a whole village devastated by it' (284) and still elects to hold the dying Victor Durnovo, a man he despises, in his arms—suggests that they do not think themselves vulnerable.

Merriman includes a conversation about the virulence of the disease: "'When it first shows itself, infectious is not the word. It is nothing but a plague'" (316); however, he does not directly address the vulnerability of the speakers, who, though discussing its infectiousness, appear to be detached from it, remarking 'not one of those fellows could have escaped it'—'*those* fellows' implicitly referring to both the geographical location of the victims and their ethnicity (316). We might interpret the line 'when it first shows itself' as a suggestion that Osgard and Meredith, the European speakers, have simply missed the infective period of the disease, Durnovo not recognising his symptoms as he journeyed from the Simiacine plateau to Msala, and only succumbing to them once in Osgard's presence. However, Osgard identifies the Simiacine plateau as the locus of the outbreak, a place he and Joseph have lately come from.

Still, the reviewer might be excused for mistaking European protagonist Jack Meredith's illness for sleeping sickness because, despite being diagnosed with malaria, he exhibits some of the major symptoms of the former disease,

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<sup>21</sup> See: Albert A. Gore, 'The Sleeping Sickness of Western Africa' *British Medical Journal* 1(1875)731 pp.5-7.

including 'a constant, never-ceasing fatigue' (196). Perhaps more conspicuous is the complete absence of the cyclic fevers, anaemia, and enlargement of spleen so characteristic of malaria. Indeed, the doctor, despite being 'wise in the strange maladies of the West Coast' (205), does not offer the popular treatment: quinine, but appears to prescribe nothing but rest, beef-tea, and the presence of a woman, the mere virtue of which, Merriman tells us, has an ameliorating effect. In truth, the ambiguity of representation is most likely due to the confluence of symptoms between the major diseases of the tropics: fever and headache, for example, are common to malaria, sleeping sickness, kala-azar (visceral leishmaniasis), and most helminthiases; anaemia is common to malaria and ankylostomiasis (hook worm disease); and spleen enlargement is common to malaria and kala-azar.<sup>22</sup> These confluences led to the production of a generalised tropical pathology, which has been analysed elsewhere in relation to Joseph Conrad's imperial fiction.<sup>23</sup>

Robert McGill, for example, explores the impact that the germ theory of disease had on Conrad's writing. McGill argues that the symbolism of disease and contamination pervades Conrad's fiction and even resonates in textual formations: 'Conrad's fictions participate in a vicious circle of representation: they appropriate the literal disease of the colonial experience as metaphor, and the audience in turn reads these tropes as themselves contaminating.'<sup>24</sup> The metaphor of disease is here used to articulate the biological, psychological, and social dangers of colonial contact generally. Tropical disease is depicted as general

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<sup>22</sup> See Glossary of Terms for definitions.

<sup>23</sup> I discuss Conrad here because his imperial fiction invokes similar frameworks to the texts I discuss in this thesis and has attracted a lot of critical attention owing to his canonical status.

<sup>24</sup> Robert McGill, "'The Germs of Empires': Decivilisation and Conrad's Discontent' *The Conradian* 27(2002)1 pp.51-64. (p.59).

weakness and ill health, and connected to colonial spaces. Jessica Howell argues that 'the omnipresence of thick and stifling mist in *Heart of Darkness* is not only a stylistic strategy, but also indicative of the characters' perceptions of climatic danger.'<sup>25</sup> The climatic associations of tropical disease in Conrad's fiction reflect an 'uncertainty regarding disease causation' (230), and inspire characters to 'become more watchful of their interior state of health' (224). Africa's miasmatic mist poses a very real and omnipresent threat to bodily and psychological integrity in Conrad's fiction, which articulates European fears concerning the deleterious effects of the African environment. This again generalises the threat of tropical disease; its connection to inescapable climatic factors, rather than specific locations, media, or vectors, frames the tropics in ways that lend themselves to this trope of generalised tropical pathology. In *Heart of Darkness* (1899) and 'An Outpost for Progress' (1897), the natives and colonisers alike are presented as fatigued and full of 'fever'. In 'An Outpost for Progress' Chief of Loanda trading station, Kayerts, and his assistant, Carlier, are said to 'now and then' be plagued by 'fever';<sup>26</sup> fever is implicated in the death of the last chief, and used as a cover for the murder of Carlier by Kayerts: 'Makola said softly, pointing to the dead man who lay there with his right eye blown out "He died of fever."<sup>27</sup>

This euphemistic treatment of fever has parallels with Merriman's appropriation of sleeping sickness. The disease in *With Edged Tools* is sensationalised by the fate of its chief victim. Durnovo's graphically mutilated

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<sup>25</sup> Jessica Howell, "'Self Rather Seedy': Climate and Colonial Pathology in Conrad's African Fiction' *Literature and Medicine* 27(2008)2 pp.223-247.(p.224).

<sup>26</sup> Joseph Conrad, 'An Outpost of Progress' *Heart of Darkness and Other Tales* ed. Cedric Watts (1897; Oxford: Oxford University Press, 2008) pp.1-26. (p.10).

<sup>27</sup> Conrad, 'An Outpost of Progress' p.23. NB. in the serial the line reads: 'with half his face blown off'.

face becomes an image associated with both his moral degeneracy and his epidemiological 'revenge' when he spreads the disease along the coast. Merriman's two diseases (sleeping sickness and malaria) work to establish the pathologies of the tropics as representative of moral degeneracy and of the insidiousness of the tropic environment, which itself is inseparable from its diseases. The inadequacy of the distinction between the landscape and its diseases further compounds the generalised pathological quality of the tropics, which contains nuanced versions of a standardised and symbolic deadly fever. Likewise, in *Heart of Darkness*, Conrad presents the natives in terms of general ill-health, they are 'black shadows of disease' and weary 'phantoms'.<sup>28</sup> Marlowe's conversations with the accountant are held against the backdrop of a sick agent, variously groaning and 'too ill to groan' (120), and the station manager admits that almost every agent in the station had been laid low by 'various tropical diseases' (123). The context of ill-health that underscores such narratives compounds the framing of Africa as generally pathological, in turn implicating this pathological quality in the social and political goings-on of empire, serving as explanations for personal indiscretion, and as vindication for imperial intervention. However, as I will demonstrate in this chapter, authors like Henry Seton Merriman, John Masefield, and Joseph Hocking, engaged with the aesthetics of both environmental and parasitic transmission routes in order to provide more nuanced and politically engaged depictions of the colonial encounter.

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<sup>28</sup> Joseph Conrad, 'Heart of Darkness' *Heart of Darkness and Other Tales* ed. Cedric Watts (1897; Oxford: Oxford University Press, 2008) pp.101-87. (p.118).

## **"A curse seems to brood in the atmosphere": Changing Representations of Disease Aetiology and Transmission in the Tropics.**

In the introduction to his medical textbook, *Geographical Pathology*, (a book that Patrick Manson would reference in the inaugural lecture to the Royal Society of Tropical Medicine and Hygiene in 1907 to demonstrate how rapidly the discipline had advanced),<sup>29</sup> Andrew Davidson wrote of three types of infective disease: miasmatic, miasmatic-contagious, and climatic. He attributed malaria to miasmatic and cholera to miasmatic-contagious, and stated that some diseases, like Typhoid, might take on a miasmatic *or* miasmatic-contagious form. His use of miasmatic to mean a pathogen 'developing in, and derived from, the soil and other local surroundings of man,'<sup>30</sup> enabled him to label Italy, Algeria, India, Africa, and the United States as 'malarious countries' (x). Disease, according to Davidson, was a threat from without, and its vehicles were environment, climate, and population. This epidemiological model supported an understanding of tropical diseases as caused by 'tropical' environments—thus climate and populations offered, as the title of his book suggests, a classificatory framework mediated by geography. Malaria, the only truly parasitic disease (cholera and typhoid are bacterial), was attributed solely to miasma and so connected more thoroughly to the environment. While Davidson's book attempted to bring to light the specific climatic and environmental conditions that support the imposition of disease generally, he stigmatised tropical landscapes by asking questions like 'Is the

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<sup>29</sup> Gordon. C. Cook, *Tropical Medicine: An Illustrated History of the Pioneers* (London: Elsevier, 2007) p.62.

<sup>30</sup> Andrew Davidson, *Geographical Pathology: An Inquiry into the Geographical Distribution of Infective and Climatic Diseases* (Edinburgh & London: Young J. Pentland, 1892) p.viii

disease [enteric fever], as seen in India, identical with the enteric fever of Europe?' (399). He concluded that causes of disease in India are 'more commonly diffused, or more intense', additionally implicating the climate in the weakening of the European constitution. These conclusions constructed narratives of European and colonial difference.

The acclimatisation debates of the 1890s pitted climate against microbial action, with men like Sambon and Manson arguing in favour of microorganisms as the causative agents of disease. Louis Pasteur's germ theory in the 1860s, Manson's discovery of the mosquito vector for filariasis in 1877, and the discovery of the micro-organisms responsible for tuberculosis, cholera, and malaria in the 1880s, provided the foundation for a new way of looking at the colonial environment. However, the invisibility of these causative agents to the naked eye meant that attention was refracted back onto the attributes associated with their propagation—moisture, marshland, and 'tropical' flora and fauna. This partially accounts for the persistence of apparently environmental depictions of disease in fiction. Indeed, Rod Edmond argues that the new germ and vector-based tropical medicine emergent at the end of the nineteenth century, while rejecting the flawed notions of medical cartography, redefined the relationship between disease and environment in ways that retained the tropical-temperate divide.<sup>31</sup> This is apparent in Davidson's treatment of tropical disease, as well as Manson's careful outlining of diseases of warm climates, which he argued are mostly confined to those regions owing to their reliance on intermediate hosts or

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<sup>31</sup> Rod Edmond, 'Returning Fears: Tropical Disease and the Metropolis' *Tropical Visions in an Age of Empire* eds Felix Driver and Luciana Martins (Chicago: University of Chicago Press, 2005) pp.175-94. (p.181).

environmental conditions specific to tropical spaces. Thus even discussions of disease inflected by germ theory were ostensibly framed by geography.

Merriman's *With Edged Tools* includes support for both miasmatic and germ-based theories of transmission and places them in dialogue with the environment by depicting disease as originating from the landscape at large:

From the mysterious forest-land there creeps down a subtle, tainted air that poisons the white man's blood, and either strikes him down in a fever, or terrifies him by strange unknown symptoms and sudden disfiguring disease (66).

A link between geographical space and pathology is clearly made here. Despite the fact that the causative parasitic agent for malaria had been discovered by Charles Laveran in 1880, the transmission pathway would not be fully elucidated for a further eighteen years.<sup>32</sup> Thus in the 1880s and 1890s, theories of transmission included transmission by air, by soil, by water, and by mosquito. These heterogeneous theories of disease causation are reminiscent of what Bruno LaTour recognises as a problem with the pre-pasteur hygienist view of disease, namely an excess of theories that worked to exempt any definite positions: 'Since anything might cause illness, it was necessary to act on everything at once, but to act everywhere is to act nowhere.'<sup>33</sup> The co-existence of competing theories of transmission is reflected in the generalised pathological

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<sup>32</sup> Francis. E. G. Cox, 'History of the Discovery of the Malaria Parasites and their Vectors' *Parasites and Vectors* 3(2010)5 pp.1-9.

<sup>33</sup> Bruno LaTour, *The Pasteurisation of France*, trans. Alan Sheridan and John Law (Harvard: Harvard University Press, 1988) pp.20-21.

quality of the tropics in fiction, which, by alluding to more than one transmission pathway, painted the tropical landscape as the embodiment of danger.

The ill-defined dangers of the colonial encounter extend beyond the physical to encompass, for some writers, the moral and the psychological. In his contribution to *Hygiene and Diseases of Warm Climates* (1893), edited by Davidson, Edward Birch insisted that: 'though with care a European child may be reared in India up to 5 or 6 years, beyond those ages a physical and moral degeneration occurs.'<sup>34</sup> In *With Edged Tools* this connection between physical and moral deterioration is upheld by Merriman's 'irritability' metaphor, which comes to represent immorality and illness in a combination unique to its geography: 'there are moral microbes in the atmosphere of different countries, and we must not judge one land by the laws of another. There is the fatalism of India, the restlessness of New York, the fear of the Arctic, the irritability of Africa' (46). The irritability of Africa is engendered by Africa's specific brand of 'moral microbes'—a reference to both the perceived degenerative effects of the tropical world on the civilised: 'it makes honourable European gentlemen commit crimes of which they blush to think in after days' (37), and to the germ theory of disease. The old association between morality and illness, discussed in Chapter One, is in Merriman's novel writ large, where the reckless and immoral passions of the wilderness are 'inhaled into the white man's lungs with the air of equatorial Africa' (37). According to Merriman's novel, the very atmosphere of Africa has the power to degenerate the civilised; 'it is everywhere' – in the forests, in the rivers, 'lurk[ing]' (37).

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<sup>34</sup> Edward Birch, 'The Influence of Warm Climates on the Constitution' *Hygiene and Diseases of Warm Climates* ed. Andrew Davidson (Edinburgh & London: Young J. Pentland, 1893) pp.1-24. (p.4).



This irritability, although seemingly produced by the African atmosphere, is framed using the signifiers of germ theory. The intangible degenerative effects of Africa are discussed in terms of 'microbes' and treated medicinally by Victor Durnovo, with an unnamed liquid in half a glass of water.<sup>35</sup> Durnovo is described from the outset as afflicted with disease; he is half-starved and restless, on the verge of jaundice, his eyes 'bilious, fever-shot, unhealthy', and his face 'disease-stricken' (40). However, it is with the generalised pathology of Africa that he is afflicted, 'the irritability of Africa was upon him—had hold of him—gripped him remorselessly' (37). Thus 'irritability' becomes a euphemistic term for tropical experience, a conflation of a kind of moral hysteric: 'men quarrel about trifles and descend into brutal passion' (38), and of tropical disease: 'he was treating himself scientifically for the irritability to which he had given way' (39). This conflation suggests both that immoral behaviour is generated by the landscape and that the prevalence of immorality might be associated with the imposition of disease. Tropical disease here is ultimately responsible for Birch's 'physical and moral degeneration'.<sup>36</sup> Indeed, Durnovo's immoral proposition to Meredith, which underpins the narrative, is framed by the perhaps extenuating fact that Durnovo is 'full of quinine and fever, in deadly earnest' (48), suggesting a direct connection between immorality and disease in tropical spaces.

The narrator expands on Africa's irritability, explaining: 'no one knows what it is, but it is there, and sometimes it is responsible for murder' (37). This might refer to Durnovo's shooting of slaves, or to Africa's 'murder' of Durnovo (by infection with sleeping sickness). The pathologisation of tropical spaces

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<sup>35</sup> Given Merriman's later characterisation of Durnovo, this is probably quinine.

<sup>36</sup> Birch, p.4.

encapsulates the developing understanding of the colonies as home to unparalleled disease in the wake of the institutionalisation of Parasitology and Tropical Medicine. The inauguration of these specialised institutions generated renewed focus on tropical diseases and, through disciplinary rhetoric, offered disease as the chief lens through which to view the colonial encounter. The symbolic conflation of the tropical colonies and their primary diseases is reflected in Ronald Ross's assertion, on leaving the Indian Medical Service, that he would 'bring the tropics to Liverpool!'<sup>37</sup> By this he meant bring the diseases of the tropics to Liverpool, referring specifically to the animal parasites at the Thomson-Yates laboratories. The statement, in a letter to fellow parasitologist George Nuttall in 1899, is a clear example of 'the tropics' coming to be defined chiefly by their pathologies. Merriman propounds this synonymic understanding of the colonies when he writes that, upon recovering from his illness British adventurer Jack Meredith is afraid, not of disease specifically, but of 'Africa' (339) in general. Although Jack Meredith at no point exhibits questionable behaviour or moral deterioration, the narrator insists that the 'irritability of Africa had laid its hand upon him as soon as he had set his foot upon its shore' (339). The fact that he doesn't exhibit behavioural changes, but does contract a debilitating illness, compounds the notion that this 'irritability' is a euphemism for tropical pathology.

John Masefield's 1909 novel, *Multitude and Solitude*, describes a similar tropical phenomenon. The novel follows London playwright, Roger Naldrett, who, after losing the love of his life in a tragic accident, resolves to contribute positively to society. To this end, he accompanies physician Lionel Heseltine to Africa to

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<sup>37</sup> London, LSHTM. RC. Ross/17/05/113. Ross to George Nuttall, April 16 1899.

search for a cure for sleeping sickness. The power of the tropics to wear down the body's defences against ill health and to weaken the constitution is a frequently invoked motif in Masefield's novel. Like in Merriman's novel, Masefield, through the mouthpiece of Lionel, notes the phenomenon of irritability in the tropics and connects it to illness—to 'sleepless nights [...] fever [...] over-exertion'. The irritability of visitors to the tropics is derived, he argues, 'from physical weakness of some kind, rather than from any weakness of character'.<sup>38</sup> However, he admits that the two are bound by 'close and subtle' links, uncovering an anxiety about the ability of the tropics to expose underlying moral weaknesses in European travellers. Indeed, what we might consider as the moral weaknesses of Masefield's protagonists: selfishness, ill-temper, and paranoia, are framed by ill-health. The portion of the novel set in Africa, opens: 'Ten months later Roger sat swathed in blankets, under mosquito netting, steering a boat upstream. He was in the cold fit of a fever' (175). Thus the colonial encounter is framed from the outset by disease. Dysentery, malaria, and sleeping sickness mar the voyage, and our access to the African landscape and its inhabitants is mediated by Roger's hallucination-ridden narrative viewpoint. This further ties Africa and disease together by offering us only this lens through which to view the colonial encounter. The behaviours of European and African people are inseparable from their tropical illnesses and so the coded 'irritability' of the tropics becomes a signifier of not just physiological, but also moral, contamination.

This moral contamination is reflected in Masefield's characterisation of the landscape, which threatens the integrity of Roger's identity by refusing to respect

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<sup>38</sup> John Masefield, *Multitude and Solitude*. (London: Grant Richards, 1909) p.256.

somatic boundaries. When he observes the 'savageness' of the mud as it 'beslimed' the camp, and all within it, 'he felt that it had been worked, not only into his skin, but into his nature' (207). The infiltration of his personal nature by the Nature of the tropics raises questions about the long-term effects of exposure to the tropical environment. Roger admits that 'he had never before known what it is to be really dirty' and worries for the impact of this on his character (207), a sanitation anxiety that echoes Edward Birch's comments on the impact of the tropical environment on moral and physical constitution. Tropical nature holds significance for Masefield as a phenomenon that embodies a number of social and somatic dangers, framed ostensibly by its associations with pathology. The apparent barbarism of the landscape is framed by, and indicative of, tropical disease.

When Lionel falls ill with sleeping sickness, Roger describes his symptoms in detail: 'high temperature, a rapid pulse, the glands of the neck swollen, a rash on the chest, hands or shoulders, a flushed face, and feeble movements' (224). This is contrasted with Roger's initial illness, which is simply described as 'fever'. Unlike Lionel's, Roger's illness is characterised as part and parcel of colonial travel. Lionel warns him before embarking on the trip that it 'is one thing [he] will have to get used to—fever. You get used to doing your work with a temperature of one hundred and two degrees' (147). He attributes this fever to 'any start, or shock, or extra work', suggesting that the tropical sphere weakens the constitution, predisposing individuals to stress-induced ill health. By distinguishing between these two types of illness—a specific tropical disease, versus an unspecified ever-present fever—Masefield's novel highlights the utility of the generalised tropical

pathology trope in expressing the imaginative connection between moral and physical weakness. Roger's fever is a reaction to the tropical environment, representative of his succumbing to its corrupting influence. Texts like Conrad's *Heart of Darkness* (1899) and H. Rider Haggard's *King Solomon's Mines* (1885) also rely on this narrative trope, packaged as an unspecified fever: 'I had an attack of fever, and was in a bad way generally'.<sup>39</sup>

The vagueness of such descriptions plays on the pre-eminence of fever as a disease symptom, in addition to contributing to the belief that the tropics were obstructive to one's general health. When Jack Meredith contracts malaria in *With Edged Tools* he is said to be suffering from a 'thorough break down in health' (195). Malaria, which Manson dubbed 'that blessed cloak for ignorance',<sup>40</sup> here stands in for the quintessential tropical disease—quintessential because it is used, as Manson noted, to explain almost every disease occurring in the tropics, and because it becomes, as Rohan Deb Roy argues, a catch-all term to account for a 'diverse range of expressions of physical unease'.<sup>41</sup> Deb Roy, in his article 'Mal-Area of Health: Dispersed History of Diagnostic Category', discusses the diagnostic illusiveness of malaria in the nineteenth century, arguing that the uncertainty surrounding the 'ontological characteristics' of malaria led to its shrouding in mystery and to the multi-potent adoption of malaria as a kind of 'diagnostic jargon' or biomedical metaphor (122-29). This perhaps explains Merriman's ambiguous handling of Jack Meredith's illness in *With Edged Tools*,

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<sup>39</sup> H. Rider Haggard, *King Solomon's Mines* ed. Dennis Butts (1885; Oxford: Oxford University Press, 2008) p.18.

<sup>40</sup> Patrick Manson, 'A Clinical Lecture on the Sleeping Sickness' *British Medical Journal* 2(1898)2979 pp.1672-77. (p.1676).

<sup>41</sup> Rohan Deb Roy, 'Mal-Areas of Health: Dispersed Histories of Diagnostic Category' *Economic and Political Weekly* 42(2007)2, pp.122-29. (p.123).

and is a phenomenon certainly recognised by late-century physicians. In *Geographical Pathology* Davidson noted the prejudices of Indian physicians, who were eager to attribute all disease to climate or malaria (403). However, in the same book, he propounded the existence of 'choleric' and 'typhoid' forms of malaria, falling into the same 'catch-all' trap that framed malaria as a disease synonymous with fever (319). Malaria becomes, for the physician, the quintessential tropical disease, and for the literary author, a prime candidate for signifying tropical illness and a potent biomedical metaphor for talking about encounters with the tropical world. Whether specified as malaria in the text, or simply described as fever, the generalised tropical pathology trope discussed in this section functioned as a literary device for constructing tropical spaces as spaces of moral and physical weakness. More nuanced encounters with tropical diseases, as I will discuss in the following sections, were also present in these narratives and served a different function. Diseases like sleeping sickness were used, not to express the general dangers of the tropical environment, but to explore the entanglement of institutional and imperial politics.

### **Sleeping Sickness, Sleepy Sickness: Africa and Britain.**

Sleeping sickness was publicly prominent at the turn of the nineteenth into twentieth century owing to the epidemics that were sweeping Britain's African colonies and to the work of men like Charles Laveran (discoverer of the malaria parasite, *Plasmodium*), who wrote extensively on the trypanosomiasis and won a Nobel Prize in 1907 for his investigations into protozoal (parasitic) diseases. However, it garnered further publicity in the 1920s owing to an unrelated disease

epidemic in Britain. Encephalitis lethargica or Von Economo's disease hit Europe and North America in the years 1916-1926.<sup>42</sup> Characterised by fever, headache, lethargy and, in some cases, coma, it is now thought to be caused by an autoimmune response to a rare strain of streptococcus bacteria.<sup>43</sup> However contemporaneous accounts linked the disease to the influenza virus, to meningitis, and most significantly, to sleeping sickness. Dubbed rather confusingly 'sleepy sickness' by the newspapers, encephalitis lethargica was extensively compared to human African trypanosomiasis. the *Evening Telegraph* reported in January 1920 that 'Eight or nine cases of what appears to be a new phase of the deadly "sleeping sickness" [were] puzzling the London hospital doctors'<sup>44</sup> and despite the same newspaper reporting a month later that, according to the Medical Officer of Health for Glasgow, 'there [was] absolutely no connection between this disease and sleeping sickness',<sup>45</sup> the association persisted in the lay mind. The *Aberdeen Journal*, reporting in 1921, noted the collaboration of a 'well-known scientist', who was currently working on remedies for African sleeping sickness, in the investigation into encephalitis lethargica. The scientist in question was quoted as arguing for the possibility of a blood parasite as the causative agent: "'Although of course there are no tse tse flies in England [...] one cannot say definitely that this malady is not [caused by a blood parasite]".'<sup>46</sup>

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<sup>42</sup> R. H. Wilkins and I. A. Brody, 'Encephalitis Lethargica', *Archives of Neurology*, 18 (1968), pp.324–28.

<sup>43</sup> Angela Vincent, 'Encephalitis Lethargica: Part of a Spectrum of Post-streptococcal Autoimmune Diseases?' *Brain*, 127(2004), pp.2–3.

<sup>44</sup> 'Mysterious Outbreak in London' *Evening Telegraph*, Wednesday 14 January 1920, p.4.

<sup>45</sup> 'Sleeping Sickness' *Evening Telegraph*, Friday 6 February 1920, p.4.

<sup>46</sup> 'Sleeping Sickness. Scientist and the Origin of Malady' *Aberdeen Journal*, Monday 14 February 1921, p.6. The *Aberdeen Journal* reported in 1933 of experiments regarding encephalitis lethargica in the US, whereby prisoners were given a pardon in exchange for their participation.

The *Evening Telegraph* in January 1921 again offered a connection between the diseases when it reported that 'seven cases of encephalitis lethargica—a form of sleeping sickness—were reported in Manchester'.<sup>47</sup> Indeed, the lack of discrimination in print between 'sleepy sickness' and 'sleeping sickness', regardless of the intent, led to much confusion for the public. 'The pseudo-sleeping sickness is not a tropical disease at all, but an entirely new affliction known as encephalitis lethargica' wrote the *Evening Telegraph* in 1921;<sup>48</sup> 'the name of "sleepy sickness" applied to the fresh outbreak of Encephalitis lethargica [...] is giving rise to some confusion,'<sup>49</sup> admitted the *Aberdeen Journal* in 1924, 'it [encephalitis lethargica] has no more connection with sleeping sickness than chilblains have with adenoids'. In the same year, the *Nottingham Evening Post* reported that 'a great many people continue to confuse [the two diseases]'.<sup>50</sup> Even after the epidemic had become well established, the diseases were paired for clarity—stories of African expeditions to test tropical vaccines were accompanied with lines such as: 'sleeping sickness, not to be confused with sleepy sickness.'<sup>51</sup> The impact of all this confusion was to elevate African sleeping sickness in the public imagination; articles—in their clarification—would reinforce the characterisation of sleeping sickness as an

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The experiment involved their being bitten by mosquitoes supposedly infected with the 'germs of sleepy sickness'. This reawakened the tropical connection by mimicking the transmission of parasitic diseases like malaria, elephantiasis, and yellow fever. See: [no title] *Aberdeen Journal*, Thursday 23 November 1933, p.1.

<sup>47</sup> [no title] *The Evening Telegraph*, Friday 21 January 1921, p.5.

<sup>48</sup> 'Sleeping Sickness. The Symptoms: How the Disease Develops. Hunt for the Cause.' *Evening Telegraph*, Tuesday 1 February 1921, p.2.

<sup>49</sup> 'New Epidemic Need Cause No Alarm' *Aberdeen Journal*, Wednesday 28 May 1924, p.6.

<sup>50</sup> 'Facts About the Mysterious New Epidemic' *Nottingham Evening Post*, Thursday 29 May 1924, p.7.

<sup>51</sup> 'Two Tropical Scourges. Bath Doctor Aids in Search for Remedies' *Bath Chronicle and Weekly Gazette*, Saturday 1 September 1928, p.3.



African disease involving 'a definite tropical organism'<sup>52</sup>—a clarification that perpetuated the understanding of sleeping sickness as a foreign disease.

We might argue then that the encephalitis lethargica epidemic played a part in raising the public profile of African sleeping sickness post-1920; however, we might equally argue that the inclusion of African sleeping sickness in imperial romance and detective fiction at the turn of the century helped embed the disease in the public consciousness as a comparative framework in the first place. Descriptions of the disease in Masefield's *Multitude and Solitude* attempt to explain sleeping sickness in detail for a popular audience: 'the microorganism may exist in unsuspected harmlessness for many years in the victim's blood. It is not until it enters what scientists would call the cerebrospinal fluid, or as we should call it the marrow, that it sets up the peculiar symptoms of the dread disease' (111); 'they're like little wriggly flattened membranes. Some of them have tails. They multiply by longitudinal division' (142). These detailed descriptions serve to facilitate the public understanding of science by providing medical information in a popular format. Masefield later hijacks character dialogue for the delivery of scientific knowledge, producing conversations between an amateur medical researcher and an artist that resemble professional medical debates:

"I believe that the cure (if there is one) will be got by injecting the patient with dead trypanosomes, or very very weak ones. I'm going to make a

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<sup>52</sup> '24 Cases in Nottingham in Two Months. Eight Deaths Notified' *Nottingham Evening Post*, Thursday 29 May 1924, p.7.

special artificial culture of trypanosomes in culture tubes. I shall then weaken the germs with atoxyl."

"And I," rejoined Roger, "believe that your methods will be useless. I believe that the cure (if there is one) will be obtained from naturally or artificially immunised animals" (231).

This discussion echoes the then current medical consensus, which Masefield authenticates by referring to Roger's reading of papers by Manson and Ross, as well as various articles in the *Lancet* and the *Journal of Tropical Medicine*. Although devoid of such scientific authentication, Henry Seton Merriman's novel also provides an access point for the public understanding of science, by facilitating this process of reference in reverse. The *Indian Medical Gazette* and the *Pall Mall Gazette* both referred to Merriman's novel when reporting on two sleeping sickness cases brought to London from the Congo in 1898. The latter wrote: 'The sleeping sickness, as Mr Merriman presents it, is a sudden and fatal torpor, against which men fight bitterly; and it disposes of his villain, a half-breed negro, in the most terribly dramatic way.' However, the article went on to highlight the inaccuracies of Merriman's portrayal: 'In real life the sickness is not like that', pointing out that the disease 'may take a year to run its course', unless the attack is severe, in which it 'kills in from twenty to forty days'.<sup>53</sup> In this way fiction about sleeping sickness acted as a popular framework for discussing a medical reality.

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<sup>53</sup> S.G. 'The Sleeping Sickness in a London Hospital' *Pall Mall Gazette* Wednesday, 12 April 1899, pp.1-2.

Like Merriman's novel, the article reinforced the belief that the disease only affected black people and contributed to a theory of virulence based on physiological difference by indulging in a protracted description of the patients admitted to the Charing Cross hospital as 'negroes of the extremist negroid type' (2). The temperate-tropical divide was further emphasised in the dichotomies set up by the writer: 'here was this little piece of sun-scorched humanity, drawn from his tropics, from among the sweltering rankness of jungle life, and laid down in the cold, clean whiteness of Europe'. The 'rankness' of the tropics here is representative of the unknown and thus uncontrolled nature of tropical disease, while the 'cold, clean whiteness of Europe' is representative of both the temperate climate and the relative order of Western sanitary science. In line with changing medical thought in the 1890s, this racial profiling is absent from five of our six examples of sleeping sickness stories.<sup>54</sup> 'The Adventures of a Man of Science' (1896), *Multitude and Solitude* (1909), *The Mystery of 31 New Inn* (1912), *The Dust of Life* (1915), and 'Wingéd Death' (1934) contain conspicuously European patients, whose illnesses situate them in a somatic dialogue with Africa. *Multitude and Solitude* even nods to the erroneousness of this earlier belief with the dry observation, that 'sleeping sickness must be getting worse. It attacks Europeans sometimes. Mackenzie said that in his time it never did' (120). While the protagonists of 'The Adventures of a Man of Science', *The Dust of Life*, and *Multitude and Solitude* contract the disease during a trip to Africa for profit, adventure, or research, the patient of *The Mystery of 31 New Inn* and the victim of 'Wingéd Death' have more complicated relationships with the country and its

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<sup>54</sup> The exception being *With Edged Tools* (1894).

chief disease. Congruent with the aetiology of the above article, 'The Adventures of the Man of Science' attributes sleeping sickness to a nematode parasite, *Filaria perstans*. This parasite was championed by Manson as the disease's causative agent in the 1890s, a theory that gained considerable sway with the medical press, which insisted that '*Filaria perstans* ha[d] been practically proved by Manson to be the cause of the fatal "sleeping sickness" of the Congo region.'<sup>55</sup>

Douglas M. Haynes uses Manson's *Filaria perstans* theory as a case study to demonstrate what he sees as the 'dialectical relationship' between the imperial metropole and its peripheries, and to illustrate the power that London held as a central authority in the creation of imperial knowledge. From his London base, Manson was able to mobilise a Royal Society-funded sleeping sickness expedition to investigate his hypothesis, despite having never been to Africa.<sup>56</sup> The accreditation of *Filaria perstans* as the causative agent in fiction demonstrates the impact and pervasion of the theory, as well as Manson's perceived scientific authority. The intellectual symbiosis between Britain and her colonies, exemplified by the *Filaria perstans* investigation and the Manson-Ross mentorship, afforded London unique powers to mediate and authenticate diseases occurring in the tropical world. Such mediation sometimes hindered colonial research, as bemoaned by Ross, working in British India, when trying to communicate his findings:

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<sup>55</sup> Frederick P. Henry, 'Remarks on Filaria' *Proceedings of the Academy of Natural Sciences of Philadelphia* 48(1896) pp.271-75.

<sup>56</sup> Douglas M. Haynes, 'Framing Tropical Disease in London: Patrick Manson, *Filaria perstans*, and the Uganda Sleeping Sickness Epidemic, 1891-1902' *Social History of Medicine* 13(2000)3 pp.467-93. (p.469).

By an absurd rule I am not permitted to publish a word or even hint on my work without reference to the Secretary of State for India (London). It takes months to obtain his sanction.<sup>57</sup>

However, other times this intellectual symbiosis provided fruitful connections for both sides, as exemplified by the Ross-Manson correspondence, which reveals that while Ross provided Manson with details of his findings to bolster malaria debates at the British Medical Association, Manson provided Ross with practical advice for best observing *Amoeba coli* and *Plasmodium* parasites under the microscope.<sup>58</sup> This highly politicised relationship was reflected in fictional explorations of tropical disease, which recognised the significant role played by Britain's capital city. In Joseph Hocking's *The Dust of Life* (1915), for example, the analysis of its titular compound, which has the ability to cure sleeping sickness, by a British chemist working in Africa is not adequate. Rather it must be analysed for a second time by a London expert before being universally accepted.

More broadly, Haynes' dialectical relationship is recognisable in the narrative juxtaposition of England and Africa. Merriman's *With Edged Tools* features a double-plot set alternately in London and Loango, constructing England and Africa in parallel. Even before the second narrative appears, Africa begins to encroach on London. Its landscape is reconstructed in a conservatory from which the music of the debutante ball-room can be heard, amid 'tropical ferns [...] languorous scented flowers [...] graceful palms and bananas' (14). A great deal of care has been devoted to the conservatory we are told, as Africa is 'the coming

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<sup>57</sup> London, LSHTM. RC. Ross/17/02. Ross to George Nuttall, 17 September 1898.

<sup>58</sup> See: W.F.Bynum and Caroline Overy, eds. *The Beast in the Mosquito: The Correspondence of Ronald Ross and Patrick Manson* (Amsterdam: Rodopi, 1998).

country' (22). However, this English understanding of Africa is 'created as much as discovered' (as David Arnold notes of the tropics generally).<sup>59</sup> Amid the languorous scented flowers are 'a thousand tiny lights', 'half hidden', which quite literally cast the tropics in an artificial English light. John Masefield's *Multitude and Solitude* (1909), Joseph Hocking's *The Dust of Life* (1915), and H. P. Lovecraft's 'Winged Death' (1934) also include plot lines that feature both the imperial metropole and the periphery. In *Multitude and Solitude* the two countries inhabit separate parts of the novel, positioned to offer narrative contrast between the multitude of London and the solitude of darkest Africa. However, they resist these structural boundaries through allusion and analogy. For example, when Roger Naldrett and Lionel Heseltine build a makeshift camp in Africa, they name it 'Portobe' after the house in Ireland that belonged to Roger's sweetheart. Though 'not a very good house' and 'structurally weak' (225), it protects them from the 'savage', 'untamed', 'cruel' African continent (227). Roger Naldrett's very decision to travel to Africa is intimately bound up with his travels in Ireland and the death of his Irish lover. A series of mysterious signs bring the plight of sleeping sickness to his attention, including prophetic dreams and scraps of newspaper floating in the wind. As he walks through the village of Torneymoney, a navy man plays a song on the banjo:

O I'm so seedy,

So very seedy,

I don't know what to do,

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<sup>59</sup> David Arnold, "'Illusory Riches': Representations of the Tropical World, 1840-1950' *Singapore Journal of Tropical Geography* 21(2006)1 pp.6-18. (p.10.)

I've consumption of the liver  
And a dose of yellow fever  
And sleeping sickness, too (120).

This improvised ditty vocalises the common plight of the navy seaman—tuberculosis, yellow fever, and sleeping sickness, representing just some of the diseases he might contract on his travels abroad, and bring back to his homeland. The increasing globalisation of the Western world is emphasised by the presence of 'Oriental bowl[s]' (93), 'a worn old Panther skin' (115) shot in India, and 'Chinese lanterns' (120). However this globalisation comprises, not authentic cultural objects, but commodities and disease.

Merriman's *With Edged Tools*, also presents this narrative contrast, locating the difference between England and Africa in etiquette and social reputation (concepts functionally important to civilised society). Lady Cantourne advises African traveller Guy Osgard not to 'run away' from the inquest into his father's death to hunt a hippopotamus, warning 'it does not matter being upset in an African river; but you must not be upset in London by an inquest' (34). The geographical remoteness of Africa and degenerative impact of its topography excuse the immorality of Osgard and Meredith's unwitting involvement in the slave trade, while Thomas Osgard's consumption of belladonna to put an end to his own suffering threatens to scandalise his son. Thus England is presented as subject to higher moral scrutiny than Africa. John Masefield's England in *Multitude and Solitude*, however, is just as morally polluted as his Africa. His characters attempt to elucidate where moral influence should come from, arguing

in favour of Art and military service as moral frameworks: 'Art [...] is moral occupation' (133), 'the military virtues are the bedrock of character' (135). The scientific and technological advancements of the nineteenth century are made responsible for moral inconstancy, problematising their relationships to civilisation. Later in the narrative, native Africans steal Roger and Lionel's store of medicinal drugs and Lionel exclaims: 'Why didn't I see that Africa is getting civilised?' (224). The civilisation of Africa is here synonymous with the use of western medicine. However, the civilisation process in this case problematically necessitates theft. Embodied in this observation is the suggestion that civilisation relies on western medical science and its triumph over disease. However, the theft of resources to acquire this civilisation might be read as a critique to be refracted back onto the imperial relationship.

Despite Masefield's positioning of England and Africa in parallel, the relationship between the metropole and the periphery is not simply one of cultural hierarchy, rather it is complicated by the positing of a shared history. Africa is characterised as a primitive land, the river they sail on is 'like a river of a beginning earth' (175); however, amid the wilderness there are echoes of England. Roger observes a hill, which juts up 'exactly like a Roman camp, which he had visited in England long before, one Christmas day' (177). He takes comfort from this sighting and its European connotations: 'it was like a Roman camp, like military virtue, order, calm, courage, dignity' (177). The presence of such a structure connects Africa and its inhabitants to a period in England's prehistory, as well as endorsing the relative order of imperial rule. This same connection is made by Felix Oswald in the preface to his 1915 treatise *Alone in the Sleeping-*



*Sickness Country*, when he compares the behaviours of the Caledonians of Scotland in A.D 208 to African tribes, arguing that they—Africans—'[belong] to a similar stage of the Early Iron Age'.<sup>60</sup> The Roman colonisation of Britain is paralleled with the British colonisation of Africa, and Oswald's journey into the heart of that country strikes him as like 'whirl[ing] backwards in the world's history for a period of two or three thousand years' as in a 'time machine'.<sup>61</sup> This comparison suggests that Africa is on a trajectory similar to the trajectory of ancient Britain, that one day with the help of a great empire, Africa too might become civilised. However, the placement of Britain and Africa at different places on the same progressive cultural timeline constructs analogies that pose threats to Britain's position as a civilised nation. If Africa represents a vision of Britain in its infancy, then contact with this precursor nation could have a degenerative impact on Britain, as surely as it might have an edifying impact on Africa.

Pamela Gilbert has argued that, to the British imagination, the tropics represented 'a sullied Eden, a condition of humanity simultaneously childlike and degenerate',<sup>62</sup> a sentiment that expresses the dual position of tropical spaces as both innocent and dangerous. However, as she argues, the primitive ecology of the tropics, conceived in binary opposition to British civilisation, was being located uncomfortably close to home in the form of the London slum: 'hot, steamy, and crowded, they [slums and factories] artificially produced the miasmatic environment that was figured as natural in the tropics'.<sup>63</sup> The location of

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<sup>60</sup> Felix Oswald, *Alone in the Sleeping-Sickness Country* (London: Kegan Paul, Trench, Trubner, and Co, 1915) p.vi-vii.

<sup>61</sup> Oswald, p.vii.

<sup>62</sup> Pamela Gilbert, 'India in the 1860s: Mapping Imperial Difference' *Mapping the Victorian Social Body* (New York: State University of New York, 2004) p.183.

<sup>63</sup> Gilbert, pp.274-75.

tropicality within English city life queried the progress of Western civilisation and connected the two geographical spaces using the discourses of disease. Indeed, Masefield's descriptions of London are saturated with pathology. He notes newsboys with 'debased, predatory faces', peering with 'ophthalmic eyes' and describes pedestrians as 'symptoms of disease' passing by (173), comments that indicate a universal anxiety about ill health. When discussing the risks of working in Africa, Lionel Heseltine insists that 'doctors face far worse things in London everyday' (146). Thus disease reveals the similarities between these two geographical spaces as an articulation of the powers of unbridled Nature. Despite this recognition of ill health in the heart of empire, as well as its peripheries, *Multitude and Solitude* maintains a geographical and cultural hierarchy by broadly representing the diseases of Africa as more fatal and its inhabitants as more primitive.

The threat posed by the tropical world, synonymous with tropical disease, is expressed in Masefield's closing lines, wherein he impresses the importance of curbing 'Nature, the enemy' (299) to Man's use, and notes that, as it stands, man 'walks sentenced, a prey to all things baser' (300). The desire to 'curb' the natural world to man is an extension of the British imperial project, as sold by the parasitology brand. This legitimising narrative propounded the idea that successful imperial dominion—and by extension a powerful British Empire—relied on the prowess of British parasitology. This new sub-science, they argued, directly facilitated European colonisation of tropical spaces, and moreover, by providing the tools to vanquish diseases of warm climates, already associated by

Manson with 'backwards social [...] conditions',<sup>64</sup> they provided the tools to vanquish colonial primitivism. This rhetoric is recognisable in Masefield's, and other's, depictions of western scientific authority, which I will take a closer look at in the following section.

### **The 'New' [British] Sanitary Science: A Study in the Public Understanding of Nationhood.**

At the end of *Multitude and Solitude*, Masefield attributes the 'ills of modern life' to a want of order, a want of order that also occurs in tropical spaces from a lack of civilisation. He identifies western medical science as a way of reinstating order in both the imperial metropole and her colonies. Masefield, through the mouthpiece of Roger, urges: 'Let us build up an interest in the new hygiene and the new science; in all that is cleanly and fearless' (299). This is intended to improve not only physical health, but mental and moral health too. The rallying cry to his companion, as well as his reader, attempts to instil an interest, for the general public, in the causes of sanitary science. Masefield, who was close personal friends with Ronald Ross (editing his collected poems and writing an obituary upon his death), would have been familiar with Ross's scientific and political work, wherein Ross argued that the public did not appreciate the magnitude of the discoveries of science owing to ignorance and lack of interest. To this end Masefield and Ross appear to share a similar attitude to the merits of what we would now call interdisciplinarity. At a time when parasitology was attempting to strengthen disciplinary boundaries in order to justify its relevance to science, the influence of the literary imagination on the discipline came into full force. The

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<sup>64</sup> Patrick Manson, *Tropical Diseases: A Manual of the Diseases of Warm Climates*, p.xx.

importance of literary frameworks for the public understanding of science is evidenced in the reception of *Multitude and Solitude*, which a review from the *Bookman* in 1909, claimed was 'an all-absorbing study of that most interesting disease, Sleeping Sickness.'<sup>65</sup> The *North American Review* similarly highlighted the novel's power in bringing science into the purview of everyday life: 'The greatest value of [this] novel lies in its clear, intense expression of the thoughts and feelings connected with really fundamental things—art, love, religion, science, work.'<sup>66</sup> Masefield identifies the suitability of sanitary science for a twentieth century audience when Lionel urges Roger to write a play about 'Man and the Trypanosome', which Roger notes would have 'all the requirements of a modern play: strength, silence and masculinity' (148). The description, in conjunction with Roger's characterisation, supports the framing of parasitology, analysed in chapter two, as predominantly a narrative of white, western men. Masefield's choice of topic for his novel perhaps reflects his protagonist's assertion that 'Science is the art of the twentieth century' (138). Masefield's playwright protagonist and his amateur scientist companion enact the complex relationship between Art and Science. As Jack Ross argues, Roger's obsession with sleeping sickness in the novel parallels the young Masefield's own desire to become a doctor and study yellow fever.<sup>67</sup> In 1941 Masefield wrote that he had 'longed to work at that enemy, and to help find 'its unseen, small, but million-murdering cause'.<sup>68</sup> In quoting this line from Ross's poetry, Masefield's assertion

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<sup>65</sup> 'Multitude and Solitude by John Masefield' Rev by Grant Richards *Bookman* 37(1909)217 p.58.

<sup>66</sup> 'Multitude and Solitude by John Masefield' rev. by *North American Review* 204(1916)733 pp.941-42.

<sup>67</sup> Jack Ross, 'The Early Novels of John Masefield, 1908-1911' (MA Thesis, *The University of Auckland*, 1985) Chpt 4, n.p.

<sup>68</sup> John Masefield, *In the Mill* (London: Macmillan, 1941) p.95.

demonstrates the utility of poetry in expressing his emotional relationship to science, and moreover, compounds Ross's high profile position as a model of scientific and cultural authority.

Beyond simply charting the infiltration of scientific ideas into fictional works—as indicated by the changing representations of racial predisposition and transmission pathways—I seek to demonstrate that literary descriptions were used as reference points for scientific discussion by engaging with disciplinary politics. Hocking, Masefield, and Lovecraft's narratives all make reference to the scientific politics of empire, particularly those surrounding the thorny issue of authority. In *The Dust of Life*, protagonist Cedric Essex owes his recovery from sleeping sickness to 'native' intervention, not European medicine, but must obtain London's approval before he can share 'his' ground-breaking discovery (really the discovery of the African prince Sunflower). Roger Naldrett, of *Multitude and Solitude*, while discovering an effective serum for curing the disease and almost losing his life in the process, returns to Europe only to find that a Japanese researcher has beaten him to it. Tackling the politics of the profession head-on, Lovecraft's protagonist, Dr. Thomas Slauenwite, in 'Winged Death' (1932), hijacks the practice of sending samples home for analysis in order to enact revenge on a colleague who robbed him of scientific precedence.<sup>69</sup>

The bitterness between Slauenwite and his rival, Henry Moore, although extreme, bears some resemblance to the realities of turn of the century

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<sup>69</sup> It is perhaps prudent to note that Lovecraft's tale is American. However, I believe it uses an imperial framework congruous with the British model. American Parasitology was founded by Joseph Leidy in 1846. H. B. Ward, president of the Helminthological Society of Washington founded the *Journal of Parasitology* in 1914, taking considerably inspiration from George Nuttall's British journal *Parasitology*. Stephen Gillespie and Richard D. Pearson, *Principles and Practice of Clinical Parasitology* (Chichester: John Wiley & Sons, 2003) p.14.

parasitology research, where the draw of receiving credit often trumped the benefits of working together. The most prominent example of such a rivalry is the bitter dispute between Ronald Ross and Giovanni Battista Grassi for priority in the mosquito-malaria discovery.<sup>70</sup> The extent to which tropical research was a national affair is reflected in private research correspondence, in which Manson urges Ross to be wary of international competitors: 'The Frenchies and Italians will pooh pooh it at first, then adopt it, and then claim it as their own. See if they don't. But push on with it and don't let them forestall you,'<sup>71</sup> and in letters from friends in which Ross is congratulated with the addendum: 'you have done the trick and I congratulate you heartily and I congratulate ourselves for do you not belong to us? And you are no Italian, French or German but a plain Briton!'<sup>72</sup> Manson even warned Ross about the advancements in foreign research on malaria, clearly making it about British priority, not about a solution to prevent human suffering: 'It is evident the Italians are now on the scent. I do hope you will run into the quarry before them. Bignami is a clever little fellow and ambitious. Laveran is working up the Frenchmen. I do not hear that the Germans are moving but they will and so will the Russians. Cut in first.'<sup>73</sup>

By incorporating the political nuances of parasitological research into their plot lines, the fictions analysed in this thesis demonstrate the ways in which medical knowledge was framed by disciplinary power play. The ending of

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<sup>70</sup> See for example: Edwin R. Nye and Mary E. Gibson, *Ronald Ross: Malariologist and Polymath. A Biography* (London: Macmillan, 1997); Ernesto Capanna, 'Grassi versus Ross: Who Solved the Riddle of Malaria?' *International Microbiology* 9(2006)1 pp.69-74; Gordon C. Cook, *Tropical Medicine: An Illustrated History of the Pioneers* (London: Elsevier, 2007)

<sup>71</sup> Patrick Manson, 'Letter 19 02/007' *The Beast in the Mosquito: the Correspondence of Ronald Ross and Patrick Manson* eds. W.F. Bynum and Caroline Overy (Amsterdam: Rodopi, 1998) p.55.

<sup>72</sup> London, LSHTM. RC. Ross/48/36. Manson to Ross, 31 Sept 1898.

<sup>73</sup> Patrick Manson, 'Letter 48 02/018' *The Beast in the Mosquito*, pp.124-25. (p.125).

*Multitude and Solitude* imaginatively plays out the anxiety embodied in Manson's appeal to Ross to 'cut in first', while *The Dust of Life* illustrates the legitimising power of British sanction. The story follows British man Cedric Essex, who is expelled from his prestigious school after being framed for cheating in an exam. Fleeing his ruined reputation, he moves to the Cornish town of Perranzeth, where he saves a young woman from drowning in the sea. However, wherever he goes he is met with hostility and plagued by the slanderous rumours that his best friend, Roger, has been spreading behind his back. Cedric eventually agrees to go on an expedition to Africa, where he contracts sleeping sickness and is considered as good as dead. When Cedric makes a miraculous recovery from the disease, it is due to his consumption of a substance called 'the dust of life', which later turns out to be a naturally occurring compound containing large amounts of radium.<sup>74</sup> However, upon his return to England he is shunned by society as a liar and a coward by those who do not believe recovery from the disease is possible. In the absence of corroboration from Cedric's travelling companions (who continue in their travels and are unreachable) and hearing further slanderous remarks from Roger, the community believe that Cedric had pretended to contract the disease in order to escape the perils of tropical exploration.

This is where the degenerative and pathogenic geographical associations that I outlined in the first part of this chapter interact with these fictionalised disciplinary politics. Cedric's somatic relationships with Africa, both pathological and curative, taint his reputation by appearing to contradict his honour as a British gentleman; 'I need scarcely say that no English gentleman would have any

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<sup>74</sup> The positing of the sleeping sickness cure as radium-based engages with the radium craze of the early twentieth century, which saw a myriad of radioactive products sold as health improvers and panaceas.

use for anyone guilty of such things', asserts society heavyweight, Colonel Carvossa (238). The 'thing' that Carvossa thinks Cedric is guilty of is the practice of malingering. Cedric's encounters with Africa lend support for this belief by first facilitating his infection with an apparently fatal disease, and then offering him a cure in the form of a locally derived, but undiscovered (and thus unconvincing) panacea. Significantly, this panacea is only 'undiscovered' by Europeans, being well known by the African prince Sunflower. Indeed, the curative powers of the compound are only fully recognised after Cedric returns to England and has a British 'expert' in London confirm the analysis of the chemist in Luanda—a fact that appears to comment on the politics of scientific authority, as bemoaned by Ross when he had to seek London's authority before publishing his findings. Cedric's somatic relationships with Africa, however, are not wholly negative. Once sanctioned by British authorities—a British-born missionary corroborates Cedric's story and 'the dust of life' validated by a London chemist—these relationships work to transform Cedric's life for the better and strengthen his social identity. Now his African experiences signify his own heroism (having saved his friend Roger from first a lion, and then a volcano whilst there) and the lucrative enterprise that will make him an eligible bachelor and enable him to marry the woman he loves.

Hocking employs many of the motifs I analysed earlier in this chapter to perpetuate the negative perceptions of the colonies, but then uses imperial frameworks to challenge these perceptions and in the process reinforces rightful imperial hegemony. Despite Cedric's 'vigorous young life' and 'splendid physique', which enable him to overcome many of the hardships and 'evil effects'



of tropical travel (102), he cannot overcome Africa's chief disease and admits that 'since [he] passed through that marshy district, and those blessed tsetse flies bit [him, he had] been like a man poisoned' (106). Although he escapes death thanks to the altruism of an African, this African is a Christian convert whose support of Cedric is framed as a displaced gratitude to the British missionary who converted him. Thus the 'civilised' tribesman that Hocking describes has British imperialism to thank for his newfound morals. Cedric's recovery is not enough to counteract Africa's 'poison[ing]' influence. The socially degenerative impact of colonial travel depicted in *With Edged Tools* and *Multitude and Solitude*, is encoded by British society's rejection of Cedric upon his return. His experiences in Africa have tainted his reputation, and it is only once those experiences have been neutralised by British sanction that he can regain his heroic masculine identity.

In the following section, I will explore in more detail the somatic relationships that are constructed in fiction between British travellers and tropical landscapes. The contraction of tropical diseases by these individuals signify their past associations with such landscapes and thus function as complex frameworks for exploring the encounter between the metropole and the periphery. In fiction, these somatic relationships have a significant impact on the perceived social identity of the individual in question. I have identified detective fiction as a particularly significant locus for the exploration of this dynamic relationship, owing to the work that such fiction does in constructing and maintaining ideas about social and national identity.

## Detecting the Diagnosis: Parasitology and Detective Fiction at the Fin de siècle

I had studied Eastern diseases with care, and was well acquainted with the peculiar nature of this strange parasite. Was it possible that I held in my hand the means of clearing my friend?<sup>75</sup>

Upon examining some blood at the scene of a murder, scientist Mr. Gilchrist utters these words. His friend Harry Lidderdale has been framed for the murder of his old flame, Alma Colthurst, whose death had been prophesied the night before by a Brahmin chiromancer. Being the kind of man of science who carries his laboratory with him wherever he goes—'I suddenly remembered that I had some microscopical slides and a cover glass in my pocket'—Gilchrist is able to investigate on behalf of his friend and obtains a sample of the killer's blood left on a broken wine-glass. Gilchrist's recognition of the nematode parasite *Filaria perstans* in this sample of blood leads to the absolution of his friend by the incrimination of another, who, critically, displays the symptoms of African sleeping sickness. Although based on erroneous epidemiology—sleeping sickness is caused by *Trypanosoma spp.*, not *Filaria perstans*—this story demonstrates the blurring of the medical and legal professions, by emphasising the similarity between their intellectual methods, including the gathering and analysis of evidence. In *Multitude and Solitude*, Roger and Lionel employ a similar analytical method to draw conclusions about a crime committed by their African comrades:

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<sup>75</sup> L. T. Meade and Clifford Halifax, 'The Adventures of a Man of Science, IV - The Sleeping Sickness' *Strand Magazine* 12(1896) p.401-14. (p.411).

"Look here," said Lionel. "What do you make of these marks?" In one place the mud had been planed smooth in a long plastering smear, ending in a notch or narrow groove.

"That was made by the boat," said Roger.

"Yes," said Lionel. "That was the boat. You can see the puncture in the mud there. That was made by the projecting screw in the false nose. You remember the screw we put in at Malakoto? They shoved it off here."

"Yes. No doubt. That is the screw. So they've sampled the goods and gone."<sup>76</sup>

In both cases the microscope training of the British protagonists provide them with the observational skills needed to solve the mysteries. The protagonists in these stories are scientists, but their activities are those of the legal detective in the detection of crime.

Much scholarship in literature and science has recognised the confluence of the representation of these two professions; Rapezzi *et al.* argue that "'detective work' has long been considered a metaphor for clinical acumen' and highlight the professions' dual attempts to restore the 'status quo' disrupted by crime or disease.<sup>77</sup> In the nineteenth century, Arthur Conan Doyle highlighted this methodological dialogue by creating an archetypal detective who 'would treat crime as Dr Bell [his mentor] treated disease' and 'where science would take the

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<sup>76</sup> Masefield, *Multitude and Solitude*, p.212.

<sup>77</sup> Claudio Rapezzi, Roberto Ferrari and Angelo Branzi, 'White Coats and Fingerprints: Diagnostic Reasoning in Medicine and Investigative Methods of Fictional Detectives' *British Medical Journal* 331(2005)7531 pp.1491-94. (p.1491).

place of chance.<sup>78</sup> Jon Thompson emphasises 'the hybrid nature' of Doyle's Sherlock Holmes stories, which he identifies as a conflation of adventure fiction, sensation fiction, and Poe's ratiocinative detective formula. He identifies a dialogue between what Foucault recognises as the emergence of a disciplinary society in the nineteenth century, and Poe's conceptualisation of the detective. Poe's detective fiction, upon which Doyle's is modelled, articulates 'a desire for a complete form of knowledge' that reflects the developing 'scientific' mode of knowledge, which revolutionised modern American—and British—culture.<sup>79</sup> Likewise, in *Detecting the Nation: Fictions of Detection and the Imperial Venture*, Caroline Reitz argues that a new detective figure emerged over the course of the nineteenth century and was uniquely suited to 'maintaining social order in a complex new imperial world [...] because his authority stemmed from knowledge rather than force and because his knowledge promised mastery of a specifically imperial world.'<sup>80</sup> This recognition of the detective's privileging of knowledge, and the centrality of this knowledge to obtaining mastery over the imperial world, makes the figure a strikingly apt analogue for the parasitologist or tropical pathologist, who, at the end of the nineteenth century, was fast becoming an essential asset to British imperial rule by providing practical solutions to the epidemiological obstacles of colonising warm climates. Thus, I forge my analysis against the framework of the turn of the century detective and his dialogue with the diversification of medical science into research specialisms. Like the

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<sup>78</sup> London, British Library. Early Spoken Word Recordings. 1CL0013693. 'Conan Doyle Speaking 1 of 2', 14 May 1930.

<sup>79</sup> Jon Thompson, *Fiction, Crime and Empire: Clues to Modernity and Postmodernism* (Chicago: University of Illinois Press, 1993) pp.44-45.

<sup>80</sup> Caroline Reitz, *Detecting the Nation: Fictions of Detection and the Imperial Venture* (Columbus: The Ohio State University Press, 2004) p.xiv.

modern detective, the tropical researcher possessed an unparalleled knowledge of colonial spaces, which facilitated the continued legitimacy of imperial rule at a time when imperial self-doubt was beginning to creep into some sections of the populace. I support Reitz's argument about the significance of the continuities between 'the [fictional] detective who treats crime and the [fictional] explorer who performs the work of imperial administration' (xiv). However, I will argue that this relationship, although appearing allegorically in fiction, had a real-life impact on the reception of the tropical pathologist, who carried out 'detective work' in dialogue with, or as a consequence of, his role as an imperial administrator—the fictional detective as an archetype and the tropical pathologist as a professional figure entered into a reciprocal relationship that played out in the cultural imagination.

Although Doyle's attempt to rebrand the detective is the most well known, it is by no means the only example of the significance of, not just scientific thinking, but scientific knowledge to depictions of the detective at the turn of the century. R. Austen Freeman's Thorndyke mysteries emphasise the relationship between law and science through the introduction of protagonist Dr. Thorndyke, a medical jurispractitioner—originally a doctor, who subsequently qualified as a barrister. The stories are narrated by Dr. Christopher Jervis, who functions as Watson does to Holmes, and serves to emphasise the analogy between the two figures. Both Holmes and Thorndyke try to mentor their colleagues in order to demonstrate the teachability of the science of detection, however both repeatedly outshine their companions, ultimately highlighting their companions' inferior skill sets. The possession of an unparalleled analytical gaze, in part, explains this prowess—

corresponding to the microscopical finesse of the research scientist over the doctor—however, the real success of Holmes and Thorndyke is often more adequately explained by their possession of specialised knowledge. This specialised knowledge is of particular significance to colonial doctors whose lack of knowledge regarding tropical disease was recognised as a serious imperial problem by parasitologists.

As I outlined in Chapter Two, parasitologists recognised the need for proper training in tropical medicine as part of the medical curriculum, arguing that it was only by experience, often dearly bought, that doctors became acquainted with tropical disease agents and their remedies. The emergence of research scientists who specialised in tropical aetiologies coincides with the emergence of the scientific detective, both of whom represented figures with niche knowledge and a specialist skill set. I argue that the professional identities of parasitologists were influenced by the prominence of the detective in the cultural imagination, and, furthermore, that the popularity of the detective figure itself was also bolstered by the cultural visibility of parasitologists, who were framed (by themselves) as imperial 'knights of science' who protected the Empire.

In the previous section, I discussed the political overtones of tropical disease and the importance of a dialogic relationship between Britain and her colonies in shaping nineteenth century understandings of it. The work that both fictional disease and fictional detectives do in threatening and protecting, respectively, British nationhood makes them fitting bedfellows for critical analysis. In this section I will analyse five detective stories in which parasitic

disease forms a major plot point in a bid to elucidate the complex dialogue between parasitic disease and national identity.

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Caroline Reitz observes that both Kipling and Doyle, writing in the 1880s, produced detectives who reimagined the nation by 'reimagin(ing) national authority'.<sup>81</sup> She compares Kipling's fictional detective, Strickland, with Doyle's Holmes, both of whom possess an encyclopaedic knowledge of their environment. Reitz draws our attention to the significance of this creative historical moment. Indeed this moment produced not just various iterations of the 'scientific' detective, but, as I have demonstrated, a number of adventure romance stories preoccupied with tropical medicine, and, as I discussed in chapter two, the parasitology 'brand', all of which participated in a reimagining of national authority as, at least partly, inflected by scientific authority. Doyle drew on his medical education and admiration of Poe's detective fiction<sup>82</sup> to produce Holmes, endowing him with the unparalleled insight and resourcefulness, which parasitologists would later claim as a chief aspect of their professional identity.

In *A Study in Scarlet* (1887), Holmes announces to Watson that 'the grand thing is to be able to reason backwards'.<sup>83</sup> He considers reasoning backwards synonymous with reasoning 'analytically' and further explains: being given a result and having the ability 'to evolve from [one's] inner consciousness what the

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<sup>81</sup> Reitz, p.65.

<sup>82</sup> Arthur Conan Doyle, *Sir Arthur Conan Doyle: Memories and Adventures: An Autobiography*, (Ware: Wordsworth Editions, 2007) p.62.

<sup>83</sup> Doyle, 'A Study in Scarlet', *The Complete Stories of Sherlock Holmes* (1887; Ware: Wordsworth Editions, 2008) pp.13-96. (p.90).

steps were which led up to that result.<sup>84</sup> This process is remarkably similar to the intellectual method that Ross identifies when engaged in his malaria work. Ross's experiments were designed to fill in the blanks on the journey between *Plasmodium* parasites in the stomach of the mosquito and in the blood of man, to work out the steps that led up to the contraction of malaria. It is evident that Ross envisaged his work as underpinned by this *a priori* method of study, which involved 'commenc[ing] with observed statistics, endeavour[ing] to fit analytical laws to them, and so work[ing] backwards to the underlying cause'.<sup>85</sup> In 1916 he extended this *a priori* methodology to his work on the prediction of epidemics, using malaria as a case study.

The methodological similarity between Doyle's detective and Ross places them in dialogue with each other and with the culture that produced them. Doyle, who was introduced to Ross in 1914 through mutual friends, wrote that Ross 'ha[d] always been one of [his] heroes of real life'.<sup>86</sup> His admiration of Ross might have been derived from the recognition, in him, of something resembling Holmes. Certainly the detective and the tropical pathologist share many commonalities. The detective's application to, and immersion in, specific cases parallels the parasitologist's preoccupation with a single disease or medical problem. Ross certainly considers himself a detective, years later, when writing his memoirs, in which he refers to the tribulations of the malaria problem in terms of 'clues', 'false scents', and 'wrong leads'. Patrick Manson similarly talks of 'following up false

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<sup>84</sup> Doyle, 'A Study in Scarlet', p.91.

<sup>85</sup> Ronald Ross, 'An Application of the Theory of Probabilities to the Study of *a priori* Pathometry. Part I' *Proceedings of the Royal Society of London*. 92(1916)638 pp.204-30. (p.205).

<sup>86</sup> London, LSHTM. RC. Ross/146/16/69. Doyle to Lady Cowan. January 1914.



scents' in his filaria work.<sup>87</sup> Although I am not arguing that Ross had a direct influence on Doyle's characterisation of Holmes (the dates do not line up), or indeed that Ross modelled himself on Doyle's detective, I am arguing that both Holmes and Ross embody allied heroic positions in the cultural consciousness, sharing a distinct type of scientific outlook that is overtly concerned with national and imperial identity. Doyle's fictional scientific detective and the professional identities crafted by parasitologists like Ross, were ultimately produced from, and received by, a cultural zeitgeist that was acutely aware of the porousness of national boundaries.

The porousness of such boundaries formed a major component of the detective genre in the late nineteenth century, which often dealt with the problem of foreign invaders preying on British subjects and scandalising British cities—an invasive problem that might be taken as analogous to the parasite-host dynamic and considered in relation to the role of the parasitologist. This is a metaphor that builds on Laura Otis's conception of Doyle's detective fiction as enacting an imperial immune response. She argues that 'Holmes [...] acts as an imperial leukocyte or antibody',<sup>88</sup> sticking close to his suspects until he identifies them—a fitting metaphor for the detective-criminal dynamic and one that I would argue takes on particular significance in light of Ross's conception of the immune system, wherein he notes that 'phagocytes have often been considered to be the policemen of the blood'.<sup>89</sup> In Ross's own understanding, antibodies fulfil the identifying function of the detective, in preparation for phagocytes, who 'instead

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<sup>87</sup> Qtd by George Newman, *The Rise of Preventative Medicine* (Oxford: Oxford University Press, 1932) p.207.

<sup>88</sup> Laura Otis, 'The Empire Bites Back: Sherlock Holmes as an Imperial Immune System' *Studies in 20th Century Literature* 22(1998)1 pp.31-60. (p.33).

<sup>89</sup> Ross, *Memoirs* p.138

of arresting the culprit, swallow him on the spot' (138). Detective fiction's preoccupation with identifying 'self' and 'other',<sup>90</sup> not only evokes the metaphor of an immune response (and vice versa), but also dovetails with many of the discourses of parasitic disease, especially those discussed in chapter one, which sought to elucidate the relationship between host and parasite.

The confluences that I draw between the scientific detective and the parasitologist, or between the detection of crime and the detection of parasites, are underpinned by the intersection of complex parasitological and social discourses. In 1902, Max Nordau redefined crime as 'human parasitism', holding criminal activity to be, at its base, social exploitation.<sup>91</sup> J. A. Hobson also made this connection, identifying 'the lower grades of the criminal classes' as constituting the largest and simplest order of social parasites.<sup>92</sup> He emphasised their analogy to biological parasites by arguing that in these individuals 'the general test of parasitism—degeneration—is plainly visible.'<sup>93</sup> The connection between social and biological parasitism, discussed at length in periodicals like the *London Quarterly Review*,<sup>94</sup> encouraged anxiety about the fitness of the British race and characterised the criminal as a threat to the social and political health of the nation, in the same way that biological parasites were seen as threats to the somatic health of the individual. Thus we can see how the detective, by weeding out these

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<sup>90</sup> Otis, 'The Empire Bites Back' p.32.

<sup>91</sup> Max Nordau, 'What is Crime?' *Review of Reviews* 26(1902)155 p.501.

<sup>92</sup> J. A. Hobson, 'Social Parasitism' *The English Review* (1910) pp.347-58. (p.352).

<sup>93</sup> J. A. Hobson, 'Social Parasitism', pp.352-35.

<sup>94</sup> See: e.g. 'ART IV. - Degeneration, a Chapter in Darwinism' *London Quarterly Review* 56(1881)112 pp.353-66.

social threats, might find imaginative confluence with the parasitologist, whose profession involved neutralising biological threats to the body.

Although inspired by the empirical methodologies common to many medical and scientific researchers, Doyle produced a detective whose specialist skill-set would, thanks to the parasitology narrative, call to mind the parasitologist or tropical pathologist. Parasitologists and the authors of detective fiction both offered the general public archetypes that would socially and scientifically protect the British nation. Otis notes that 'the British loved Holmes for the same reason that *fin-de-siècle* Europeans admired scientists',<sup>95</sup> both embodying, as she argues elsewhere, 'imperial knight[s] who serve [their] empire through [their] enhanced vision.'<sup>96</sup> This romanticised archetype of the imperial knight defending the British Empire drew on the same mythology of nationhood that I argue parasitologists did in the narration of their discipline. Significantly, this involved the possession of a superior scientific gaze, contributing to the valorisation of Western medical authority, and was in dialogue with Britain's 'civilising mission'—a relationship at the forefront of Doyle's depiction of the west coast of Africa in his autobiography, which he presents as a place of intense heat, mutinies, and disease—to his mind, a place in need Western medical care. He reminds us that this was 'the days of malaria and black water fever, before Ronald Ross and others had done their great work of healing and prevention'.<sup>97</sup> The healing work of Ross, helping to reduce the 'price' of the colonies for Europeans (41), embodies the spirit of Doyle's archetypal detective,

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<sup>95</sup> Otis, 'The Empire Bites Back', p.2.

<sup>96</sup> Laura Otis, *Membranes: Metaphors of Invasion in Nineteenth-Century Literature, Science and Politics* (Baltimore: Johns Hopkins University Press, 1999) p.98.

<sup>97</sup> Doyle, *Sir Arthur Conan Doyle: Memories and Adventures*, p.41.

an ideological commonality that many journalists would recognise when reporting on the work of tropical medicine.

Thompson argues that, as a supporter of imperialism and empire, Doyle, through his fiction, 'ratified the principles and ideologies of an imperial, patriarchal Britain' in ways that facilitated a popularisation and humanisation of empiricism and the scientific method.<sup>98</sup> Thompson connects empire and the scientific detective, arguing that both represent the same 'myth of England' (77). In this way detective fiction contributed to a hermeneutic framework that underpinned the politics of parasitology; the scientific detective, embodying a myth of England that prioritised both empire and empiricism, provided an archetype for understanding the emergent parasitologist. This understanding is most evident in the lay-press. The *Times* in 1922 eulogised tropical medicine giant Patrick Manson as a 'builder of the British Empire', who inspired 'that great band of British workers' and provided 'world-citizenship of the white man'.<sup>99</sup> The importance of the discipline to British imperialism, and by extension nationhood, could not be understated and significantly both Manson and the birth of the discipline were framed by detective fiction's most famous archetype. The article located the 'hour in which tropical medicine was to be born' as the hour in which Manson put together his evidence for the mosquito vector of elephantiasis, 'like Sherlock Holmes'.<sup>100</sup> Clearly detective fiction contributes here to the public understanding of parasitologists as medical detectives. Articles elsewhere discussed Ross as 'the man who tracked down the malaria germ' with reference

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<sup>98</sup> Jon Thompson, *Fiction, Crime and Empire: Clues to Modernity and Postmodernism* (Chicago: University of Illinois Press, 1993) pp.74-76.

<sup>99</sup> London, LSHTM. RC. Ross/138/02-03. 'Pioneer of Tropical Medicine. Sir P. Manson's Great Work. An Empire Builder.' *The Times*, 10 April 1922.

<sup>100</sup> 'Pioneer of Tropical Medicine. Sir P. Manson's Great Work. An Empire Builder'.

to apprehending the 'criminal mosquito'.<sup>101</sup> The *News of the World* described Ross's malaria research as 'one of the greatest detective stories of modern times'.<sup>102</sup> The subtlety of this framing suggests an internalisation of the association between parasitologists and detective figures—an implicit understanding that pre-empts literary allusion.

The doctor as detective is an idea reinforced by the presence of both detectives who think like doctors and doctors who think like detectives in fiction. Dr Thorndyke's unique detective skills stem from his ability to retain the mind of the doctor:

"I am positively frizzling with curiosity to know what chain of circumstances has converted John Evelyn Thorndyke from a medical practitioner into a luminary of the law."

Thorndyke smiled indulgently.

"The fact is," said he, "that no such transformation has occurred. John Evelyn Thorndyke is still a medical practitioner."

"What, in a wig and gown!" I exclaimed.

"Yes, a mere sheep in wolf's clothing."<sup>103</sup>

Meanwhile, Paul Gilchrist in 'The Adventures of a Man of Science, IV—The Sleeping Sickness' is a doctor who is able to think like a detective and thus connect the medical facts to motive, opportunity, and suspect profile, and so find Alma

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<sup>101</sup> London, LSHTM. RC. Ross/156/119-159. 'The Man Who Tracked Down the Malaria Germ' *John O' London's Weekly* 21 May 1921.

<sup>102</sup> London, LSHTM. RC. Ross/156/153. [no title], *News of the World*. 23 Oct 1921.

<sup>103</sup> R. Austen Freeman, *The Red Thumb Mark* (1909; Charleston: Bibliobazaar, 2007) p.14.

Ramsey's real killer. Upon seeing a patient with sleeping sickness, he excitedly inquires about the colour of the patient's eyes, meaning to identify his suspect from an earlier profile. His colleague, Dr Materick, replies 'with a smile', apparently amused at Gilchrist's attempt to play at detective; 'he knew me of old' explains Gilchrist, 'and had often spoken of my impetuosity in taking up clues which I supposed might help my friends out of difficulties.'<sup>104</sup> Both Thorndyke and Gilchrist are successful owing to the methodological similarities between their professions. Notably Gilchrist is successful in this case because he has expert knowledge—'I had studied Eastern diseases with care'—and even a corroboratory specialist in Dr Materick.

Gilchrist succeeds in solving the murder by reimagining apparently damning evidence, including a calling card supposedly left by the accused, and an eyewitness account that placed the accused at the crime scene. Unable to believe that his friend was capable of committing such a crime, he looks to gather more information, interviewing Lidderdale and discovering that he possessed a nearly exact doppelgänger. Believing the doppelgänger to be at fault, Gilchrist attempts to prove his friend's innocence by incriminating his double. Lidderdale's doppelgänger—a man by the name of Colville—had travelled to Africa with Lidderdale, but then continued west into the Congo Free State. If only there were a way to prove that someone with that exact travel history had committed the murder. The quotation at the beginning of the section details Gilchrist discovering that this proof was indeed within his grasp. Colville's blood is tainted with *filaria* parasites, which denote his past geographical associations with a tropical space

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<sup>104</sup> L. T. Meade and Clifford Halifax, 'The Adventures of a Man of Science, IV - The Sleeping Sickness', p.412.

in a literalisation of the aphorism: you can take the man out of [the Tropics], but not [the Tropics] out of the man:

The blood [...] contained a large quantity of the remarkable parasite, *filaria perstans*. As this parasite has never been contracted anywhere except on the West Coast of Africa, this fact proved at a glance that it was not the blood of Mrs. Colhurst. It must therefore follow, as a natural consequence, that it could only come from a person who had been in West Africa (411).

Gilchrist subsequently, and fortuitously, comes across a patient with sleeping sickness in London (who turns out to be the killer) when visiting a 'Harley Street doctor who was celebrated for his treatment of Eastern disease' (411). The specialist, a 'Dr. Materick', is perhaps a loosely veiled reference to Dr. Patrick Manson, who championed a connection between *filaria perstans* and sleeping sickness in the 1890s.<sup>105</sup> The story, written by a children's writer, Elizabeth Thomasina Meade Smith, and a doctor, Edgar Beaumont, under the pseudonyms of L. T. Meade and Clifford Halifax M.D., was published in the *Strand* magazine in 1896. Part of a series called 'The Adventures of a Man of Science', which recounted 'real life cases' narrated by fictional colleague Paul Gilchrist, the story articulates a dialogue between research in parasitology—the connection to *F. perstans* was still a theory, not a proven connection—and the British literary imagination. The racial profiling that we have seen in Henry Seton Merriman's *With Edged Tools* (published just two years earlier), and in newspaper articles

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<sup>105</sup> Manson discovered *F. perstans* in the blood of a West African patient suffering from sleeping sickness in 1890, and proposed a connection between the parasite and the disease, which was later disproven by the Royal Society Sleeping Sickness Commission of 1902.

reporting on the two cases of sleeping sickness at London Hospitals in 1890 and 1898, is completely absent from Meade and Halifax's short story. Although Dr. Materick admits that the disease is 'a sufficiently peculiar one for a European to have,' he does not seem unduly surprised by its presentment (412). Gilchrist theorises that Colville might have contracted the disease 'on his way down the Congo while living among the natives,' notably failing to outline its transmission method beyond being exposed to the same environment and habits as the native people—implied by the phrase 'living among' (411). This depiction of its ability to infest Britons as well as Africans re-characterises the disease; it is no longer the racially specific moral judgement depicted in *With Edged Tools*, but a geographically distinctive marker for criminal activity.

The association between sleeping sickness and crime is common to both narratives and centres on the lexis of morality. In *With Edged Tools* sleeping sickness is used as a somatic judgement and metaphorically categorises Africa as a place of contagion and disorder. The relationship between crime and parasitic disease in detective fiction is similarly concerned with personal and national identity. In such stories, the identity of the patient, victim, or murderer is bound up with the contraction of parasitic disease and its geographical overtones. When associated with the murderer, these geographical overtones have implications for the preservation of British nationhood, metaphorically undermined by the imposition of a threat from 'the East'.<sup>106</sup> Although Colville is British and undoubtedly dishonest before going to Africa—he slanders rival beau Lidderdale to their mutual love object (and later Colville's victim) Alma Ramsay while still in

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<sup>106</sup> Africa and India are often generalised in these stories to the 'East' and set up in contradistinction to the Western world.



England—it is arguably the sleeping sickness (and by extension Africa) that ultimately spurs Colville to kill. During his confession he relates his stabbing of Alma, 'in a fit of frenzy'. He then excuses his behaviour with reference to the effects of the onset of sleeping sickness: 'the moment I did the deed I repented. I ran to a decanter, which contained brandy and poured out a glass—I was ill at the time—I had been queer for days and weeks' (414). Here sleeping sickness is indirectly related to his crime, which thus locates the threat to the British nation as originating in the tropics. Moreover, Dr Materick's specialism, and Gilchrist's interest, in 'Eastern diseases' semantically excludes Colville's affliction, and therefore crime, from a Western or British frame of reference. The 'irritability' metaphor, discussed in the previous section, which contains the dual threat of somatic and moral degeneration, is likewise applicable here, placing criminal activity, a visit to the tropics, and the contraction of disease, within the same—foreign—field of reference.

In *Alien Nation: Nineteenth-Century Gothic Fictions and English Nationality*, Cannon Schmitt discusses the construction of English nationality in Gothic fiction, arguing that Englishness in these novels is engaged in a discursive relationship with Otherness, that 'Continental Europe, the East, or South America [provide] an antithesis against which Englishness might be elaborated'.<sup>107</sup> He uses a Holmes story published in 1924—'The Adventure of the Sussex Vampire'—to demonstrate this process at work, identifying the opposition between England on the one hand, and foreignness and the supernatural on the other, as tropes common to the Gothic at large. Indeed much of the detective and imperial fiction

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<sup>107</sup> Cannon Schmitt, *Alien Nation: Nineteenth-Century Gothic Fictions and English Nationality* (Philadelphia: University of Pennsylvania Press, 1997) p.3.

discussed in this thesis might be characterised as Gothic and are certainly subject to similar antithetical relationships. The Brahmin chiromancer in 'The Adventures of a Man of Science' contributes to the pairing of foreignness and the supernatural. Schmitt argues that the Gothic is chiefly concerned with national and individual identity, that the threat of invasion in these texts jeopardises the already fragile concept of Englishness, itself constructed as a negative imprint of the 'un-English' spaces of Continental Europe, South America, and the Far East. Such 'comparative and negative definitions of English selfhood' proliferated as the Empire facilitated greater contact with, and subjugation of, foreign peoples (14).

In the texts I analyse in this thesis these negative constructions of Englishness are set against the colonial spaces of India and Africa, against their people and pathologies. Schmitt argues that the orientalism that Edward Said recognises in western discourse provides 'a common ground for all western nations, a supra-national, monolithic "Occident" defined against an equally supra-national "Orient"' (141). This supra-national Orient is evident in the synecdochic treatment of Africa and sleeping sickness in 'The Adventures of a Man of Science - VI' as 'the East' and 'Eastern disease'. This use of 'the East' to refer to British colonies in India and Africa, as well as their diseases, is prevalent in much of the fiction I analyse in this thesis and demonstrates the generalisation of colonial spaces. These spaces are united in fiction by their foreign pathologies, which are presented as synonymous with these non-British, non-Western landscapes. Despite advancements in parasitology that identified the specific causative agents of parasitic disease and their complex transmission strategies, the 'tropical'

identifier of parasitic disease remained its defining characteristic, which, in many instances, served to pathologise the colonial encounter in ways that strengthened the power dynamics between the medical West and the medicalised East. Many novelists recognised and experimented with the universal antithesis between mankind and nature, however the East was still designated as the battleground for this fight. Thus terminology like 'eastern disease' is more than just a geographical signifier; it is an appellation that distances these diseases and their associated landscapes from western frames of reference and serves to strengthen, by contrast, British national identity—itsself built upon the strength of British medical authority. Later detective fiction challenges this dichotomy by presenting the tripartite relationship between crime, disease, and tropical space, as a framework invoked by criminals in a bid to derail the detective—a device that consciously acknowledges the enduring, and problematic, conflation of these frames of reference.

### **The Fin de Siècle Detective and 20-20 Scientific Vision**

R. Austen Freeman's novel, *The Mystery of 31 New Inn* (1912), like 'The Adventures of a Man of Science, IV—The Sleeping Sickness', is also concerned with sleeping sickness, but this time the disease is associated with the concealment of a crime. The story involves the murder of a man by morphine poisoning and an elaborate ruse designed to disguise the death as due to natural causes. Any other detective story might have had the reader believing in the sleeping sickness diagnosis right up until the inevitable dénouement, but Freeman's realistic style and adherence to 'common probabilities', rather than

'cheap melodrama',<sup>108</sup> quickly dispenses with the sleeping sickness diagnosis. Pioneer of the inverted detective story, Freeman provides his readership with a complete account of the crime as it happens, as well as the surrounding evidence, giving them ample opportunity to solve the mystery before his fictional detective. Thus he quickly disabuses the reader of the sleeping sickness possibility by having Dr. Jervis outline the discrepancy that alerts him to a diagnosis of intermittent poisoning:

For he had lied, beyond all doubt. His statement as to the almost continuous stupor was absolutely irreconcilable with his other statement as to the patient's wilfulness and obstinacy and even more irreconcilable with the deep and comparatively fresh marks of the spectacles on the patient's nose. That man had certainly worn spectacles within twenty-four hours, which he would hardly have done if he had been in a state bordering on coma.<sup>109</sup>

Mr Graves fails to present the comatose state of the late-stage sleeping sickness patient, instead exhibiting an intermittent 'wilfulness' that seems incongruous with such a diagnosis. However, Dr Jervis admits that he has little knowledge of the disease and even that its symptoms 'were absolutely unknown' to him. It seems odd then that he writes off the suggestion so quickly and goes with his first, instantaneous—and correct—diagnosis of morphine poisoning, an astuteness that enacts the implicit strength of the British medical gaze. Given its

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<sup>108</sup> See: 'The Mystery of 31 New Inn' *The Bookman* 43(1912)255 p.190.

<sup>109</sup> R. Austin Freeman, *The Mystery of 31 New Inn* (1912; Charleston: Bibliobazaar, 2006) p.29.

relatively minor role in the story, it is surprising that Freeman chose sleeping sickness, when any debilitating disease would certainly have done the same job. Sleeping sickness does, however, have the dual attribute of being both mysterious and fatal, making it a suitable disease to cover up a murder. When German suspect Mr Weiss suggests the disease to him, Jervis is 'startled', admitting that sleeping sickness '[was] nothing more than a name to [him]' (25). In his suggestion of sleeping sickness, Mr Weiss attempts to locate the threat to Mr Graves—and by extension British society—in the British colonies, invoking all of the moral, social, and epidemiological discourses associated with tropical spaces. However, this threat is really situated within Europe (in the form of Mr Weiss himself)—a threat that is foreshadowed by Britain's impending war with Germany. Erskine Childers' immensely popular book *The Riddle of the Sands* (1903) had depicted imperial Germany as just such a threat nine years earlier.

The inclusion of sleeping sickness in this story, in addition to invoking the politics of imperial space, serves to reinforce British national and scientific authority. In their success, Thorndyke and Jervis demonstrate the specialised deductive abilities of the British detective, and by extension, the medical authority of British scientists. Freeman places the case in the past in order to frame the disease in more obscure terms and has Jervis point out that, at the time of the case, 'practically nothing was known about the disease. It was a mere pathological curiosity, almost unheard of excepting by a few practitioners in remote parts of Africa, and hardly referred to in the text-books' (25). Jervis admits that he knows nothing about it, owing to his lack of need to know: 'I have never practised outside of England and have had no occasion to study it,' thus

marking it as an imperial, rather than domestic problem. However, Mr Weiss seems well acquainted with the disease, and in response to Jervis's rather vague question: 'Has Mr. Graves been abroad?' he supplies fundamental circumstantial evidence in favour of the diagnosis: 'I know [Graves] spent some time recently in West Africa, where this disease occurs' (25). This interchange, rather than diverting Jervis's attention to a rogue diagnosis, serves to deepen the suspicion he has of Mr Weiss. The cover-up fails because it is perhaps too improbable; Thorndyke notes 'the probabilities are against sleeping sickness [...] common sense of the matter is therefore that we adopt morphine poisoning as our working diagnosis [...] For medical purposes you adopted the more probable view and dismissed the less probable' (35). The apparent 'probability' of the poisoning diagnosis relies on the presence of one symptom: contraction of the pupils, which is not associated with sleeping sickness, but is associated with morphine poisoning. Jervis's recognition of this symptom and his empirical treatment of the case—'[we must consider] the evidence apart from our opinions on the subject'—endows him, and his companion Thorndyke, with exacting, scientific gazes.

Logical reasoning prevails in Freeman's detective fiction, a genre that he argues is 'in effect, an argument conducted under the guise of fiction'.<sup>110</sup> His archetypal Thorndyke even exhibits medical insight regarding sleeping sickness by following his rule of logic:

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<sup>110</sup> R. Austin Freeman, 'The Art of Detective Fiction' (1924) reprinted on *Gaslight*. (Calgary: Mount Royal College, 2004) <<http://gaslight.mtroyal.ca/detcritF.htm>> [accessed 19 March 2016].

From what I know of the disease, its symptoms agree with those in your case in respect of the alleged moroseness and in the gradually increasing periods of lethargy alternating with periods of apparent recovery. On the other hand, the disease is said to be confined to Negros, but that probably means only that Negroes alone have hitherto been exposed to the conditions that produce it (35).

Despite his lack of knowledge and experience with the disease, Thorndyke surmises that its apparent racial bias is probably only circumstantial. Freeman is writing with the benefit of hindsight in this case, set before, but written after, the elucidation of its aetiology and transmission pathway. Thorndyke's supposition thus appears to a contemporaneous readership to be further evidence of his scientific authority. Freeman undoubtedly took inspiration from his first hand experiences, having spent some years in West Africa as a colonial surgeon. He returned to London in 1891, after suffering from black-water fever (a complication of malaria) and published *Travels and Life in Ashanti and Jaman* in 1898, which contained a chapter on malaria advised upon by Sir Patrick Manson. At the time of his travels, Freeman was assistant colonial surgeon and (perhaps significantly) the Anglo-German boundary commissioner of the Gold Coast, and in the introduction places himself in the position of the 'scientific traveller' or 'anthropologist'.<sup>111</sup> During these travels it is likely he would have encountered the disease that inspired part of the plot for his 1912 detective novel.

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<sup>111</sup> R. Austin Freeman, *Travels and Life in Ashanti and Jaman* (Westminster: Archibald Constable and Co, 1898) p.xvii.

Freeman first tried it out in short story form as '31 New Inn' in 1905—the first Thorndyke story he wrote—and adapted it into a full novel six years later. The short story differs in some minor details, but retains the sleeping sickness plot line. Murderer Mr. Weiss was originally Mr. Morgan, and neither he nor his accomplice were German. In the final novel, the crime takes a more sinister turn when Weiss's accomplice, Mrs. Schallibaum attempts to kill Jervis to prevent the crime from being revealed. In the short story the conversations about sleeping sickness were more understated and the victim's alleged travel to Africa less well established; when Jervis asks if the patient—now masquerading as Morgan's brother—has been to Africa, Morgan simply notes that 'he has just come from New York, but where he was before going there I have no idea.'<sup>112</sup> However, significantly, the sleeping sickness/poisoning diagnostic pairing remains, representing the same periphery-metropole dichotomy.

The bulk of the tale actually revolves around a legal problem concerning the details and wording of a will. Thorndyke is asked to consult on the case, owing, not to his legal abilities, but to his ability to 'view things from a radically different standpoint and [bring] a new and totally different kind of knowledge into the case'—a knowledge, which lawyer Mr. Marchmont describes as 'a positive encyclopaedia of [the] out-of-the-way and unexpected' kind. This admission strikingly parallels young Stamford's description of Holmes in *A Study in Scarlet*: 'he has amassed a lot of out-of-the-way knowledge'.<sup>113</sup> This description is again propounded in a later story when Holmes himself admits: 'I hold a vast store of

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<sup>112</sup> R. Austin Freeman, '31 New Inn' *Dr Thorndyke's Complete Short Story Collection* (Winnetka: Book Revivals Press, 2013). e-book. (Chapter 2).

<sup>113</sup> Doyle, 'A Study in Scarlet', p.15.



out-of-the-way knowledge'.<sup>114</sup> In addition to his eclectic knowledge base and his empirical mind—uniquely suited to problem solving—Thorndyke possesses a laboratory in his chambers and embarks on a number of scientific experiments with the help of lab assistant and butler, Polton.

One of these experiments is a tracking technique carried out by Jervis to find the house of the victim, which he had only visited under secretive circumstances, having been previously conveyed in a modified hansom cab with no windows. Thorndyke teaches Jervis a system to 'map' his blind journey, accompanied by a modified wooden board with compass attached. This 'experiment' is one, as Freeman proudly tells us in the preface to the novel, that he devised and carried out himself during his time in West Africa. The track chart and route map produced from the process were used to map Ashanti and the surrounding region and were subsequently published by the Royal Geographical Society, compiled into a map by the intelligence branch of the War Office, and accompanied his *Travels in Ashanti and Jaman* (1898). Freeman thus uses a technique for mapping the far interior of Africa to cartographically illuminate the English capital. This practical connection between the colonies and the metropole is accompanied by many thematic encroachments on London by the 'East'—not least the suggestion of sleeping sickness, but also the numerous references to the 'East' that litter the text.

The victim is an Oriental scholar with a pension from the Foreign Office, one of the clues is a brush used for drawing Chinese characters, and when Mrs Schallibaum tries to poison Jervis she drops Oriental beadwork. These references

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<sup>114</sup> Arthur Conan Doyle, 'The Lion's Mane' *The Complete Stories of Sherlock Holmes* (1926; Ware: Wordsworth Editions, 2008) pp.1360-73. (p.1368).

play little significance in the elucidation of the mystery and have no apparent significance for the crime itself, which is committed for inheritance money, bequeathed to the victim by his aunt. Thus their presence in the story situates the crime within a colonial framework that does not exist, and diverts our attention to politics that appear to bear no relation to the situation at hand. These references then, functioning as part of background and character description, rather than as elements of plot, reflect the fusion of colonial and British cultures and highlight the entanglement of understandings of imperial and British nationhood. This is something that Ross Forman discusses in relation to the nineteenth-century understanding of 'Greater Britain'. In his *China and the Victorian Imagination* (2013), Forman highlights the significance of China as the 'missing piece in the imperial jigsaw', arguing for the interlinking of formal and informal empire.<sup>115</sup> He identifies China as a 'sounding board for a variety of broader imperial concerns'—a sentiment that, although beyond the scope of this thesis, could have interesting implications for the frameworks at play in this story, especially given the politics behind the German antagonists' attempts to project anxiety outwards towards the colonies.<sup>116</sup>

By removing its urban landmarks and feigning the introduction of a tropical disease to its populace, the criminal, through the invocation of imperial frameworks, threatens to obscure the physical and social landscape of London—a threat that embodies Upamanyu Pablo Mukherjee's assertion that 'British

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<sup>115</sup> Ross G. Forman, *China and the Victorian Imagination: Empires Entwined* (Cambridge: Cambridge University Press, 2013) p.12.

<sup>116</sup> Forman, p.13. Indeed, 'The Adventure of the Dying Detective', which I will discuss in the next section of this chapter, also contains oblique references to Chineseness, in this case as a way of demarcating a colonial threat to, or contamination of, British subjects.

imperialism was a source of profound anxiety for English national identity'.<sup>117</sup> Mukherjee identifies, in Doyle's depiction of Holmes and his metropolitan London, a metonymic relationship between Englishness and British imperialism that conceives national identity as inseparable from imperial identity. This metonymic treatment of identity is acknowledged in *The Mystery of 31 New Inn*, in which the antagonist plays on these imperial anxieties about English national identity to divert the detective's attention away from the threat posed by himself, a European. However, at the same time, the cartographic interventions used by Thorndyke and Jervis and the Oriental objects throughout the narrative, help the detectives solve the crime. In this way, Freeman presents a more complicated relationship between England and her colonies, in which he uses the idea that Britain's encounters with imperial space threaten the integrity of the English social (and somatic) body, in order to demonstrate that in reality these encounters also provide Britons with the tools to neutralise threats posed by other European powers.

The threats to British nationhood posed by these European powers are expressed through the trope of deceit, while the ability to unmask this deceit is expressed through the prominence of visual technologies—a motif intimately bound up with empire. Weiss and his accomplice's criminal activities involve crimes of deception: fraudulent signatures, disguise, and impersonation, in addition to murder. When Jervis enters their world, London is transformed into an unmapped blank—the journey he is taken on deliberately obscures his own

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<sup>117</sup> Upamanyu Pablo Mukherjee, "Out-of-the-Way Asiatic Disease': Contagion, Malingering and Sherlock's England' in *Literature of an Independent England: Revisions of England, Englishness, and English Literature* eds. Michael Gardiner and Claire Westall (Basingstoke: Palgrave Macmillan, 2013) pp.77-104. (p.82).

neighbourhood by zigzagging and doubling back on already travelled streets. This defamiliarisation occurs in the absence of Jervis's sight, and he must then recreate London using his other senses. Thus the story explores the complexities of the visual gaze, which is, although Thorndyke and Jervis's greatest hermeneutic asset, constantly being challenged. The visual gaze pervades the novel as a motif that frames the discovery of truth. Thorndyke utilises the amplifying abilities of the microscope's gaze to produce enlarged copies of some cheques using a camera that offers apparent objectivity—thereby allowing him to identify the fraudulent signature. The accomplice's abnormal gaze, a divergent squint, is what alerts Jervis to her identity, and subsequently prevents him from drinking the poison that she had slipped into his afternoon tea. Mr. Weiss's disguise is, in part, rumbled by his peculiar spectacles made of watch glass, and Jeffery Blackmore is identified as Mr. Graves by virtue of his own unique prescription of spectacles, made to account for a tremulous iris. The emphasis on visual authenticity—common to detective fiction as a genre, in the form of clues or evidence and in the scientific detective's unique ways of seeing—is again in dialogue with the research scientist, and particularly the scientific pathologist, who relied on the microscope to identify disease.

In 1900, the *Journal of the Society of Arts* published a lecture, given by Ross, which couched pathological medicine in these visual terms, arguing that the children of Science are 'born blind' and highlighting the revolutionary insight that came with the birth of experimental medicine:

The last born and perhaps the greatest of all—the science of pathology—was still almost sightless; and we ascribed diseases without the smallest experimental proof, to all kinds of causes, such as humours, chills, miasmas and telluric, and even heavenly influences. The latter half of the century, which is now behind us—the wonderful researches of Pasteur, Lister, Laveran, Koch and many others scarcely less meritorious—has opened the world's eyes in this respect. Pathology has become an experimental science. We now keep diseases labelled in our laboratories; we measure them; we examine them under the microscope [...] we prevent great outbreaks and save the lives of thousands.<sup>118</sup>

The *Indian Medical Gazette* in 1898 similarly lauded the importance of the microscope, this time in relation to soldiers traveling home and infecting others with the germs of tropical dysentery. The article recommended that returning soldiers should be confined to hospitals and kept there 'as long as the microscope shows them capable of being a source of infection to others'.<sup>119</sup> The microscope in both these articles provides a kind of sight that is denied to the ordinary person, understood as an objective truth only achievable by rendering the invisible visible. An advertisement for Bausch and Lomb Optical Company in 1920 took part in this same discourse. With the cry 'Man's Ancient Enemies, Invisible No More!' the company discussed the significance of the microscope in the 'crusade against disease'.<sup>120</sup> 'Invisible, they were also invincible', it argued,

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<sup>118</sup> 'Malaria and Mosquitoes' *Journal of Society of Arts*. 30 Nov 1900, pp.18-26. (p.18).

<sup>119</sup> 'Infection of Healthy Areas by Diseased Troops' *Indian Medical Gazette*. 33(1898)12, p.463.

<sup>120</sup> 'Man's Ancient Enemies, Invisible No More!' *The World's Work Advertisers Miscellaneous*, 1920. n.p.

'but once discovered and identified, science devised safeguards against infection, and commenced its patient cataloguing of these, man's ancient enemies'. Detective fiction too takes part in the cataloguing of enemies using visual technologies, which in actuality, or by analogy, resemble the relationship between the microscopist and his pathological subjects. In *The Mystery of 31 New Inn*, it is the combined effect of this enhanced visual gaze, Thorndyke's knowledge of Oriental culture, and his intuitions about tropical disease that ultimately enable the detectives to solve the crime and restore the status quo. This methodology parallels the parastologist's microscope and his knowledge of what were considered to be predominantly colonial diseases.

In the preface to *John Thorndyke's Cases*, Freeman notes that his stories 'illustrate [...] the application to the detection of crime of the ordinary methods of scientific research'.<sup>121</sup> This application is methodological: Thorndyke is a stickler for empirical evidence and for experimental *a priori* deduction; literal: he regularly uses microscope work in solving his crimes (work that Freeman boasts to have 'in all cases been performed by [himself]');<sup>122</sup> and analogical: Thorndyke's scrutinising scientific gaze parallels the microscope, both of which render the invisible visible (in Thorndyke's case by making 'visible' the real killers and solving the mystery). Doyle takes an almost identical attitude in the Holmes stories, and his application of science to crime too relies on the use of optical technologies. Having himself specialised in ophthalmology, it is no surprise that Doyle appreciated the significance of the science of vision to the detection of truth. In *A Study in Scarlet* Watson is bemused to observe Holmes

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<sup>121</sup> R. Austin Freeman, *John Thorndyke's Cases: A Collection of Dr. Thorndyke Mysteries* (Charleston: Bibliobazaar, 2006) n.p. (preface).

<sup>122</sup> Freeman, *John Thorndyke's Cases*, (preface).

inspect a crime scene with a magnifying glass and glean apparently new information:

As he spoke, he whipped a tape measure and a large round magnifying glass from his pocket. With these two implements he trotted noiselessly about the room, sometimes stopping, occasionally kneeling, and once lying flat upon his face [...] Finally, he examined with his glass the word upon the wall, going over every letter of it with the most minute exactness. This done, he appeared to be satisfied, for he replaced his tape and his glass in his pocket (31-32).

Holmes scouring a room with his magnifying glass is a scene repeated often throughout the canon, a visual amplification that always furnishes Holmes with additional information and a deductive edge.<sup>123</sup> 'The Adventure of Shoscombe Old Place' begins with Holmes bending over a microscope and proclaiming the solution of a case. He tells Watson that he has been asked to consult on the case by Scotland Yard owing to the fact that, through Holmes, they 'have begun to realise the importance of the microscope'.<sup>124</sup> This, of course, heralds the rise of forensic science. However, it is not just the increasing use of empirical evidence and scientific technique that Doyle and Freeman advocate, but an empirical mind-set that supports the exploration of hypotheses in dialogue with the evidence present: "A man of science," replied Thorndyke, "expects nothing. He

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<sup>123</sup> For an overview of Holmes's use of his lens, see: James O'Brien, *The Scientific Sherlock Holmes: Cracking the Case with Science and Forensics* (Oxford: Oxford University Press, 2013).

<sup>124</sup> Arthur Conan Doyle, 'Shoscombe Old Place', *The Complete Stories of Sherlock Holmes* (1927; Ware: Wordsworth Editions, 2008) pp.1383-96. (p.1383).

collects facts and keeps an open mind [...] When I have accumulated a few facts, I arrange them and reason from them. It is a capital error to decide beforehand what data are to be sought for".<sup>125</sup> Holmes similarly declares: 'it is a capital mistake to theorise before you have all the evidence. It biases the judgment'.<sup>126</sup> Ironically, the scientific methods and practices that the detective figure models himself on were not always upheld by the scientists themselves. The 'capital' mistake, which Freeman and Doyle, through their mouthpieces, outline is one that plagued parasitology research; Manson's assumptions concerning mosquitoes and their life cycles led him to dismiss the theory of transmission via biting, opting instead for a contamination of water, owing to the fact that he thought they died shortly after laying eggs.<sup>127</sup> He thought that malaria was transmitted in a 'hereditary way from mother mosquito to sons and daughters as a cell parasite' and that it was then transmitted to man via contaminated water.<sup>128</sup> Ross initially conducted his research along these lines, carrying out experiments with artificial marshes and attempting to produce infection by contaminating water with dried infected mosquitoes. Another false assumption was that sleeping sickness and trypanosomiasis were different diseases, and not, as they are in reality, different stages of the same disease.<sup>129</sup> The failure of parasitologists to adhere to the empirical methodologies outlined by Doyle and Freeman exposes the scientific-detective as an embodiment of the ideal scientific

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<sup>125</sup> Freeman, *The Mystery of 31 New Inn*, p.96.

<sup>126</sup> Doyle, 'A Study in Scarlet', p.27.

<sup>127</sup> J. W. W. Stephens, 'Manson, Sir Patrick (1844–1922)', rev. Mary P. Sutphen, *Oxford Dictionary of National Biography*, (Oxford: Oxford University Press, 2004) online edn, January 2008 <<http://www.oxforddnb.com/view/article/34865>> [accessed 21 March 2016].

<sup>128</sup> Patrick Manson, Letter 13 02/005. *The Beast in the Mosquito*, pp.36-38. (p.36).

<sup>129</sup> A connection made by David Bruce in 1903. Gordon. C. Cook, *Tropical Medicine: An Illustrated History of the Pioneers* (London: Elsevier, 2007) pp.153-54. Also see Appendix 1.



researcher, a mythic idol allied with Ross's 'knight of science', both of which served as emblems of British imperial strength.

### **Holmes, the Tropics, and Criminal Intent**

Many of Doyle's Holmes stories reflect an interest in tropical disease. *The Sign of Four* (1890) includes an allusion to malaria, which interestingly pre-empted Ross's proof of the mosquito vector in 1897 (Jonathan Small complains of his lot in a 'fever ridden swamp' 'bitten by mosquitoes, racked with ague');<sup>130</sup> *The Adventure of the Yellow Face* (1893) and *The Hound of the Baskervilles* (1902) see references to yellow fever; and *The Valley of Fear* (1914) and *A Study in Scarlet* (1887) both mention typhoid. Doyle himself spent time as a physician in South Africa during the Anglo-Boer War, as well as being a ship's doctor aboard a steamer to West Africa in 1881, where he would have undoubtedly encountered tropical disease. He gave an introductory address to medical students at St Mary's Hospital in 1910 wherein he mentioned tropical pathologists Manson, Ross, and David Bruce as examples of men who had greatly benefitted mankind.<sup>131</sup> In the same address, Doyle argued that 'in every transaction in the world, you are likely to find medical facts at the root of it, influencing its origin and growth',<sup>132</sup> a sentiment that demonstrates his awareness of the significance of medicine as a politicised discipline and hermeneutic tool. The connection

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<sup>130</sup> Arthur Conan Doyle, 'The Sign of the Four' *The Complete Stories of Sherlock Holmes* (1890; Ware: Wordsworth Editions, 2008) pp.97-174. (p.159).

<sup>131</sup> Arthur Conan Doyle, 'The Romance of Medicine' *St Mary's Hospital Gazette* 16(1919) pp.100-06 qtd by William A. Sodeman, 'Sherlock Holmes and Tropical Medicine: A Centennial Review' *American Journal of Tropical Medicine and Hygiene* 50(1994)1 pp.99-101.

<sup>132</sup> Arthur Conan Doyle, 'The Romance of Medicine' *St Mary's Hospital Gazette* 16(1919) pp.100-06 qtd in 'The Romance of Medicine' *British Journal of Nursing* 45(1910) p.326.

between medicine and empire is embodied in the character of Dr Watson; his experiences of empire frame the very first Holmes story and create links that solidify nationhood as an enduring theme. Having trained at Netley, Watson became an assistant surgeon for the Indian regiment and was sent immediately to Afghanistan during the second Anglo-Afghan War. During the campaign he was shot in the shoulder and sent to a base hospital in Peshawar; however, here he contracted enteric fever (typhoid)—'that curse of our Indian possessions'<sup>133</sup>—and, after a long recovery, was sent back to England. It is due to this that he meets Sherlock Holmes. His contraction of a tropical disease, typhoid, is what ultimately sends him home—too weak to continue life in the tropics—and what ultimately underpins their investigative partnership.

'The Adventure of the Blanched Soldier' (1926) and 'The Adventure of the Dying Detective' (1913) are two Holmes stories that explore the political overtones of tropical disease in more detail. In 'The Adventure of the Blanched Soldier', one of the few stories narrated by Holmes, Mr James M Dodd enlists Holmes to solve the mystery of his missing comrade, Godfrey Emsworth, who fought beside him in the Anglo-Boer war and had since ceased all communication. He is certain Godfrey's father, Colonel Emsworth, is keeping him in an outbuilding against his will. After some minor inquiries, Holmes concludes that Godfrey has contracted leprosy, which he notes 'is not uncommon in South Africa'.<sup>134</sup> The dénouement has Godfrey relay his story. In a wounded state, suffering from severe exhaustion, Godfrey stumbled upon an apparently empty building near Pretoria and collapsed into one of the many unmade beds. Upon

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<sup>133</sup>Doyle, 'A Study in Scarlet' p.13.

<sup>134</sup> Arthur Conan Doyle, 'The Blanched Soldier' *The Complete Stories of Sherlock Holmes* (1926; Ware: Wordsworth Editions, 2008) pp.1254-69. (p.1268).

waking he found himself in a leper hospital and having been patched up by the medical superintendent, made his way back to England where he began to develop the symptoms of leprosy. His parents confined him to the outbuilding with an attendant surgeon to prevent him from being removed to a leper hospital and segregated for life.

Holmes asks the surgeon, a Mr Kent, if he is an authority on such diseases, 'which are [...] tropical, or semi-tropical in their nature'. The surgeon admits that he is not a specialist, somewhat defensively explaining that he has the 'ordinary knowledge of the educated medical man' (1267). The framing of leprosy as a tropical disease is a contentious subject. Rod Edmond notes that in Manson's seminal textbook *Tropical Diseases* (1900), he included leprosy, describing it as 'an important element in the pathology of nearly all warm countries',<sup>135</sup> despite it having no specific geographical or climatic associations with them.<sup>136</sup> Prevalent in tropical countries, but by no means confined to them, Edmond argues that Manson's choice to include leprosy as a tropical complaint is partly informed by ideas about civilisation and represents 'an attempt to put a fence around Europe' and protect it from the tropical world.<sup>137</sup> Manson admits that lepers exist in Australia, the United States, Canada, and Iceland, but insists that his designation is justified—that although not being caused by them, leprosy is associated with 'social conditions' like 'uncleanly habits, squalor, dirt, and poverty', which he clearly situates in the colonial environment (418). This might account for Holmes's definition of the disease and Dodd's bizarre description of

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<sup>135</sup> Patrick Manson, *Tropical Diseases: A Manual of the Diseases of Warm Climates*, p.417.

<sup>136</sup> Cutaneous leishmaniasis or Oriental Sore a tropical disease caused by a protozoan parasite was often called 'white leprosy' owing to its characteristic lesions. This perhaps serves to strengthen the claims of western medicine for leprosy as a tropical aesthetic.

<sup>137</sup> Rod Edmond, 'Returning Fears: Tropical Disease and the Metropolis', p.184.

Godfrey's 'slinking' guilt (having been tainted by his encounter with the colonial world). Indeed, Godfrey's encounter with leprosy is framed by environmental cues; he is prompted into the building by 'a deadly, sickening sort of cold, very different from a crisp, healthy frost', and awakes to the 'African sun' flooding through the windows.

Godfrey's story also gestures to debates in tropical medicine concerning leprosy's transmission, which was variously believed to be via water, food, air, direct contact, or insect bites. The medical superintendent believes himself to be immune, but still informs Godfrey that he would never have done what he did: 'you are in far greater danger here than ever you were on the battlefield [...] you have slept in a leper's bed' (1266). The emphasis on his sleeping in the bed echoes research at the turn of the century that made a case for transmission via bed bugs. Bishop of Lebombo W. R. Smyth noted that the tribes in his diocese had only sporadic cases of leprosy; they ate and drank together, but 'no healthy person ever sle[pt] with a leper.' He explained that married couples, of which one is leprous, still had intercourse, 'but always in the daytime'.<sup>138</sup> This, he concluded, pointed to *Cimex lectularius* (the bedbug) or some wingless parasite as the chief cause of transmission. Another article in the *British Medical Journal* (1906) also cited sharing a bed as a transmission method: 'A man, aged 39, became infected with leprosy through sleeping in the same bed with his leprous brother'.<sup>139</sup> The sharing of a bed supports vector-based transmission, as well as transmission via nasal droplets. The superintendent's insistence that Godfrey is

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<sup>138</sup> W. R. Smyth, 'Leprosy' *British Medical Journal* 2(1906)2397, p.1670.

<sup>139</sup> 'Recovery from Leprosy' *British Medical Journal* 2(1906)2376, p.5.

in 'far greater danger' than on the battlefield articulates the perceived deadliness of tropical disease.

Holmes calls for a second opinion, bringing with him a renowned dermatologist, Sir James Saunders. Doyle supports a hierarchical relationship between the general practitioner and the specialist—particularly the specialist with a leaning toward 'tropical' aetiologies—in his description of the doctor's reaction to this intervention: 'The prospect of an interview with Lord Roberts would not have excited greater wonder and pleasure in a raw subaltern than was now reflected upon the face of Mr. Kent' (1267). This military comparison further situates tropical disease in dialogue with British imperialism. The specialist as Lord Roberts is particularly significant, owing to Lord Robert's position as Commander-in-Chief of the Forces and his involvement in the Indian Rebellion, the Second Anglo-Afghan War, and the Anglo-Boer War.<sup>140</sup> The characterisation of Mr Kent's 'wonder' at specialist medical knowledge, embodied by Saunders, constructs a medical hierarchy, which, through analogy, not only lionises specialisation, but moreover suggests that this specialisation represents the kind of authority figure that furthers British national dominance.

Saunders is able to absolve Godfrey of his fate by re-diagnosing his complaint as 'pseudo-leprosy' or 'itchthyosis', a curable skin disease that merely resembles the symptoms of leprosy. He speculates that Godfrey's complaint is psychosomatic, owing to the mental trauma that he had been through, illustrating the devastating impact of colonial conflict of the returning British body. Even the threat of exposure is almost enough to compromise Godfrey's

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<sup>140</sup> Brian Robson, 'Roberts, Frederick Sleight, First Earl Roberts (1832–1914)' *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004) online edn, January 2011. <<http://www.oxforddnb.com/view/article/35768>> [accessed 21 March 2016].

somatic identity and future freedom, however, Doyle's medical specialist uses his expertise to reinterpret Godfrey's condition, and in doing so, like Ross's emblematic 'knight of science', strengthens the boundaries between British and colonial space. Like Merriman and Masefield, Doyle conflates the moral and physical 'pathologies' of the tropical world by depicting Godfrey's disease as psychosomatic, and furthermore, demonstrates that the dangers of the colonial encounter might be neutralised by British medical authority. While the Dutch at the Leper hospital in Pretoria have been transformed into 'strange monstrosities', Godfrey is able to retain his somatic identity, but only after it has been sanctioned by Holmes and his English medical specialist, Sir James Saunders.

The utility of tropical disease as a signifier for other social and imperial anxieties is apparent in much of the fiction I analyse in this thesis. Here tropical disease codifies the social backwardness that Manson sees in colonial spaces—leprosy signifying more broadly the social dangers that lie in the 'tropical or semi-tropical' environment. However, in addition to this, tropical disease becomes associated with crime, especially fraudulent crime. The confluences between the disruption wrought by both crime and disease are here emphasised. Disease in these fictions either facilitates or else highlights criminal activity, functioning as more than merely literary devices, but rather as signifiers of the dangers of imperial spaces. This signification is itself problematised; in these stories, criminals pedal the narrative of 'imperial danger' in an attempt to mask the real threat that they themselves pose to British society. Tropical diseases function as motifs of misdirection that are eventually debunked by

scientific detectives with specialist knowledge, who duly apprehend the criminal and restore the integrity of the social body. We have seen just this pattern in Freeman's *The Mystery of 31 New Inn*, whereby the epidemiological assumptions about these diseases and their transmission pathways are employed to mask the crime being committed. The power of the detective to restore the status quo by apprehending the criminal, mirrors the protective powers of the scientist in an understanding of empire framed by medical knowledge. The detective's reliance on such knowledge highlights the significant lens that medicine provided for understanding the imperial encounter.

In Doyle's 'The Adventure of the Dying Detective' (1913), tropical disease is responsible for a similar misdirection. However, in this case, the misdirection both masks the crime and helps to solve it. In this story, Holmes emulates the symptoms of a tropical disease in order to ensnare Mr. Culverton Smith, a man who had used the disease to murder his nephew. Holmes tells Watson, 'there are many problems of disease, many strange pathological possibilities, in the East.'<sup>141</sup> This categorises 'Eastern' spaces as mysterious and pathogenic. The tropical nature of this disease—'a coolie disease from Sumatra'—is what makes it both a suitable cover-up for a murder and a suitable object for the practice of malingering. Little is known about the disease, except that it is 'infallibly deadly' and 'horribly contagious' (1170)—attributes that make it prime subject matter for the specialist. Holmes rejects Watson's help with the explanation, 'you are only a general practitioner with very limited experience and mediocre qualifications' (1171), a cutting remark that gestures toward a hierarchical

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<sup>141</sup> Arthur Conan Doyle, 'The Dying Detective' *The Complete Stories of Sherlock Holmes* (1913; Ware: Wordsworth Editions, 2008) pp.1169-81. (p.1171). Here again 'the East' is used as a euphemism for otherness, for the unknown and unrecognised.

medical framework—one that Manson and Ross would also endorse in their efforts to legitimise parasitology as a worthy and nationally significant specialism. However, Holmes's specialist, who turns out to be the murderer, is not a medical man, but a planter.

His direct experiences with the disease, following an outbreak on his plantation, are what impel him to commit the crime and what furnish him with 'special knowledge'. Thus the colonial space might be characterised as both degenerative (arguably precipitating Smith's immoral scheme) and potentially regenerative, providing—as both Holmes and Smith point out—the optimal conditions for the study of disease. The 'far reaching consequence' of Smith's study of disease, however, is not the production of a cure and the protection of Britain's imperial assets, but the murder of a British citizen in the heart of the Empire for financial gain. His nephew's death causes the estate to revert to Smith. Mukherjee argues that this story is an example of the way in which Doyle's detective fiction 'dramatise[s] a particular set of anxieties about decay, contamination, or [the] dilution of 'Englishness' in the era of the British world empire' and identifies the 'language of tropical medicine, disease, and detection' as the framework within which this takes place.<sup>142</sup> This contamination or dilution is located, for Mukherjee, in the physical dramatisation of tropical invalidism—Smith is 'small and frail, twisted in the shoulders and back'—and in the malingering of Holmes himself, who embodies both the faking of illness by some English returnees, and the racialised 'laziness' attributed to colonial labourers.

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<sup>142</sup> Mukherjee, "Out-of-the-Way Asiatic Disease': Contagion, Malingering and Sherlock's England', p.80.



Thus, imagined and actual encounters with imperial space threaten to dilute 'Englishness', which is perceived—in line with the rhetoric of palliative imperialism—as moral, civilised, and healthy. Smith's 'great yellow face' might suggest either the jaundice of chronic illness, or, more likely, an imaginative indictment of his cultural 'contamination', which is framed also by his ill temper, menacing eyes, and a 'coquettish' velvet smoking cap perched on his bald head.<sup>143</sup> The morally degenerative impact of colonial spaces, which is, as we have seen, imaginatively paired with tropical pathology, appears to act on both Smith (who is impelled to murder) and, to a lesser extent, on Holmes (who is impelled to behave dishonestly). However, I argue that, unlike the fraudulently invalidated returnees or colonial stereotypes that Mukherjee identifies as models for his behaviour, Holmes's malingering is really a productive form of 'work' with an unselfish motive. By carrying out his act with 'the thoroughness of a true artist', including starving himself for three days, Holmes is able to inhabit the mind-set of the patient and fool the murderer. Not only does he protect British society from further attacks by Smith, he also removes him from the affluent social position that Mukherjee reads as embodied in his property, with its 'smug respectability' and Kensington address.

Smith observes: '[It was] very surprising that he should have contracted an out-of-the-way Asiatic disease in the heart of London', an unlikeliness that attracts Holmes's attention and spurs the investigation (1178). The geographical overtones that accompanied tropical disease ensure that Holmes finds the presence of the disease in London suspicious. Of course there are logical

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<sup>143</sup> Given that the smoking cap's traditional function was to protect the hair from smoke, Smith's donning of it on his 'high bald head' appears to be purely aesthetic, a further indictment of his cultural contamination.

explanations for the transmission of such disease across geographical space, like that which he supplies to Watson, when he convinces him of having caught the disease by working among Chinese sailors down by the docks. This alludes to the transmission of tropical disease by traders, who were often taken to the Albert Dock Seaman's Hospital in Greenwich, where the London School of Tropical Medicine was established in 1899.<sup>144</sup> We can infer from Watson's remark: 'in the second year of my married life', that the story is set around 1890 (Watson married Mary Morstan in 1889) and so before the London School was established. However, Doyle perhaps alludes to, father of tropical medicine, Patrick Manson, who was appointed as a physician at the Albert Dock Hospital in 1892, when Watson notes that 'Dr Ainstree, the greatest living authority upon tropical disease, is now in London' (1171). Indeed Holmes's cover story involving Chinese sailors might be a further oblique reference to Manson, whose seminal discovery of the mosquito vector for filariasis was made during his time in Amoy, China. Thus Watson clearly too recognises the authority of the specialist.

Holmes speaks of the disease in ambiguous terms, simply terming it 'a coolie disease' and locating it on a plantation in Sumatra. To demonstrate Watson's 'ignorance' of tropical medicine, he asks him: 'what do you know, pray, of Tapanuli fever? What do you know of the black Formosa corruption?' (1170-71). Watson replies that he has not heard of either. It is unclear whether these questions concern the tropical disease in question or are simply examples of

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<sup>144</sup> Cook and Webb argue that the Albert Dock Hospital became a 'nidus for the clinical component of the newly established discipline, tropical medicine'. G. C. Cook and A. J. Webb, 'The Albert Dock Hospital, London: the original site (in 1899) of Tropical Medicine as a New Discipline' *Acta Tropica* 79(2001)3. pp.249-55. (p.253).

other tropical diseases to demonstrate the lacuna in Watson's medical knowledge. Scholars have, however, attempted to identify Doyle's fictional disease based on these clues. William Sodeman argues that Tapanuli fever might have been based on melioidosis, an infectious disease first reported by pathologist Alfred Whitmore in Burma in 1912, the year before the publication of Doyle's story.<sup>145</sup> N. Joel Ehrenkranz suggests primary septicaemic plague; pandemic plague swept Southeast Asia, including Sumatra and Formosa (now Taiwan), in the 1890s (accounting for the reference to 'the black Formosa corruption').<sup>146</sup> These scholars cite modern examples with similar transmission routes to uphold the authenticity of their claims—the first a case of melioidosis transmitted by a thorn in Thailand,<sup>147</sup> and the second, a court trial wherein a man murdered another by jabbing him in the arm with a sharp object contaminated with *Yersinia pestis*, the bacterium responsible for plague, in India.<sup>148</sup> The fact that these scholars have presented such different candidates for the disease suggests that Doyle did not have a specific disease in mind, but rather wanted to depict a generalised or ambiguous portrayal of tropical disease in order to draw attention to the politicised relationship between the imperial metropole and its periphery.

Smith, a planter with experience of the disease, pits himself against Holmes, noting:

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<sup>145</sup> See: William A. Sodeman, 'Sherlock Holmes and Tropical Medicine: A Centennial Review' *American Journal of Tropical Medicine and Hygiene* 50(1994)1 pp.99-101.

<sup>146</sup> N. Joel Ehrenkranz, 'A. Conan Doyle, Sherlock Holmes, and Murder by Tropical Infection' *Reviews of Infectious Diseases* 9(1987)1 pp.222-25.

<sup>147</sup> See the original case: James. K. Torrens, Paul. H.M. McWhinney, and David.S. Tompkins, 'A Deadly Thorn: a case of imported melioidosis' *Lancet* 353(1999)9157 p.1016.

<sup>148</sup> See original case: L-T Wu, J.W.H Chun, R. Pollitzer, and Cy Wm. 'Some Remarkable Plague Cases' *Plague: A Manual for Medical and Public Health Workers*. Appendix I. (Shanghai: Mercury Press, 1936) pp.513-16.

"He is an amateur of crime, as I am of disease. For him the villain, for me the microbe. There are my prisons," [...] pointing to a row of bottles and jars which stood upon the side table. "Among these gelatine cultivations some of the very worst offenders in the world are now doing time" (1176).

The literal vilification of pathogens here is significant. Ross uses the same metaphors of crime in his research. In one of his notebooks, he compiled a list of causative agents of skin disease under the heading 'villain classification'.<sup>149</sup> The symbolic connections that both Ross and Doyle make between crime and pathology are made in the context of the cultural and medical discourses of criminal anthropology and degeneration. Italian criminologist Cesare Lombroso had famously connected criminality to biological atavism in his 1876 book *Criminal Man*, while Hungarian critic Max Nordau had framed the social and literary cultures of the fin de siècle as degenerate (a term he allied with criminality and moral insanity) using terms like 'symptoms', 'diagnoses' and 'etiology'.<sup>150</sup> A recent collection, *Disease and Crime: A History of Social Pathologies and the New Politics of Health* (2014) edited by Robert Peckham, investigates the pathologisation of crime and the criminalisation of pathology—a bidirectional dialogue that, according to Peckham, 'imbu[ed] politics with scientific authority [and] shap[ed] how science was produced and how scientists

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<sup>149</sup> London, LSHTM. RC. Ross/157. Undated Notebook.

<sup>150</sup> See: Max Nordau, *Degeneration* (London: William Heinemann, 1895).

viewed their work.<sup>151</sup> The discursive relationship between disease and crime can be read in the fiction I analyse in this chapter. The pathologisation of crime is depicted in 'The Adventures of a Man of Science IV—The Sleeping Sickness' and *The Mystery of 31 New Inn*, while the criminalisation of disease can be read in 'The Adventure of the Dying Detective'. Moreover, their pairing is represented by the methodological similarities between the doctor and the detective recognised at large by the detective genre in the late nineteenth century and embodied in the figure of the scientific detective.

### **Criminal Natives, Criminal Nature.**

In *Crime and Empire*, Mukherjee discusses the growth of widespread cultural representations of 'criminal' natives and explores the intricate relationships between crime and British imperial authority, a relationship perpetuated and problematised by crime fiction. Mukherjee argues that the discourses of criminality surrounding the native Indian, African, or Caribbean in English detective novels, worked to 'interrogate colonial ideology, but also outline[d] a critique of British domestic society.'<sup>152</sup> The criminal native is conspicuously absent from the detective stories considered in this thesis, replaced with a 'criminal' nature, or at least a nature, which, in tandem with its parasites, supports the existence of, at the same time as exposing, criminal activity. In this way the parasite becomes a new form of 'criminal native', which functions to

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<sup>151</sup> Robert Peckham, 'Introduction: Pathologizing Crime, Criminalising Disease' in *Disease and Crime: A History of Social Pathologies and the New Politics of Health* ed. Robert Peckham (London: Routledge, 2014) pp.1-20. (p.2).

<sup>152</sup> Upamanyu Pablo Mukherjee, *Crime and Empire: The Colony in Nineteenth Century Fictions of Crime* (Oxford: Oxford University Press, 2003) p.9.

emphasise the inherent dangers of colonial spaces. Parasitic disease arguably inspires murder in 'The Adventures of a Man of Science', at the same time as it helps to catch the killer; in *The Mystery of 31 New Inn* its unconvincingness as a cover story for murder draws attention to the crime; and in 'The Adventure of the Dying Detective' it acts as both a murder weapon and a methodology for entrapment. Parasitic disease and its colonial associations function in these fictions as frameworks that support British scientific authority, however in the process they draw attention to domestic criminality. The antagonists in these stories are British (or, in the case of *The Mystery of 31 New Inn*, European) but have a somatic or intellectual connection with the colonies. Thus the association of these disease aetiologies with crime draws attention to wider anxieties about the colonial encounter and interrogates the underlying assumptions upon which these anxieties are based.

A tripartite relationship between crime, tropical spaces, and disease is employed in H. P. Lovecraft's short story 'Winged Death' (1934). Although notably absent of a detective figure, the story does stage and resolve a crime, and supplies the reader with the 'evidence' at the beginning of the narration, thus encouraging attempts to 'solve' the mystery before the narration reveals its resolution. The narrative opens with four men: the hotel proprietor, a policeman, a coroner and his physician, standing in a hotel room in South Africa, 'furtively glancing' between the dead body in front of them, the journal in the physician's hand, a dead fly in a pot of ammonia, and some scrawled handwriting on the ceiling. The remaining narrative is taken directly from the journal, revealed to belong to the dead man, who is both the victim and perpetrator of a murder. As with earlier

stories like *With Edged Tools* (1894) and *Multitude and Solitude* (1909), 'Winged Death' cultivates a connection between Africa, disease, and mental deterioration—a relationship that medicalises the social threat posed by the British colonies by upholding a connection between contagion and aberrant behaviour. However, the characterisation of the protagonist refracts imperial anxiety back onto the metropole by virtue of his western identity, as well as his exploitation of the colonial flora and fauna to enact his own schemes of revenge, schemes that culminate in his own death.

The onset of sleeping sickness in all three novels is accompanied by mental deterioration and a loss of agency. This transformation is brought into particular focus in Lovecraft's story, wherein we witness the gradual mental breakdown of the narrator in a narrative that refuses to fully confirm or negate the teller's perspective. The story follows Dr. Thomas Slauenwite who, having been professionally slighted by scientific rival, Henry Moore, embarks on a complicated scheme for revenge involving the breeding of morphologically unique tsetse flies. After a number of experimental trials on his native servants, Slauenwite infects the cross-bred tsetses with *Trypanosoma* parasites and ships them anonymously to Moore in the hope that he, being an entomologist, will attempt to identify them and in the process contract sleeping sickness. However, during Slauenwite's experiments he learns of a native superstition that once bitten, 'the devil-fly [...] takes hold of [the victim's] soul and personality, if it is still alive itself, flying around with all his likes, dislikes, and consciousness'.<sup>153</sup> The idea, which he initially dismisses as native superstition, takes hold of Slauenwite

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<sup>153</sup> H. P. Lovecraft, 'Winged Death', n.p.

after he witnesses some strange behaviour from a tsetse fly following his native servant's death and hears of similar tsetse behaviour after the death of Moore.<sup>154</sup> Following the reported death of his rival from sleeping sickness, and mounting suspicion cast in his direction, Slauenwite flees to Johannesburg under an assumed identity. However, a few months after Moore's death, and three years after the first journal entry, Slauenwite takes to writing in it again, this time 'solely to relieve [his] mind'. Plagued by a tsetse fly, which seems to have its own agenda, Slauenwite records his encounters and voices apprehension inflected by the African superstition that it now contains his dead rival's consciousness. The diary entries become increasingly frantic as Slauenwite begins to question his own sanity:

Jan. 16—Am I going insane? [...]

Jan. 17—Either I am mad or the world is in the grip of some sudden suspension of the laws of probability, as we know them. [...]

Jan. 18—Into what strange hell of living nightmare am I plunged? [...]

Jan. 19—I am utterly engulfed in horror.<sup>155</sup>

Slauenwite's distrust of his own senses, the references to his 'shaken' mind, and even his handwriting—which, we are informed, becomes 'irregular, nervous and very difficult to decipher'—undermine the veracity of his perspective. Thus the ending, with its dead body and accompanying paraphernalia, can be interpreted in two ways: that the narrator has contracted sleeping sickness and the diary recounts his gradual mental deterioration as a result of the illness, or that he

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<sup>154</sup> In the first case the tsetse appears to commit suicide, in the second it "escapes" out the window with implied intent.

<sup>155</sup> H. P. Lovecraft, 'Winged Death' n.p.



really was being hounded by a supernatural arthropod, which eventually killed him. The cause of death is noted as 'heart-failure induced by sheer fright', but the coroner admits the presence of a tsetse fly bite, as well as the presence of trypanosomes in the blood, keeping both possibilities in play. The writing on the ceiling, however, supposedly written by Slauenwite in fly-form, appears to corroborate his story:

SEE MY JOURNAL—*IT* GOT ME FIRST—I DIED—THEN I SAW I WAS IN  
*IT*—THE BLACKS ARE RIGHT—STRANGE POWERS IN NATURE—NOW I  
WILL DROWN WHAT IS LEFT.

Thus the drowned fly in a pot of ammonia is purported to be Slauenwite's suicide, after he realised that his consciousness had been transferred into the fly's body. The coroner notes that the position of the writing is in a place 'no human hand could reach', which appears to again confirm the authenticity of the supernatural. It is ironic then that despite being infected with 'the deadliest bacilli in all Africa', it is merely the fear of the fly, which eventually kills him. The mysteries of Africa, articulated by native superstition, are pitted against, and supersede, the scientific authority of the West. The lethality of sleeping sickness is undermined by the lethality of superstition, and in the process the ethics of imperialism are subjected to scrutiny.

Although the focus of the story is Slauenwite's criminal intent with respect to Henry Moore (and his subsequent murder of him), he exhibits equally shocking behaviour in regard to his native assistants upon whom he

experiments without their knowledge or consent. He continually deceives them, abusing their trust in his bid to enact scientific revenge on a former colleague; 'I am playing on his gratitude' notes Slauenwite of Mevana, whom he persuades to return to a sleeping sickness saturated area once recovered. He even denies Batta, his house-boy, curative tryparsamide injections because he wants to know how long it takes to 'finish a case'. Batta suffers for three months before finally submitting to the disease, while Slauenwite injects him with saline. He boasts that 'the ignorance of the few men [there] makes it easy for [him] to conceal [his] aims', an admission that reveals a troubling hierarchy of knowledge pertinent to narratives of imperial authority. Indeed, Slauenwite associates 'white men' with knowledge and 'blacks' with superstition and naivety. This dichotomy is challenged by Slauenwite's revelation at the end of the story, when he admits that 'the blacks are right'.

The supernatural power of the African landscape—and by extension its pathologies—is reinforced by its association with already established Cthulu mythology. Slauenwite narrates his journey into the African jungle to look for sleeping sickness-infested tsetse flies as follows:

In one spot we came upon a trace of Cyclopean ruins, which made even the Gallas run past in a wide circle. They say these megaliths are older than man, and that they used to be a haunt or outpost of 'The Fishers from Outside'—whatever that means—and of the evil gods Tsadogwa and Clulu. To this day they are said to have a malign influence, and to be connected somehow with the devil-flies.

This admission connects the tsetse flies and sleeping sickness with an unknown African prehistory, giving credence to the native's superstition and their belief in powers beyond human understanding. The suggestion that Tsadogwa and Clulu (degenerations of the names 'Tsathoggua' and 'Cthulhu', cosmic alien deities from the Cthulhu mythos) are responsible for both malign influence (sleeping sickness) and devil-flies (tsetses) endows Africa with a further layer of obscurity by aligning its pathologies with an ancient, non-human agency.

The Cthulhu mythos—a shared fictional universe based on the work of H. P. Lovecraft, but expanded and embellished by his contemporaries—interacted with the newly emergent weird fiction genre in the early twentieth century, a genre, which S. T. Joshi argues did not exist widely as a self-conscious classificatory style, but rather as 'the consequence of a world view'.<sup>156</sup> This worldview, as Miéville notes when writing of Lovecraft's fiction, is underscored by a horror of modernity, which is 'above all horror of "inferior races", miscegenation and cultural decline'.<sup>157</sup> The anxieties of weird fiction expose its entanglement with competing discourses surrounding British Imperialism, evolutionary theory, and western acclimatisation to tropical environments. Lovecraft himself defines weird tales as tales that feature 'a certain atmosphere of breathless and unexplainable dread of outer, unknown forces [...] a malign and particular defeat of those fixed laws of Nature which are our only safeguard

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<sup>156</sup> S. T. Joshi, *The Weird Tale* (Holicong: Wildside Press, 1990) p.1.

<sup>157</sup> China Miéville, 'Weird Fiction' in *The Routledge Companion to Science Fiction* eds. Mark Bould, Andrew Butler, Adam Roberts and Sherryl Vint. (Abingdon: Routledge, 2009) p.513.

against the assaults of chaos'.<sup>158</sup> This fear of the other, and the inability of science to explain or defeat it, certainly fits the plot arc of 'Winged Death'. The inclusion of parasitic disease as a heuristic that undermines 'the fixed laws of Nature' is significant; weird tales like this one articulate an anxiety about the unknowability and uncontrollability of the Other (embodied by the Tropics and its pathologies)—an anxiety that is expressed by the imaginative triumph of the supernatural over western scientific knowledge.

This story, although written some thirty years after the formalisation of parasitology and the elucidation of sleeping sickness, expresses the same anxieties that were encoded in turn-of-the-century detective fiction, and dramatises, with the benefit of distance, the politicised discourse of the imperial encounter. Mukherjee identifies underlying frameworks similar to those that I have identified in these fictions, in his analysis of an anthology of Kipling's supernatural and gothic stories, including '[the crisis of] imperial bureaucracy and knowledge systems [...] the construction of a heroic English masculinity, and the permanent threat and paradoxical attraction of a tropical disaster zone'.<sup>159</sup> He argues that stories like 'The Phantom Rickshaw' (1890), which includes a representation of tropical disease and another posthumous diary, '[assert] the superior force of mystery over knowledge, disease over science and disaster over stability in everyday imperial life' (19). These are certainly aspects common to many of the texts dealing with tropical disease that I have analysed in this thesis, and appear to support Joshi's understanding of weird fiction (elsewhere understood as an hybridisation of supernatural, gothic, and science fiction), as an

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<sup>158</sup> H. P. Lovecraft, *Supernatural Horror in Literature* (1927) (Project Gutenberg, Australia, 2006) <<http://gutenberg.net.au/ebooks06/0601181h.html>> Ch.1. [accessed May 2015].

<sup>159</sup> Mukherjee, p.19.

articulation of a specific world view, or as Miéville terms it, a 'literature of crisis' (513). The stories I analyse identify tropical medicine and its politics as a platform for exploring and decoding such cultural and national crises. David Simmons, analysing Lovecraft's work and its dialogue with the Gothic tradition and the Abject, places Lovecraft alongside Bram Stoker and Joseph Conrad, as a writer who 'use[s] the non-Western as a signifier of horror.'<sup>160</sup> A signifier, which I argue, is underscored by tropical pathology.

At the fin de siècle, an identifiable network of white, male, (mostly) British writers produced fiction that, by incorporating tropical disease, took part in a specific rendering of nationhood, which relied on attributes integral to, or else written into, emergent scientific sub-disciplines. The importation into fiction of disciplinary politics alongside disciplinary science demonstrates the pervasiveness of tropical medicine in the cultural sphere, and the use of parasitic disease to explore domestic issues, such as crime, morality, personal identity, and scientific prowess, illustrates an awareness of the significance of imperial life and medicine to formulations of British selfhood.

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<sup>160</sup> David Simmons, "'A Certain Resemblance': Abject Hybridity in H. P. Lovecraft's Short Fiction' *New Critical Essays on H. P. Lovecraft* ed. David Simmons (New York: Palgrave Macmillan, 2013) pp.13-30. (p.14).

## 'A Strange World of Discs': the Characterisation of Parasites in Science and Literature.

In 1924 Ronald Ross received a letter from the Education Officer for the London County Council, G. H. Gater, asking him to give a lecture on bacteria as part of the 'Lectures for Teachers' scheme. Ross replied:

I would be willing to give a lecture, but unfortunately I am not a bacteriologist. The work for which I am known was done on minute animal parasites, which are not bacteria, and which are the cause of malaria—a tropical disease.<sup>1</sup>

This curt response demonstrates the divide between public and professional opinion. Gater, who had suggested a lecture entitled 'malaria and mosquitoes' and subsequently apologised for his 'unscientific treatment of [Ross's] subject',<sup>2</sup> evidently uses bacteria as a synecdoche for tropical medicine. Ross, however, fiercely defends the boundaries between his discipline—parasitology—and its intellectual rival—bacteriology. Both of these come under the purview of 'tropical medicine', but only one is legitimately 'tropical' in Ross's view, as evidenced by his addendum that malaria is 'a tropical disease'. This same process of differentiation is evident in Ross's application for a post at the new hospital for Indian wounded at Brighton. Upon receiving a letter from a friend encouraging him to apply for

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<sup>1</sup> London, LSHTM, RC. Ross/150/02/01-04. Ross to G. H. Gater, 19 May 1924.

<sup>2</sup> London, LSHTM, RC. Ross/150/02/01-04. Gater to Ross, 23 May 1924.

a post as 'consulting bacteriologist and pathologist', Ross wrote to the Secretary of State for India. However, he instead suggested titling the post: 'consulting physician in Tropical Diseases or Consulting pathologist with regard to protozoal and other animal parasites'. This modification implies again that tropical diseases for Ross consist mostly, or only, of 'protozoal and other animal parasites'.<sup>3</sup>

The bacteria/parasite distinction complicates the history of Tropical Medicine, with its proponents and the lay-press adopting different terminologies. In January 1913, the *Financial Times* published a review of a meeting at the Royal Colonial Institute, entitled 'Empire Leading Article: Imperial Bacteriology'. The article, as its title suggests, used 'tropical bacteriology' as a synonym for tropical medicine, speaking specifically about the diseases malaria (a protozoan disease) and yellow fever (a bacterial disease) under the same broad title. Despite the indiscriminate use of 'bacterial' and 'parasitic' in the lay-press, there was a concerted effort to partition them within medical circles, a partition that was often predicated on their respective contributions to progression in tropical medicine. In 1904, for example, the *British Medical Journal* published an article about the London School of Tropical Medicine, which, in recording the history of the school, defined tropical medicine as a discipline based solely on parasitology: '[The proponents of the school] had come to recognise that a scientific appreciation of tropical medicine depended upon the fact that the great causes of disease in the tropics were not due to bacteria, but protozoa and larger

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<sup>3</sup> London, LSHTM. RC. Ross/134/01. Ross to Secretary of State for India, 1 December 1914.

parasites.<sup>4</sup> Ross penned a similar article in 1914, in his post as Professor of Tropical Sanitation at the University of Liverpool, which argued for parasitology's unique claim over tropical medicine: 'the history of [tropical medicine's] origin has not always been correctly given. The movement really commenced with the work of old parasitologists, rather than with that of the bacteriologists'.<sup>5</sup> As early as 1894 Ernest Hart, editor of the *British Medical Journal*, had begun an article on the medical profession in India by stating that '[he] regard[ed] the study of tropical disease as being in great measure a study of tropical parasites'.<sup>6</sup> These articles demonstrate a clear effort to emphasise the distinctness of parasitology as a specialised discipline, and one separate from bacteriology—a distinction that Manson argued was predicated on not just biological, but methodological differences:

Ten chances to one if one asks a student, or even a medical practitioner, to set about examining a patient for filariae, he will prepare a very fine film of blood, just as would be suitable for the demonstration of bacteria [...] with a twelfth of an inch immersion lens and an Abbe condenser [...however] filariae should be sought with an inch objective, otherwise they will be missed.<sup>7</sup>

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<sup>4</sup> 'London School of Tropical Medicine' *British Medical Journal* 2(1904)2285 p.1019.

<sup>5</sup> Ronald Ross, 'Tropical Medicine - A Crisis' *British Medical Journal* 1(1914)2771 pp.319-20. (p.319).

<sup>6</sup> Ernest Hart, 'An Address on the Medical Profession in India, its Position and its Work, delivered before the Indian Medical Congress held at Calcutta December, 1894.' *British Medical Journal* 2(1894)1774, pp.1469-74. (p.1469).

<sup>7</sup> Patrick Manson, 'The Necessity for Special Education in Tropical Medicine' *British Medical Journal* 2(1897)1919 pp.985-89. (p.986).



The methodology of the bacteriologist is useless here, exemplifying the difference between parasitic and bacterial microorganisms. Manson used this methodological difference to argue his case for the necessity of specialised training in tropical diseases. However, it was a distinction that was often lost on the popular press. Parasitologists' efforts to erect and maintain this distinction are reflected in and strengthened by fictional renderings of the tropical specialist (embodied also in the scientific detective), who was depicted with a superior skill set and a methodological finesse.

In Chapter Two I explored the efforts of parasitologists to 'brand' their discipline as a science integral to the furthering of the British Empire, owing to its inherently tropical concerns—a move that worked to legitimise their specialty in the eyes of the public and government officials alike. This bid for legitimisation, however, relied on the perceived uniqueness of training in tropical medicine and its ability to navigate territory inaccessible to the ordinary medical practitioner. In order to secure the necessity of a whole school dedicated to the study of tropical medicine, parasitologists needed to ensure it did not duplicate existing medical syllabi, and they did this, as John Farley argues, by excluding bacteriology from their professional identity.<sup>8</sup> Both the Liverpool and London schools excluded bacteriology from their established lectureships, a move that validated parasitology's claim to tropical medicine by implying that regular medical courses offering special training in bacteriology did not adequately prepare physicians for work in the tropics. As Farley notes: 'helminthology [...] protozoology [and] medical entomology,

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<sup>8</sup> John Farley, 'Parasites and the Germ Theory of Disease' *Framing Disease: Studies in Cultural History* eds. Charles E. Rosenberg and Janet Golden (New Brunswick: Rutgers University Press, 1992) pp.33-49. (p.44).

[which together make up parasitology] became synonymous with a new postgraduate medical field of study—tropical medicine' (43).

In his essay on parasites and germ theory, Farley charts the divergence of bacteriology and parasitology, arguing that the repeated resistance to accepting a generalised parasitic theory of disease in the 1880s and '90s negatively impacted research on bacterial diseases like yellow fever and plague (41). Manson's discovery of the mosquito vector for filariasis, research into the vector transmission of malaria, and Robert Koch's discovery of the bacterial causes of cholera, tuberculosis, and anthrax, contributed to the production of two distinct understandings of microorganisms—bacteria: usually contagious and transmitted passively, and parasites: non-contagious and actively transmitted, involving a vector or intermediate host (41). These schematics supported the characterisation of parasites as active, animal organisms associated with vector transmission.

The increasing awareness of the importance of vectors, and their particular associations with tropical pathologies, led to anxieties concerning the role of insects in disease transmission. This drew attention to the relationship between parasite, vector, and host. These motifs began to feature in late-century fiction and science alike as a reality of the tropical environment, a metaphor for the legislation of science, and a model to express social anxieties. In this chapter I will explore the dialogue surrounding the parasite-vector-host relationship, paying particular attention to the ways in which these organisms were characterised, and the consequences this characterisation had for the understanding of the relationship between humans and the natural world. I will

explore the personification of parasites by scientists and authors, in dialogue with their centrality to debates concerning scientific authority, and seek to demonstrate their efficacy as frameworks for professional and political satire. Using parasitologists' treatises on parasite life cycles and H. G. Wells' 1898 novel *The War of the Worlds* for critical comparison, I will analyse the battleground rhetoric that accompanied microorganisms in the late nineteenth century and identify the nuances of this discourse in relation to protozoan parasites. Finally, I will explore the motif of the parasite-vector-host relationship in Bram Stoker's *Dracula* and Sheridan Le Fanu's *Carmilla*, arguing that the vampire archetype becomes, in the late century, a powerful metaphor for expressing anxiety concerning tropical diseases and their transmission routes.

### **"Our Little Malaria Pets": Personifying Parasites and the Rhetoric of Active Transmission**

If the reader is not like the miserable professor, who, when asked if he was investigating the influenza germ, replied wheezily, "No, the influenza germ is investigating me" if in short the reader himself has not got "a go of fever" he may be interested to hear that enthusiasts consider the malaria germs more than engaging—quite beautiful in fact.<sup>9</sup>

Ross's 1895 piece in the *Pioneer* articulates, in its jocularity, a real tension in the representation of the microorganism at the fin de siècle. The late nineteenth century saw the discovery of a plethora of pathogenic microorganisms: those of

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<sup>9</sup> Ronald Ross, 'Malaria and the Mosquito' *Pioneer*, Sat 3 Aug 1895, p.3.

leprosy in 1879, of typhoid fever and malaria in 1880, of tuberculosis in 1882, of cholera, diphtheria, and tetanus in 1884, of influenza in 1892, of bubonic plague in 1894, of dysentery in 1900.<sup>10</sup> With them came a renewed fascination with the aesthetic appearance and biological power of the microscopic world. As I established in chapter one, the developments in microscopy in the eighteenth century facilitated the observation of pathological microorganisms, anxiety concerning which would resonate poignantly in the middle of the nineteenth century with the consolidation of helminthology, bacteriology, and later parasitology, as scientific disciplines. Discourses concerning the identification of new, minute organisms, and the connection of these organisms to pathology, negotiated fraught terrain between scientific fascination and visceral horror. In the 1880s, Nobel Prize winning Spanish neurologist Santiago Ramon y Cajal wrote a collection of short stories (published in 1900), which demonstrated this negotiation through its concern with man's relationship to the microscopic world.<sup>11</sup> In 'For a Secret Offence, Secret Revenge' a bacteriologist enacts microbiological revenge on his adulterous wife by infecting her lover with bovine tuberculosis, while in 'The Corrected Pessimist' a young doctor is given eyes capable of viewing the world as if through a microscope, and is delighted and disgusted in equal measure. The subject matter for these stories demonstrates the interest in these organisms and the imaginative potential that they represented, evoking wider ethical and ontological debates. Indeed, these formed part of a developing genre of short stories that involved microorganisms and

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<sup>10</sup> William Thomas Stead ed., 'The Conquest of Disease' *Review of Reviews* 42(1910)251 pp.459-60. (p.459).

<sup>11</sup> See: Santiago Ramon y Cajal, *Vacation Stories: Five Science Fiction Tales* trans. Laura Otis (1900; Champaign: University of Illinois Press, 2001).

dealt with the ethics and politics of scientific investigation, as well as the threat posed to humanity by creatures variously considered scientific curiosities or legitimate biological saboteurs.

H. G. Wells's 1895 short story 'The Stolen Bacillus', which deals with a misguided attempt at bioterrorism, is another example of this emergent genre. Upon looking down a microscope, the unnamed visitor to a bacteriologist remarks (of the Cholera bacillus): 'Not so very much to see after all. Little streaks and shreds of pink. And yet those little particles, those mere atomies, might multiply and devastate a city! Wonderful!'<sup>12</sup> The deadliness of these bacteria are made more poignant by their small size. The bacteriologist brandishes a phial of 'bottled cholera' (198), in a bid to impress his visitor, who is possessed by its fatal and infiltrative ability:

[D]eath—mysterious, untraceable death, death swift and terrible, death full of pain and indignity [...] take[s] the husband from the wife, here the child from its mother, here the statesman from his duty, and here the toiler from his trouble. He would follow the water mains, creeping along the streets [...] creeping into the wells [...] getting washed into salad, and lying dormant in ices [...] he would soak into the soil, to reappear in springs and wells at a thousand unexpected places (198-99).

The horror of the microscopic world here lies partly in its 'untraceable' nature, and partly in its ability to infiltrate all levels of society. Wells's story highlights the

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<sup>12</sup> H. G. Wells, 'The Stolen Bacillus' (1895) *Literature and Science in the Nineteenth Century: An Anthology* ed. Laura Otis. (Oxford: Oxford University Press, 2009) p.197.

materiality of the bacillus and its relationship to man: able to be collected and housed as a biological curiosity, but also stolen and released as an agent of death. The materiality and collectability of pathological organisms was alluded to in Doyle's 'The Dying Detective' (discussed in the previous chapter) and by Ross in a lecture given at the Society of Arts in 1900. In this lecture, he discussed the scientist's ability to keep diseases in bottles, 'so that we can hold them in our hands and look at them.'<sup>13</sup> He himself brandished a vial of 'some of the deadly fevers of the west African marshes' however, in this case, he explained, the disease was not in the form of mist, as miasmatic theory would have argued, but in the bodies of insects preserved in formalin. This articulates a renegotiation of previous visual associations of disease transmission, represented symbolically by mist, and the emergence of a new associative paradigm that implicated an arthropod vector.

The association between insects and disease added an important new dimension to pathology that is absent from more environment-based theories: that of active transmission, and with active transmission came the lexicon of blame. The actions of the insect vector were often subject to personification (and conceived as a personal vendetta on the part of the insect), which was perceived as biting 'with intent'—an idea that formed the basis of H. P. Lovecraft's 'Winged Death' (1934) and was explored in John Masefield's *Multitude and Solitude* (1909). In a fit of fever, Roger, of *Multitude and Solitude*, is overcome by a harrowing hallucination, which anthropomorphises the trypanosome parasite and its tsetse fly vector, and articulates the disturbing nature of active transmission:

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<sup>13</sup> London, LSHTM. RC. Ross/70/28. Lecture given at The Society of Arts and published in *Journal of Society of Arts*, 30 Nov 1900, pp.18-26.

He began to see an endless army of artillery going over a pass. The men were all dark; the guns were all painted black; the horses were black [...] instantly they changed to tsetses, riding on dying cattle. They were giant tsetses, with eyes like cannon-balls. An infernal host of trypanosomes wriggled around them. The trypanosomes were wriggling all over him. A giant tsetse was forcing his mouth open with a hairy bill, so that the trypanosomes might wriggle down his throat. A flattened trypanosome, tasting as flabby as jelly, was worming over his lips.<sup>14</sup>

The vivid act of force-feeding, accompanied by the military framing of the hallucination, offers a strikingly violent representation of vector transmission. The implied malice of the tsetse flies, and the visceral disgust evoked by the descriptions of the trypanosome parasites, portray the transmission of parasitic disease as a traumatic experience. A trauma that is, at least partly, exacerbated by the vector's own ruthlessness.

Like the surprise voiced by the visitor in 'The Stolen Bacillus' at the meagre appearance of the cholera bacillus, Roger later ruminates on the underwhelming appearance of the trypanosome:

Very anxiously, after preparing the slide for observation, he focussed the lens, and looked down into the new, unsuspected world, bustling below him on the glass. He was looking down on a strange world of discs, among

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<sup>14</sup> John Masefield, *Multitude and Solitude* (London: Grant Richards, 1909) pp.195-96.

which little wriggling wavy membranes, something like the tails of tadpoles, waved themselves slowly, and lashed out with a sort of whiplash snout. Each had a dark little nucleus in his middle, and a minute spot near the anterior end [...] He watched them for a minute or two horrified by the bluntness and lowness of the organism, and by its blind power. It was a trembling membrane a thousandth part of an inch long. It had brought Lionel down to that restless body on the bed. [...] It was the visible pestilence, the living seed of death, sown in the blood (245).

The 'lowness' of the organism only draws attention to its 'blind power' and makes the bodily impact of the parasite all the more horrifying. This apparent discrepancy between its size and its potency is redressed by Roger's fevered brain by producing a hallucination that radically amplifies both vector and parasite. Indeed, the visual identity of parasites was a significant point of contention, stemming from their characterisation as variously: diminutive, beautiful, or morphologically simple. While scientists described their life cycles within the host and mused on the significance of their aesthetic appearances, novelists reimagined them in ways that helped reflect their potency. This imaginative potency is reflected, for example, in Bram Stoker's conflation, as I will argue later in this chapter, of malaria with vampirism. Additionally, authors voiced the anxiety surrounding active transmission: Lovecraft does this by attributing a supernatural malice to the tsetse, and Stoker by pairing the arthropod vector with an archetype from folklore. Both, significantly, use the realm of the supernatural to endow their antagonists with greater power.



The materiality of the malaria parasite caused considerable controversy in the late nineteenth century allied to its position as erythrocytic, something reflected in the prominence of blood imagery in fictions of invasion. The emergence of a visual culture concerning microorganisms, bolstered by parasitologists' attempts to intellectually privilege their discipline, did much to secure the place of the parasite in the public imagination as a natural adversary to man. As I will argue, by aligning parasites with animals and associating them with high profile diseases, parasitologists contributed to a reconsideration of humans, their behaviour, and their relationship to other organisms. The jostling for authority between competing researchers and theorists was largely predicated upon visual interpretation. The erroneous identification of the malaria 'bacillus' by Edwin Klebs and Corrado Tommasi-Crudeli in 1879, called the pathological significance of Laveran's bodies (*Plasmodium* parasites), which were identified the following year, into question. Ross himself penned an article in 1893 in opposition to what he called 'Laveranism', an opposition that he would later use as qualification to convert others to the 'plasmodium gospel'.<sup>15</sup> In the article, he wrote that it was 'extremely improbable' that any Indian fevers were due to blood parasites or bacteria, or any *specific* infection,<sup>16</sup> rejecting both Laveran's, and Klebs and Tommasi-Crudeli's theories.<sup>17</sup> He suggested, like many others, that the malaria parasite was in fact a degenerated red blood cell or the nuclei of a leucocyte, or some other microscopy viewing error. He doubted its connection to

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<sup>15</sup> London, LSHTM. RC. Ross/39/15. Cutting: 'The Malaria Parasite and its Critics' from the *Indian Medical Gazette* (1898)

<sup>16</sup> i.e. not due to a single species of microorganism.

<sup>17</sup> Ronald Ross, 'Some Objections to the Haematozoic Theories of Malaria' *The Medical Reporter*, 1 March 1893, pp.65-68.

malaria, citing the plethora of microorganisms found in the blood and in drinking water as a reality that precluded any case for one microorganism over another.

Mary Kingsley humorously outlined the confusion over the causative agent of malaria in her *Travels in West Africa* (1897) when she asserted: '[In recent years] when the peculiar microbes of everything from measles to miracles were being "isolated", several bacteriologists isolated the malarial microbe, only unfortunately they did not all isolate the same one.'<sup>18</sup> She even appeared to support Ross's claim for a non-specific cause for malaria, arguing that malaria 'as far as [she has] seen or read of it seems to be, not so much one distinct form of fever, as a group of fevers—a genus, not a species' (681). By 1895, however, Ross had changed sides and was now a proponent of the malaria parasite, describing its life cycle for the readers of *The Spectator* and insisting that their presence in the blood as a cause of malaria was 'now an old tale, known for about fifteen years'.<sup>19</sup> This radical change of stance was partly a result of Ross's improved microscope training, which had enabled him to perceive, with his own eyes, the parasites so famously championed by Laveran and others as the cause of malaria. However, it was more likely influenced by his newfound friendships with scientists like Laveran and Manson, who ascribed to the plasmodium theory. As Laura Otis argues in *Membranes*, microscopy was not an objective experience, and what scientists saw at the end of a microscope was influenced by their own preconceptions.<sup>20</sup> Ross's new loyalty to the cause, along with the subjectivity of visualisation, is expressed in his response to a correspondent of the *Pioneer* in

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<sup>18</sup> Mary Kingsley, *Travels in West Africa: Congo Francais, Corisco and Cameroons* (London: Macmillan, 1897) p.681.

<sup>19</sup> Ronald Ross, 'Malaria and the Mosquito' *The Pioneer* Sat 3 Aug 1895 p.3.

<sup>20</sup> Laura Otis, *Membranes: Metaphors of Invasion in Nineteenth-Century Literature, Culture and Politics* (Baltimore: Johns Hopkins University Press, 1999) particularly, pp.1-9.

1897, known only as SCEPTIC, who doubted the authenticity of the malaria parasite:

Any attempt to prove that the malaria parasite is not a degenerate red corpuscle is like an attempt to prove that the moon is not made of green cheese; most of us, I believe, are pretty confident that our satellite is not composed of that substance, but I fancy it would be somewhat difficult to prove the point, especially in the limits of a letter to the Daily Press, against a person obstinately possessed of the green cheese theory.<sup>21</sup>

### **Parasites versus Bacteria: the Animal-Vegetable Divide**

Pasteur's germ theory encouraged pathologists to identify the specific causes of disease as due to microorganisms. This provided a model that encouraged the classification of organisms by their pathogenic qualities, a catch-all term that included bacteria, parasites, fungi, and later, viruses. However, within scientific and medical spheres there were attempts to provide distinction between these microbiological organisms, reflected in the often self-imposed identities of specialists. The terminology surrounding disease in this period was diverse and conflicting, particularly in relation to the two highest profile pathogenic organisms: bacteria and parasites. The defining characteristic of protozoan and helminthic organisms—their parasitic life-style—was not unique enough to maintain their difference from bacteria, with some scientists, as Michael Worboys notes, referring to bacteria also as parasitic and including bacteria as smaller

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<sup>21</sup> Ronald Ross, 'The Cause of Malaria' *Pioneer*, 5 June 1897, p.8.

parasites in discussions of parasitic disease.<sup>22</sup> Worboys in *Spreading Germs* argues that in the 1870s and 80s germ theories of disease were increasingly being associated with the 'bacterial theory of disease' despite the persistent belief that these microorganisms were 'saprophytic or parasitic' (154). This confusing and inconsistent use of terminology blurred the boundaries between these two types of organisms and their transmission routes. That said, Worboys admits that 'it was against the paradigm of parasitic diseases that [English physiologist Henry Charles Bastian] found Pasteurian germ theory wanting' (93), suggesting a recognition of the real morphological and aetiological differences between parasites and bacteria.

This discourse was complicated by the fact that all intracellular pathogenic organisms are by definition 'parasitic', whether 'true' parasites or not. Thus, parasitic organisms were increasingly described—by parasitologists—as morphologically, rather than behaviourally distinct from bacteria. Farley argues that a generalised parasitic theory of disease did not emerge in the nineteenth century.<sup>23</sup> However, in fiction there is an identifiable trend for representing disease in general as behaviourally parasitic, a motif I explore in H. G Wells's *The War of the Worlds* (1898) and Bram Stoker's *Dracula* (1897). The efforts to distinguish bacteria and parasites as separate pathological organisms, which positioned protozoan and helminthic parasites taxonomically closer to animals

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<sup>22</sup> Michael Worboys, *Spreading Germs*, p.212.

<sup>23</sup> John Farley, 'Parasites and the Germ Theory of Disease' *Framing Disease: Studies in Cultural History* eds. Charles E. Rosenberg and Janet Golden. (New Brunswick: Rutgers University Press, 1992) pp.33-49. (p.41).

than bacteria,<sup>24</sup> also had a lasting impact on these literary disease motifs. The high profile debates concerning parasitic diseases and their transmission routes furnished novelists with a paradigm from which to explore concepts of contagion, imperialism, and identity, a paradigm that was bolstered by the parasite's conscious association with human culture and even sentience.

In an 1898 article discussing his increasing disbelief in 'the harmlessness of parasites, whether animal or vegetable', Surgeon-Major Giles highlighted the dichotomy between bacteria and protozoa.<sup>25</sup> By demarcating them as 'animal' or 'vegetable', parasitologists, whilst accepting the parasitic nature of bacteria, strove to erect boundaries between them and 'true' parasites. As Ross notes of the malaria protozoa in 1895,

They are none of your vulgar vegetable bacteria [...] they are animals and not vegetables; and instead of presenting such a common appearance as a string of sausages (which is the prettiest form presented by bacteria) they take shapes of great variety and sometimes considerable beauty.<sup>26</sup>

Here vegetable (bacterial) and animal (protozoan) parasites are constructed in hierarchy, with the protozoan's specific requirements for growth as well as its aesthetic beauty given as evidence of its superiority. The variety and beauty of its shapes lends credence to its complexity and thus subtly implies that it requires, or is fit to be the subject of, specialised research. Ross continues, calling bacteria

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<sup>24</sup> By specifying protozoan and helminthic, I mean to exclude higher animals that exhibit parasitic behaviour, and refer specifically to unicellular pathogenic microorganisms and parasitic worms.

<sup>25</sup> G. Giles, 'The Etiology of Kala-Azar' *Indian Medical Gazette* 1(1898)33 pp.1-3 (p.3).

<sup>26</sup> Ronald Ross, 'Malaria and the Mosquito' *Pioneer*, Saturday 3 August 1895, p.3.

'antiquated' and praising the malaria parasites' willingness to 'show themselves and be admired'.<sup>27</sup> He uses human frames of reference to talk about their life cycles, employing the analogy of boats on a river travelling at 'three thousand miles a minute' to convey their speed, and describing the ex-flagellation of the gametocyte as looking 'just as if several little snakes were issuing from an orange'.<sup>28</sup> These metaphors help to explain the malaria parasite to a non-specialist audience; the references to boats, and before that, trains, form a migratory or imperial framework that recalls helminthologist T. Spencer Cobbold's understanding of the parasite-host relationship as like that of a country or district to a coloniser.<sup>29</sup> Descriptions of parasites and their hosts often evoke travel metaphors, like Ross's reference to mosquito eggs as 'shaped curiously like ancient boats with raised stern and prow'—a comparison that evoked imagery of the *Plasmodium* parasites hijacking these vessels for their own migratory purposes.<sup>30</sup> In an article on *Filaria sanguinis hominis*, Patrick Manson investigated the mosquito as vector, only in this case he dubbed it 'nurse'. Here he described the eggs as like 'Etruscan vases'<sup>31</sup> alluding to the aesthetic beauty associated with the life cycles of micro-organisms, a motif we have seen with both Ross's descriptions of *Plasmodium* and William MacGregor's conception of the *Plasmodium* lifecycle discussed in Chapter Two. The imagery of 'ancient' boats and 'Etruscan' vases forms a frame of reference that precedes, and interacts with,

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<sup>27</sup> Ross, 'Malaria and the Mosquito', p.3.

<sup>28</sup> Ross, 'Malaria and the Mosquito', p.3.

<sup>29</sup> See: T. Spencer Cobbold, *Entozoa: an Introduction to the Study of Helminthology, With Reference More Particularly to the Internal Parasites of Man* (London: Groombridge and Sons, 1864) p.4.

<sup>30</sup> Ronald Ross. 'On Some Peculiar Pigmented Cells Found in Two Mosquitos Fed on Malarial Blood by Surgeon-Major Ronald Ross I.M.S. (With Note by Surgeon-Major Smyth, M.D. I.M.S.)' *British Medical Journal*, 2(1897)1929, pp.1786-89. (p.1786).

<sup>31</sup> Patrick Manson. 'On the Development of *Filaria sanguinis hominis*, and on the Mosquito Considered as a Nurse. By Patrick Manson M.D. (Communicated by Dr. Cobbold, F.R.S, F.L.S.)' *Journal of the Linnean Society of London, Zoology*, 14(1878)75 pp.304-11. (p.306),

modern western culture, another motif that we've seen associated with depictions of parasites and their relationships with host bodies.

Such characterisations posit the life cycles of these parasites as on a par with the discovery of antiquities, a move that prioritises their identity as scientific curiosities and familiarises, even humanises, them as cultural objects. These metaphors function as access points for the public understanding of science, something undoubtedly important to Ross, who spent the majority of his latter years campaigning for pensions for scientists, chiefly through appealing to public sensibility. Ross's popularisation techniques did however attract some criticism from colleagues. Surgeon-Lieut-Colonel Edward Lawrie wrote in 1896:

Men who write of Laveran's bodies as "pets" "beasts" "brutes" or (save the mark) "bugs" have been extolled in the *British Medical Journal* as scientists in terms of the highest praise, while senior men of the calibre of J. M. Cunningham, Bryden, Rice, Marston, D. D. Cunningham, Crombie, Sanders and a host of others whose names alone call up feelings of respect and admiration throughout the length and breadth of this land, have been as freely reprobated and lampooned.<sup>32</sup>

Lawrie's criticism undoubtedly refers to articles like Ross's wherein he refers to plasmodia as 'our little malaria pets'.<sup>33</sup> However, the underlying issue here is not one of terminology, but of imperial politics. Ross's popularisation techniques are,

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<sup>32</sup> Edward Lawrie. 'A Lecture on Malaria Delivered at the Grant Medical College, Bombay on Monday 6<sup>th</sup> April 1896 by Surgeon-Lieut-Colonel Ed. Lawrie, Residency Surgeon, Hyderabad,' *Indian Lancet*, 16 April 1896, pp.375-80.

<sup>33</sup> Ronald Ross, 'Malaria and the Mosquito', p.3.

to Lawrie, tantamount to trivialisation, and Ross's choice of terminology—in medical journals as well as in the popular press—demonstrate, for Lawrie, his 'unscientific' treatment of the subject. Lawrie perceives a bias toward the likes of Manson, Mannaberg, and Laveran—European investigators who to his mind are sanctioned by British medical authority—versus the perceived dismissal of medical research carried out in India by imperial physicians.<sup>34</sup> Lawrie and his co-workers criticised the work of parasitologists working on malaria; Lawrie even referred to depictions of Laveran's bodies as 'fanciful pictures [...] drawn from the imagination'.<sup>35</sup> This rivalry encouraged the association of the parasitic theory of malaria with western medical authority, rather than with colonial experience.

Alexander Crombie also criticised what he considered to be the unfair treatment of Indian medical research in an article that attracted counter criticism from the *British Medical Journal*, who labelled Crombie's appraisal 'resentful' and argued that his own knowledge was 'only second-hand'.<sup>36</sup> Another of Lawrie's overlooked colleagues, Lewis Sanders, published a pamphlet entitled 'A Modern Superstition in Disease: The Germ Theory Reconsidered' in 1889, which deemed germ theory 'the fetish of to-day, destined to become the derision of to-morrow'.<sup>37</sup> The controversy over the malaria parasite continued into the early twentieth century, despite Ross's Nobel Prize winning mosquito-malaria work. Lawrie and

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<sup>34</sup> Although Lawrie's opposition to the plasmodium parasite was unwarranted, there is some truth in his complaint. Ross, working in India, often relied on the authority and connections of Manson in Britain to get his research heard. The authoritative hierarchy inherent in this arrangement further characterises parasitology as an imperial science.

<sup>35</sup> Edward Lawrie, 'The Cause of Malaria. Extract from an Address Delivered at the Grant Medical College, Bombay, April 4th 1896 by Surgeon-Lieutenant-Colonel E. Lawrie, M.B., Residency Surgeon, Hyderabad' *British Medical Journal* 1(1896)1845 pp.1135-1138. (p.1135)

<sup>36</sup> 'Medical Research in India' *British Medical Journal* 2(1895)1808 pp.448-489. (p.489)

<sup>37</sup> Lewis Sanders, 'A Modern Superstition in Disease: The Germ Theory Reconsidered' *LSE Selected Pamphlets* (1889) LSE Library. *JSTOR* <<http://www.jstor.org/stable/60241264>> [accessed 13 June 2015]



Ross publicly debated in the medical press in a series of articles and responses, which saw Ross dub Lawrie, 'the inventor of a new "fad"—he is a violent "antiplasmodist",<sup>38</sup> and saw Lawrie accuse Ross of professional ignorance and myth making. In what is perhaps an attack on the medical press's apparent institutional biases, Lawrie signed off with a parody of Alfred Denis Godley's *Rubaiyyat of Moderations* :

'Tis all they need, they are content with these:

Not facts they want, but soft Hypotheses

Which none need take the Pains to verify:

*E.g.* the Theory of Anopheles.<sup>39</sup>

Here Lawrie objects to not just the parasitic theory of malaria, but also the notion of its transmission via a mosquito vector. Moreover, he objects to what he dubbed the 'soft hypotheses' of the parasitologists, specifically naming Ross, Manson, MacCallum, 'and other discoverers of the sham sexual processes among Laveran's bodies'. Ross argued that Lawrie's own research was ill founded, and Lawrie returned with a personal attack: 'This is a fine sample of *criticism Rossii*'—a reference that reveals Lawrie's bitterness concerning the recognition gained by European researchers. He writes: 'I do not consider it science to call the "sports" in the blood of healthy birds by such names as "Grassi" and "Danilewskii"<sup>40</sup>—a reference to the naming of the malaria parasite species *Protoseosoma grassii* and

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<sup>38</sup> Ronald Ross, 'Colonel Lawrie on Malaria' *British Medical Journal* 1(1900)2038 p.171.

<sup>39</sup> Edward Lawrie, 'Colonel Lawrie on Malaria' *British Medical Journal* 1(1900)2044 p.547.

<sup>40</sup> Lawrie, 'Colonel Lawrie on Malaria' p.547. NB. Basil Danilewsky discovered malaria parasites in the blood of birds in 1884.

*Haemamoeba Danilewskii*, recorded in Ross and Fielding-Ould's 1900 paper on the life history of the parasites of malaria,<sup>41</sup> and reprinted in the revised edition of Patrick Manson's *Tropical Diseases* in 1900.<sup>42</sup>

For all this professional bickering, Dr George Thin pointed out in *The Lancet* as early as 1896 that the high profile debate, instigated by Lawrie and reported in *The Times*, had done much to bring the parasitic theory of malaria into the public domain: 'thousands of readers learnt for the first time from these telegrams that Italian physicians believed that malaria was caused by a parasite, and by reading them many medical men doubtless learnt for the first time that there might legitimately be two sides to this question'.<sup>43</sup> The 'antiplasmodists' objections to the parasitic theory of malaria did much to publicise their cause to professionals and laymen alike. Moreover, Lawrie's specific objections to the perceived sympathetic and unscientific treatment of animal parasites, draws attention to a truism regarding parasitologists' relationships to their research subjects. The diminutive pet naming of Laveran's bodies reflects the conception of these parasites as small animals with complex life cycles and morphologies, rather than as vegetables or toxins. When Ross and Manson discuss the malaria parasite in their 1895-1899 correspondence, they talk of the plasmodium in terms of the 'beast' in the mosquito, and conceive of it in relation to human emotions and behaviours: 'The merry microbes goes about his way regardless of what people think and say about it'.<sup>44</sup> Others too speak of them using the

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<sup>41</sup> Ronald Ross and R. Fielding-Ould 'Diagrams Illustrating the Life History of the Parasites of Malaria' *Quarterly Journal of Microscopical Science* 2(1900)43 pp.571-79.

<sup>42</sup> Patrick Manson, *Tropical Diseases: A Manual of the Diseases of Warm Climates*, p.51.

<sup>43</sup> George Thin, 'A Note on Surgeon-Lieutenant-Colonel Lawrie's Address on the Cause of Malaria' *The Lancet* 147(1896)3795 pp.1414-17. (pp.1414-15).

<sup>44</sup> Patrick Manson, 'Letter 23 02/008' *The Beast in the Mosquito*, pp.70-71. (p.71).

language of personification; in a 1910 letter to Ross, Dr Arthur Bagshawe thanked Ross for sending him a malaria periodicity chart with the jocular observation: '[it is] almost as if the parasites knew the days of the week!'<sup>45</sup>

Although not seriously indulging the notion that parasites have anything like human emotions or motives, parasitologists certainly used animal paradigms to understand these organisms. Scientific papers in the 1890s and 1900s are plagued with comparisons to eels, leeches, and snakes; indeed, in response to Lawrie's denial of the existence of the malaria parasite, Ross uses these analogies to emphasise the parasite's animal character: 'if these bodies are not endowed with an independent life, then eels, snakes and worms are dead creatures'.<sup>46</sup> In an article published in *Science Progress* in 1919, Ross even advanced an animal theory of mind, extended to unicellular organisms. After some anecdotal stories of animals demonstrating apparently calculated thoughts and behaviours, including amoebae, he insisted: 'it flatters our vanity to think that we are the only creatures who possess mind; but probably the elements of mind—that is, memory, imagination, and judgement—exist all through animal life, even down to unicellular organisms.'<sup>47</sup>

These animal paradigms and the recognition of the mental similarities between parasites and humans provided more support for the use of parasites in analogies concerning human society, and vice versa. John Masefield, for example, continuously invokes the motif of the microorganism in his *Multitude and Solitude* (1909) to critique the modern social world. Roger explains: 'we are no longer an

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<sup>45</sup> London, LSHTM. RC. Ross/102/103/11. Arthur Bagshaw to Ross, 10 May 1910.

<sup>46</sup> Ronald Ross, 'Surgn.-Lieut.-Col. Lawrie and the Parasite of Malaria' *Indian Medical Gazette* 11(1896)10 pp.1-13. (p.6).

<sup>47</sup> Ronald Ross, 'The Mathematical Amoeba' *Science Progress* 13(1919)52 pp.638-39. (p.639).

ordered world. I believe there is a kind of bacillus, isn't there, which, when exposed to the open air, away from its home in the blood, flies about wildly in all directions? That is what we are doing' (134). In *Animals and the Human Imagination* (2012), Aaron Gross discusses the significant role that animals play in acts of human self-conception. He argues that the 'co-construction' of the human and animal as categories of reference for understanding the world, is, particularly in the Western world, a fundamental process for conceiving of, and delineating, human identity. However, this human/animal binary is unstable and contested, particularly in the nineteenth century when evolutionary theory had begun to 'render implausible' the 'out-dated human exceptionalism' that had previously separated humans from the natural world.<sup>48</sup> The resultant blurring of boundaries that followed Darwin's popularisation of the notion of common descent contributed to a crisis concerning individual identity that was already being voiced in regard to the parasite-host relationship. Ideas concerning the purpose of parasites and the susceptibility of hosts had already brought the morality and ethnicity of the host into question, suggesting that those with compromised morals or 'inferior' racial heritage were more susceptible to parasitic infestation. In the late nineteenth century, the coadaptation of parasites and hosts—gestured to in Darwin's *On the Origin of Species* (1859)<sup>49</sup>—and the interconnectedness of the universe—represented by Darwin's tangled bank

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<sup>48</sup> Aaron Gross, 'Introduction and Overview: Animal Others and Animal Studies' *Animals and the Human Imagination: A Companion to Animal Studies* eds. Aaron Gross and Anne Vallely (New York: Columbia University Press, 2012) pp.1-24. (p.2).

<sup>49</sup> Charles Darwin, 'On the Origin of Species' *Evolutionary Writings: Including the Autobiographies* ed. James A. Secord (Oxford: Oxford University Press, 2008) pp.107-211. See for example: pp.137-39.

metaphor—were recognised by parasitologists as demonstrative of the importance of a holistic or bionomic approach to science.

As noted in chapter two, William McGregor highlighted this interconnectedness in relation to tropical medicine by citing lines from Goethe's *Faust* that showcased the unity and transcendence of Nature. However, McGregor framed this idea, articulated by the parasite lifecycle, in terms of man's domination of the natural world. The investigation of malaria had, according to McGregor, furnished the world with 'some of the finest examples of *human* intelligence'; he placed particular significance on the successful 'prediction' of the *Plasmodium* parasite's life cycle, embodied by the mosquito-malaria theory, and used it to celebrate British and European scientific greatness. However, the recognition of the complexities of the parasite-host relationship brought into question the hierarchy of man over nature. The complexities of parasite life cycles and the recognition that some diseases are caused, not by inorganic compounds or 'poisons', but by other organisms, undermined the morphological and evolutionary superiority of the human. Discussions of active transmission and parasite or vector 'intentions' aroused wider debates concerning the human/animal divide.

Vectorism, a relatively new concept at the fin de siècle, became a locus of anxiety, with the notion of active transmission used as an imaginative paradigm that highlighted the dangers of the natural world. We can see this in Masefield's novel with its apprehensive ending that sees humanity 'walk[ing] sentenced, a prey to all things baser' (300). However, the parasite-vector-host relationship was equally used to critique human endeavour. Roger observes that '[tsetse] flies

have an uncanny knowledge', and wonders how they know where most effectively to bite: between the shoulder blades, where they cannot be easily dislodged. 'Is it mere inherited instinct?' he wonders doubtfully (229). He characterises the tsetse fly vector as having 'no place in the scheme of the world except to transplant the trypanosome from where he is harmless to where he is deadly' (229) compounding its malicious existence and endowing it with more intent than is perhaps fair—the transmission of trypanosomes being a secondary consequence of its search for a blood-meal. Lionel then outlines the similarity between tsetse flies and English society:

"Lots of men are like that," said Lionel. "You can go along any London street and see thousands of them outside those disgusting pot-houses. Men with no place in the scheme of the world, except to transplant intoxicants from the casks, where they are harmless, to their insides, where they become deadly, both to themselves and to society. Any self-respecting State would drown the brutes in their own beer. Yet the brutes don't get drowned. And as they do not there must be a scientific reason. Either the State must be so rotten that the germs are neutralised by other germs, or the germs must have some dim sort of efficiency for life, just as the tsetses have. They have the tenacity of the very low organism. It is one of the mysteries of life to me that a man tends to lose that tenacity and efficiency for life as soon as he becomes sufficiently subtle and fine to be really worth having in the world" (229-30).

Masefield's analogy between western society and the parasite-vector-host relationship functions to both critique modern European culture, and to offer a reference point for understanding parasite transmission. In labelling some men 'germs' to be 'neutralised', Masefield employs narratives of degeneration, adaptation, and eugenics. The tenacity of both men and tsetse flies, associated with biological lowness, is allied with evolutionary adaptation, which evokes the anxiety examined in chapter one that social parasites might mimic the degeneration of biological parasites by becoming too reliant on the exploitation of others. Parasitologists too used the parasite-vector-host relationship as a vehicle for discussing social and professional concerns. Like Lawrie's characterisation of Ross's work as parasitic—*Criticism rossii*—Ross uses the parasite-vector-host paradigm to comment on Italian malaria work: 'Bignami is a pure villain; he wants to secrete a mosquito theory of his own. He is wild with you. He wants to bite into the heart of your theory, suck its juices & then bloat & swell into a discoverer'.<sup>50</sup>

### **Science, Unbound: Science in the Field and the Ethics of Experimentation**

The parasite-vector-host relationship, while providing an astute and flexible metaphor for discussing society, also embodied an ethical dilemma: in order to investigate this relationship, scientists needed to experiment on human and animal subjects. These ethical concerns can be read in a series of letters between Manson and Ross in 1895, in which they attempt to navigate the political, professional, and ethical obstacles to research. Ross bemoaned his fraught

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<sup>50</sup> Ronald Ross, 'Letter 52 02/097' *Beast in the Mosquito*, pp.132-34. (p.133).

relationship with the British and British-Indian governments, arguing that despite his work being supported by the Rajah of Patiala, it was opposed by the Lieutenant-Governor of the Punjab, British colonial administrator, Dennis Fitzpatrick.<sup>51</sup> He subsequently used parasitic frameworks to highlight the relationship between the government and its people, and to comment on what Jordan Goodman, Anthony McElliot, and Lara Marks call the 'usefulness' of human bodies. These scholars argue that, at the end of the nineteenth century, there was a shift away from self-experimentation and toward the wider use of human and animal subjects, as 'the site of individual experimentation gave way to more general terrain that took in society per se.'<sup>52</sup> This shift is articulated satirically in the Ross-Manson correspondence. Manson had suggested, half-jokingly, a self-experiment: that he might swallow some water fleas (*Cyclops quadricornis*) containing guinea worm embryos in order to elucidate how they are transmitted to man.<sup>53</sup> 'What do you think is the duty of a father of a family in such a case,' he asked, 'would he be justified?'<sup>54</sup> Ross responded:

*You must not think of trying the cyclops.* What I suggest is this. Bribe the man at the bar in the House of Commons to put the cyclopes in the drinks of the M.P.s. It would draw attention to science, put a stop to much useless

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<sup>51</sup> Ronald Ross, 'Letter 12 02/071' *Beast in the Mosquito* pp.33-36. (p.36).

<sup>52</sup> Jordan Goodman, Anthony McElliot, and Lara Marks, 'Making Human Bodies Useful: Historicising Medical Experiments in the Twentieth Century' *Useful Bodies: Humans in the Service of Medical Science in the Twentieth Century* eds. Jordan Goodman, Anthony McElliot, and Lara Marks (Baltimore: Johns Hopkins University Press, 2003) pp.1-23. (p.2).

<sup>53</sup> *Dracunculus medinensis*—the guinea worm parasite—causes dracunculiasis or guinea worm disease in humans. Its intermediate host is a water-born crustacean *Cyclops quadricornis*.

<sup>54</sup> Patrick Manson, 'Letter 13 02/005' *Beast in the Mosquito*, pp.36-38. (p.38).



talking by keeping M.P.s off their legs, and not injure anyone of consequence.<sup>55</sup>

Although written with his usual biting humour, Ross's comment does articulate a real research problem: the ethics of procuring volunteers. He frequently bemoaned the lack of volunteers in India, complaining that the natives would not let him prick their fingers for blood owing to their superstitions.<sup>56</sup> Having limited access to malarial cases, and frequently having his researches disrupted by relocation or reassignment, Ross took a dim view of government officials, who did not seem to take tropical research seriously. Indeed this correspondence was written at a time when the lack of funding and training for physicians in tropical climates was beginning to be widely recognised as an imperial problem. *The British Medical Journal* in 1894 had bemoaned the ignorance of English physicians to tropical diseases, despite England being 'incomparably the greatest tropical as well as colonial power' and had asserted that it was 'not right that [England] should essay to govern millions of human beings, and withhold from them the full measure of civilisation', by which they meant the civilisation that comes with appropriate specialised medical knowledge, or the dominance of man over tropical nature.<sup>57</sup> The article asserted that it was also 'not right that lives should be sacrificed in the acquisition of knowledge', a statement that could refer

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<sup>55</sup> Ronald Ross, 'Letter 14 02/072' *Beast in the Mosquito*, pp.39-42. (p.41).

<sup>56</sup> Ross attributes this to Haffkine's cholera and plague vaccines, and the native belief that the government were trying to inject them with pathogens, rather than protect them against them. 'Every medical man becomes an object of suspicion, and you can understand I am especially so [...] My man Mahomed Bux, is looked upon with worse suspicion than myself and in fact started the scare by shooting at sparrows near Punkarbari. They said there is a doctor sahib shooting coolies preparatory to inoculation!' See: Ronald Ross, *Memoirs*, pp.284-85.

<sup>57</sup> 'Ignorance of Tropical Diseases', p.1491.

to the loss of life due to medical ignorance—a learn-by-experience reality—or to the ethics associated with experimental medicine.

Ross considers those same ethics when discussing his trouble finding volunteers. 'The men willing to be experimented on are moreover very few,' he notes in a letter to Manson, 'don't for heaven's sake mention at the B.M. Association that Lutchman is a dhooley-bearer—did I tell you so?—he is a Government servant. To give a Government servant fever would be a crime!'<sup>58</sup> This assertion reveals the superficial nature of his ethical code; he is concerned here only with the consequences of disclosure. Moreover, Lutchman's 'usefulness' as a body for scientific research is negated only by his 'usefulness' to the state—a troubling acknowledgement of the dangers of human experimentation for the patient.

Goodman *et al* argue that, in the early twentieth century, the boundaries between science and the state were being eroded as 'medical men and scientists were absorbed into the wider machinery of the state in ever-increasing numbers' (5). The tension between science and state is evident in this correspondence, as well as in Ross's wider experiences working under the British and British-Indian governments. Following his discussion of Lutchman, Ross added 'to give a lecturer on tropical diseases at two London hospitals guinea-worm would be a worse [crime],' an addendum that espouses intellectual, if not racial, hegemony. Significantly, Ross is happy to admit to his experimentation on 'bazaar people'<sup>59</sup> and Indian prisoners, thus engaging in a discourse about who should and should not be sacrificed in the name of science. When discussing a different experiment,

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<sup>58</sup> Ronald Ross, 'Letter 14 02/072' *Beast in the Mosquito*, p.40.

<sup>59</sup> Ronald Ross, 'Letter 14 02/072' *Beast in the Mosquito*, p.39.

involving the consumption of dead infected mosquitoes, Ross notes that it 'would be interesting but perhaps not altogether safe', invoking the heroic imperial rhetoric of parasitology with the observation: '*Dulce et decorum est pro patria mori*. But don't do it yourself!'<sup>60</sup> Who should and should not die for their country is a dilemma that reflects, to some extent, research scientists' emerging identity as 'determinators of a bioracially constituted state [...] as its gatekeepers and guardians, programmed with a mission to secure a utopian healthy society' (5). This understanding of the role of scientists and their relationship to the state was also beginning to be expressed in fiction. Unlike the earlier stories that characterised tropical disease as an individual concern, Masefield's *Multitude and Solitude* (1909) broaches the ethics of human experimentation on Africans in the context of scientists' wider social responsibilities.

When considering to whom they should give curative atoxyl, Lionel comments: 'we are choosing for the future. As it happens we are choosing for the future of a fraction of a wretched little African tribe. The scientist will one day choose, just as finally, for the future of man [...] Here are the wise men choosing who are to inherit the earth' (233-34). Needless to say the eugenic overtones of this statement are troubling. However the rhetoric of choosing who to risk and choosing who to save make Ross and Masefield's decisions quite distinct. Whilst both men consider the ethics of experimenting on human subjects, Ross's 'volunteers' are put into potential danger when he proposes to attempt to give them malaria: 'presently I shall give infected mosquitoes, & the water that they

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<sup>60</sup> Patrick Manson, 'Letter 11 02/004' *Beast in the Mosquito*, pp.31-33. (p.32).

have died in, to natives on payment & see result'.<sup>61</sup> Masefield on the other hand has his characters choose who to *save*, a decision that while reinforcing the pathological rhetoric of the tropics, does suggest that the natives are worth saving (even if only in the pursuit of knowledge). Indeed, Masefield tells us that despite their 'brutish' physiognomies, they were 'on the whole, a much nicer-looking lot than the boys who sell papers in London' (236-37).

More significantly however, Masefield's novel positions Africa as an experimental space, a kind of living laboratory that provides the conditions necessary for experimental medicine. Lionel's understanding of experimental science is clearly informed by his belief in its wider relevance to society. The bioracial relationship between science and the state is further emphasised upon the investigators return to England. They discover that a Japanese researcher has beaten them to the cure. However, the absence of the cure from Africa, where it is most needed (as evidenced by their surprise upon hearing of it) suggests that it is not primarily for Africans, but for the protection of colonisers. In Masefield's novel, survival of trypanosomiasis is determined, not by natural resistance, but by medicinal help administered by 'wise men' of science, who choose those worthy of 'inherit[ing] the earth'. In this way the novel uses human experimentation to explore the relationship between science and nationhood, with Africa as both a British colony and a pathological space. As Masefield presents it, human experimentation in the colonies is a necessary consequence of this dual identity. The work of parasitologists contributed to these fictional explorations by

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<sup>61</sup> Ronald Ross, 'Letter 4 02/066' *Beast in the Mosquito*, pp.8-13. (p.12).

providing a hermeneutic framework that hinged upon the practice of science as the imperative of an imperial nation.

### **"The Fever of War": Tropical Parasites and the Body as Battleground**

He was not killed [by the phagocyte] or sucked in; but kept poking him in the ribs in different parts of the body. I was astonished; & so apparently was the phagocyte. He kept at this for about ¼ hour & then went away across two fields & went straight at another phagocyte! [...] after 50 minutes the beast seemed to be getting tired, when a very curious thing happened; a third phagocyte came at him with mouth open [...] but had no sooner got near him when the flagellum left his fallen foe & attacked the new one [...] in one minute the third phagocyte turned sharp round & ran off howling!!! I assure you. I won't swear I heard him howling, but I saw him howling. It went right across the whole field, the flagellum holding onto his tail like this { \_ }. [...] So was the fight between the flagellum & the three phagocytes. I shall write a novel on it in the style of the Three Musketeers.<sup>62</sup>

Here Ross narrativises the interactions between a *Plasmodium* parasite and three phagocytes, as seen under the microscope. The struggle, described in a letter to Manson in July 1895, describes the failure of phagocytosis, an immune mechanism theorised by Russian embryologist Elie Metchnikoff in 1883. Ross

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<sup>62</sup> Ronald Ross, 'Letter 15 02/073' *Beast in the Mosquito*, pp.41-44. (pp.42-43).

notes that the *Plasmodium* was not killed by the phagocyte or sucked in, as expected, but takes down two of the phagocyte's fellow brethren, reinforcing the prowess of the parasite, in an imaginative narrative that perpetuates the personification of these organisms. He extrapolates that phagocytes have 'no more power over free flagella than over trypanosomes',<sup>63</sup> a conclusion that privileges the parasite over the host immune response.

Leon Chernyak and Alfred Tauber argue that Metchnikoff's theory of phagocytosis, whilst not the first to claim a theory of immunity, radically reimagined the host's maintenance of its own bodily integrity.<sup>64</sup> Metchnikoff believed that certain cells of the body, which he termed phagocytes, cells which, to his mind were the very basis of multi-cellularity, *actively* worked to preserve host integrity by engulfing and digesting, not just nutrients, but also foreign pathogenic material. Tauber argues that Metchnikoff's conception of phagocytosis positioned host defence as 'only a more specialised case of determining self and non-self',<sup>65</sup> an understanding that foregrounds the importance of the boundaries—both metaphorical and actual—of selfhood. This modified understanding of identity, and the need to 'police' it with immune cells, imbues personhood with martial undertones, a characterisation that speaks to the several discourses surrounding the parasitologist and his relationship to the colonial project. The parallels between self/other and host/parasite, find congruence with those between metropole/periphery and coloniser/colonised.

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<sup>63</sup> Ronald Ross, 'Letter 15 02/073' *Beast in the Mosquito*, p.43.

<sup>64</sup> Leon Chernyak and Alfred I. Tauber, 'The Idea of Immunity: Metchnikoff's Metaphysics and Science' *Journal of the History of Biology* 23(1990)2 pp.187-249.

<sup>65</sup> Alfred I. Tauber, 'Metchnikoff and the Phagocytosis Theory' *Nature* 4(2003) pp.897-901. (p.901).

Efforts to control parasites and protect selfhood also work to control the colonies and reinforce British national identity.

The nexus of evolutionary, embryological and psychological discourses discussed in chapter one, in addition to Metchnikoff's immunological theorising, interacted with ideas about the externalisation of pathological threats (championed by mid-century helminthological research and Pasteur's germ theory) to bolster the metaphorical and actual understanding of the body as a battleground. Parasitologists highlighted the ways in which parasites were particularly well adapted to invading the host body and propagated a man versus nature rhetoric by emphasising the impact of a personified natural selection. Patrick Manson discussed the *Plasmodium* and *Filaria* parasites in a lecture given before the Royal College of the Physicians of London in 1896, reprinted in the BMJ. He argued that all parasites must leave the bodies of their hosts to fulfil their life cycle, 'in pursuit of the interests of the species they belong to', and that they do this in one of four possible ways: 'by virtue of their own efforts, of the efforts of the organism they are lodged in, by the assistance of some extraneous agency, or by the decomposition of the host after death.'<sup>66</sup> This both endowed parasites with the ability to actively propagate themselves (unlike bacteria, which were passively transmitted), and implicated an external helper in the form of the vector host. Furthermore, Manson argued that 'Nature' elected the method of liberation most practical and worked to protect the parasite, in spite of itself, suggesting less a selected adaptation, more a personified overseeing agency. He drew attention to the parallels between the sac in which *Filaria* resides and the

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<sup>66</sup> Patrick Manson, 'The Goulstonian Lectures on the Life History of the Malaria Germ Outside the Human Body', *British Medical Journal* 1(1896)1838 pp.712-17. (p.712).

red blood cell in which *Plasmodium* resides, arguing that 'Nature' had 'sheathed' both to prevent *Filaria* prematurely using its 'weapon' (oral piercing apparatus) on the blood vessels and to hide *Plasmodium* from attacks by phagocytes. 'The filaria is sheathed to prevent its committing suicide,' propounded Manson, 'the plasmodium is sheathed to protect it from being murdered.'<sup>67</sup> Masefield employs similar frameworks in *Multitude and Solitude* constructing Roger and Lionel's fight as a fight against 'Nature' rather than the individual pathogen, and observing (when discussing sleeping sickness patients) that 'Nature was resting in them' (241). The implication here is that Nature has moulded the adaptation of parasites in an uncomfortable rendering of natural selection that does not favour humanity. The language of murder and suicide, both emotive terms, solidify the hermeneutic paradigm of a distinct organismal identity vying for somatic authority.

Manson's rhetoric endows parasites with a competitive advantage that goes beyond disease warfare to suggest pathological espionage. This is not the passive invasion of bacterial foot soldiers, but the concerted efforts of highly adapted physiological saboteurs. The deceptive capabilities of the malaria parasite are compounded by Manson's use of language; he asserts that the *Plasmodium* parasite instinctively buries itself within the red blood cell, 'as much with a view to obtaining shelter from its enemy as to obtaining food' (713). He even suggests that the phagocyte pokes the red blood cell with its pseudopodia,

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<sup>67</sup> Manson, 'The Goulstonian Lectures', p.712. Manson takes part in what Catherine Belling recognises as a common feature of the complex narratives that structure encounters between humans and disease. She argues that 'in engaging the microbe as an anthropomorphic subject, whether as protagonist or as villain, we relinquish our own centrality and risk the vertiginous view of ourselves as no more than a setting or environment for microbial proliferation.' Catherine Francis Belling, 'Microbiography and Resistance in the Human Culture Medium' *Literature and Medicine* 22(2003)1 pp.84-101 (p.86).



'suspicious apparently that things were not quite as they should be'. The deception, however, prevails and the 'vigilant watchman [leaves] the masked parasite and move[s] away' (713). Inspired by Ross's letter detailing the interactions between his *Plasmodium* parasite and the 'three musketeers', Manson here indulges in a narrativisation that prioritises a teleological outlook, and consequently endows the parasite with specific motives and intentions.

When speaking of the variety of locomotive movements exhibited by the *Plasmodium*, he argues that 'they are not mere chance phenomena, designed only to puzzle and mislead the pathologist' (715), a sentiment that he had already asserted in letter correspondence with Ross: 'the malaria germ does not go into the mosquito for nothing, for fun, or for the confusion of the pathologist. It has no notion of a practical joke. It is there for a purpose and that purpose depends upon its own interests—germs are selfish brutes'.<sup>68</sup> Manson places *Plasmodium* parasites in a position of not just deception, but aggression, quoting Ross's observations, which he calls 'the adventures of a flagellum', to argue that the flagellate form of the parasite does indeed actively attack. Moreover, the ability to attack to some extent defines the parasite's true identity: Manson confidently asserts that degenerationists, who believe Laveran's bodies to be degenerated protoplasm and not living parasites, will be stumped by these observations, for were it not a true parasite 'would it live thus long, move thus actively and move with manifest purpose? Would it resist the attacks of the phagocytes, much less overthrow them?' (716).

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<sup>68</sup> Patrick Manson, 'Letter 11 02/004' *Beast in the Mosquito*, pp31-33. (p.31).

The battleground rhetoric articulated here, although bolstered by the scientific ideas mentioned earlier, was not a new phenomenon, nor one isolated to Manson and Ross. Indeed the metaphor was widespread, from the translator's choice to describe the phagocytes' interactions with parasites as a 'battle' in the English edition of Julius Mannaberg's 'The Malarial Parasites' (1894),<sup>69</sup> to William Osler's characterisation of phagocytosis as 'active destructive warfare'<sup>70</sup> in 1889. Masefield too perpetuates this framework in his narrator's appraisal of parasitic disease: 'As to the action of the trypanosome upon the human being, that was a question for trained scientists. It probably amounted to little more than a battle with the white corpuscles' (156). In *Illness as Metaphor* Susan Sontag credits the rise of bacteriology in the 1880s and the recognition of bacteriological agents as invasive and pathogenic, with the stimulation of the widespread use of the military metaphor in relation to disease.<sup>71</sup> This was also no doubt reinforced by the advent of immunology and its recognition of an active defence mounted by the host against external threats. I argue that parasitology offered a nuancing of this metaphor, strengthened by the parasite's claims to an 'animal', rather than 'vegetable' nature. The characterisation of parasitic infestation as active, transformative, and facilitated by vectors, positioned the parasite-vector-host relationship further within the lexis of warfare.

Paul Hodgkin recognises the on-going use of military and detective metaphors to discuss medicine, and argues that this characterisation shifts focus

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<sup>69</sup> Julius Mannaberg, 'The Malarial Parasites: A Description Based Upon Observations Made by the Author and by Other Observers' trans. R.W. Felkin, *Two Monographs on Malaria and the Parasites of Malarial Fevers* (London: The New Sydenham Society, 1894) p.400.

<sup>70</sup> 'Phagocytes and Parasites' *British Medical Journal* 1(1889)1479 p.1012.

<sup>71</sup> Susan Sontag, *Illness as Metaphor and AIDS and its Metaphors* (London: Penguin Books, 1991) p.63.

away from the patient, ensuring that doctors and diseases are made 'protagonists'.<sup>72</sup> This is evident in relation to parasitology, which, at the turn of the century, situated disease as a battle between parasites and parasitologists, as much as between parasites and the host body.<sup>73</sup> In 1914 Ross supported just this standoff, using warfare as a metaphor to demonstrate the co-ordinated and strategic response of tropical medicine to the malaria problem:

The armies of science, like those of nations, commence in small beginnings and advance in parallel columns. If one column is checked by insuperable difficulties, the others endeavour to outflank the point of resistance; and a victory is often won by this means in science as in war. (Excuse my military similes, which appear to be appropriate at this hour).<sup>74</sup>

Ross is influenced here by the actual outbreak of war. However, the imperial overtones of parasitology discourse are by this point already well established. His earlier researches were too undoubtedly influenced by his position in the Indian Medical Service and its relationship to the military. David Arnold highlights the

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<sup>72</sup> Paul Hodgkin, 'Medicine is War: and Other Medical Metaphors' *British Medical Journal* 291(1985)6511 pp.1820-21. (p.1820).

<sup>73</sup> See Chapter Two on the knights of science, and also see: e.g. London, LSHTM. RC. Ross/70/03. Newspaper cutting 'The War Against Mosquitoes in Sierra Leone' (1901), which situates the 'war' as between science (more specifically the Liverpool school) and malaria (represented by its mosquito vector): 'Few people in this old country appear quite to understand the significance of the new kind of war which is now being started in many parts of the tropical world – notably by the Liverpool School of Tropical Medicine in West Africa. Many persons who are not acquainted with the facts have looked upon this campaign as one of the wildest ones ever attempted. Not So science. Sure of her facts – reached only by the most laborious investigations – she has decreed that the tyranny of the mosquito over the principal civilised towns in the tropics must cease; and cease it will.'

<sup>74</sup> Ronald Ross, 'Malaria and the Transmission of Diseases. Huxley Lecture delivered at Charing Cross Hospital on Nov 2nd 1914' *Nature* 94(1914)2349 pp.267-72. (p.66).

significance of the IMS and argues that the 'practical and political consequences of [the] intimate connection between medicine and the military were enormous'<sup>75</sup> and impacted the very nature and perception of medicine in India, and (I would expand) of tropical medicine generally. The use of this militarised language in relation to disease, particularly tropical disease, is reflected in, and propagated by, novelistic encounters between humans and microbes. The violent hallucinatory encounter between Roger Naldrett and the Trypanosome parasite discussed in the previous section too is framed by martial imagery. The military framing of the tsetse fly vector in this case is more than metaphorical: 'He began to see an endless army of artillery going over a pass. The men were all dark; the guns were all painted black; the horses were black [...] Instantly *they changed to tsetses*, riding on dying cattle.'<sup>76</sup> The tsetse flies are here made synonymous with 'men with guns', perpetuating the imagery of parasites as deadly ammunition.

Mary Kingsley in *Travels in West Africa* (1897) also used the metaphor of battle in her description of the trials and tribulations of colonial life for British men working in West Africa, men whose battles she argued:

[...] have been fought out on lonely beaches far away from home and friends and often from another white man's help, sometimes with savages, but more often with a more deadly foe, with none of the anodyne to death and danger given by the companionship of hundreds of fellow soldiers in a fight with a foe you can see, but with a foe you can see only

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<sup>75</sup> David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth Century India*. (Berkeley: University of California Press, 1993) pp.62-63.

<sup>76</sup> Masefield, *Multitude and Solitude*, pp.195-96. [italics mine]

incarnate in the dreams of your delirium, which runs as a poison in  
burning veins and aching brain the dread West Coast fever.<sup>77</sup>

Here Kingsley expresses the individualism of battle with disease, a battle that patients must take on alone. In identifying the microbial 'foe' as one, which 'you can only see incarnate in the dreams of your delirium', she highlights the insidiousness of these invisible agents—a striking articulation of what Roger Naldrett in *Multitude and Solitude* experiences during his traumatic hallucination of the trypanosome parasite and its tsetse fly vector.

The war-like encounter between humans and microbes is analogised in H. G. Wells's 1898 novel *The War of the Worlds*. Its very title evokes the polarising two worlds rhetoric that permeates microbiology, present in the very first conceptions of microorganisms in the late seventeenth century, then termed animalcules or infusorians. Wells's narrative compounds this model by setting up a number of spatial parallels, using both the telescope and microscope to challenge taxonomic hierarchies. In the opening lines of the novel he sets up antitheses between men, Martians, and microorganisms, a move that expresses complex ideas about mankind's anxieties concerning the natural world: 'as men busied themselves about their various concerns they were scrutinised and studied, perhaps almost as narrowly as a man with a microscope might scrutinise the transient creatures that swarm and multiply in a drop of water'.<sup>78</sup> This comparative framework echoed English scientist Gideon Algernon Mantell, who

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<sup>77</sup> Mary Kingsley, *Travels in West Africa: Congo Francais, Corisco and Cameroons* (London: Macmillan, 1897) p.691.

<sup>78</sup> H. G. Wells, *The War of the Worlds* ed. Patrick Parrinder (1898; London: Penguin Books, 2005) p.7.

in 1846 asserted that: 'the air, the earth, and the waters teem with numberless myriads of creatures, which are as unknown and as unapproachable to the great mass of mankind, as are the inhabitants of another planet.'<sup>79</sup> Wells's spatial hierarchy—the invisible world of the microorganisms watched by men, and the world of men 'keenly watched by intelligences greater than [man's]'—is also paralleled in Mantell's treatise on micro-organisms, wherein he discusses the possibility of invisible creatures with 'higher attributes and subtler natures' (4). While resisting the urge to endow microorganisms with more complex natures than ours, Mantell does use their discovery to lend credence to the idea that other beings of a higher nature might also exist. Mantell ruminates:

That there should be more species of intelligent creatures above us, than there are of sensible and material beings below us, is probable to me [...] that the species of creatures should by gentle degrees ascend upwards from us towards Infinite Perfection, as we see they gradually do from us downwards (5).

Wells nuances this idea, suggesting that the 'Infinite Perfection' of the species of intelligent creatures above us might, contrary to the spiritual machinations of Mantell, be products of Natural Selection. He sets up an evolutionary framework at the beginning of the novel when the narrator recollects a discussion about life on Mars with Ogilvy: 'he pointed out to me how unlikely it was that organic evolution had taken the same direction in the two adjacent planets. "The chances

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<sup>79</sup> Gideon Algernon Mantell, *Thoughts on Animalcules, or, a Glimpse of the Invisible World Revealed by the Microscope* (London: John Murray, 1846) p.7.

against anything man-like on Mars are a million to one," he said' (11). Wells then describes this alternative evolutionary pathway with aesthetic and morphological divergences that articulate the anxiety, propounded elsewhere by Wells, that '[dominant species will] invariably fall to some humble creature, which nature is quietly preparing in the 'abyss'.<sup>80</sup> The Martians, then, articulate an anxiety concerning the lower orders of nature and, at the same time, interrogate the very ranking of 'higher' and 'lower' organisms. When the narrator first sees the Martians, he feels sorry for them—'it hardly seemed a fair fight [...] they seemed very helpless in that pit of theirs' (40). However, he soon realises that their adaptations, which span both the physiological and the mechanical, give them an unparalleled combative advantage. With 'lank tentacular appendage[s]' (21), and 'something fungoid in the oily brown skin' (22), Wells's Martians—dubbed by a soldier 'Octopuses' (39)—parallel the characterisation of microorganisms, which were also compared to sea creatures. Indeed the Martians in many ways embody the threat of the microorganism, combining a seemingly 'primitive' morphology with the ability to cause harm. Likewise, they are characterised as pathological, rather than predatory, and their invasion is seen as a threat to the integrity of the individual, as well as society. The London landscape stands in for the human body, a symbolic conflation evident in the references to the 'skin' (36) of planet Earth and to the 'inflammation' (37) caused by the Martians' presence. The narrator aligns the Martian invasion directly with the invasion of a pathogenic organism when he notes that, in the hours following their arrival, 'the fever of war that would presently clog vein and artery, deaden nerve and destroy brain, had still to

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<sup>80</sup> H. G. Wells, *H. G. Wells: Early Writings in Science and Science Fiction* eds. Robert M. Philmus and David Y. Hughes (Berkeley: University of California Press, 1975) p.9.

develop' (37). This also conflates fever and war in ways that not only gesture toward the military conceptions of the diseased body, but also uses their association to re-frame warfare itself as a pathological state.

Alan Bewell argues that *The War of the Worlds* can be read as a commentary on British imperial relations, with the Martian invasion as a critique of the colonial encounter. The Martians embody Stephen Arata's notion of 'reverse colonisation'—the anxiety that the colonised Other will invade and dominate the metropole—a reversal that demonstrates 'imperial practices mirrored back in monstrous forms'.<sup>81</sup> Thus they symbolise both the anxiety of imperial retaliation and the guilt of imperial dominion. This dual hermeneutic is manifest in the narrator's warning: 'before we judge of them too harshly, we must remember what ruthless and utter destruction our own species has wrought, not only upon animals [...] but upon its own inferior races' (9). Bewell argues that Wells offers us a 'double text' with 'the voice of the coloniser disquieted by the voice and experience of the colonised'.<sup>82</sup> Indeed, despite the haunting 'ulla ulla' of the Martians, these colonisers do not have a voice. Rather, Wells encourages critical self-reflection by presenting the British as the victims of foreign subjugation. By placing the narrative within this imperial framework, Wells leaves his text open to further imperial hermeneutics, which render the ending of the novel a poignant critique of the politics of empire. The narrator tells us that the Martians have been 'slain by the putrefactive and diseased bacteria against which their systems were unprepared' (168), an occurrence that had a

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<sup>81</sup> Stephen Arata, 'The Occidental Tourist: *Dracula* and the Anxiety of Reverse Colonisation' *Victorian Studies* 33(1990)4 pp.621-45 (p.623).

<sup>82</sup> Alan Bewell, *Romanticism and Colonial Disease* (Baltimore: Johns Hopkins University Press, 1999) p.xii.



real-world parallel in the plight of native and European people, who were exposed to a plethora of new diseases as a result of the expanding British Empire. This exposure also involved British missionaries, soldiers, and civil servants, who in visiting the colonies, were exposed to 'new' tropical disease aetiologies.

Unlike African sleeping sickness, which was initially thought only to affect the black native populations, diseases like malaria (perhaps the highest profile and most quintessentially 'tropical' of diseases) were still seen, in the 1890s, as linked to the tropical landscape and as more dangerous to the white man than the black. Thus the slaying of the Martians by indigenous pathogens further characterises them as imperial colonisers—their unparalleled 'sanitary science' (128) echoing the substantive claims of western medicine. The transformation of the landscape by the 'tropical exuberance of the red weed' (145) defamiliarises London in ways that evoke reverse-colonisation anxieties and, at the same time, parallel the transformation of colonial spaces by European infrastructures. A reversal of these European transformations is articulated by the early disruption of the railway network in the novel.

The comparatively low temperature of Mars, subject to 'secular cooling' (8), and the Martian's subsequent expansion into warmer climes, constructs a relationship similar to that of the temperate to tropical zone(s), gesturing to the acclimatisation debates of the 1890s and the politics of colonising a new 'world'. References to the complete extermination of the Tasmanians in the British convict settlements (9); comparisons to the Dodos in the Mauritius (34); and the suggested future colonisation of Venus by man (179) all contribute to the conflation of Martian and human identity, a move that perpetuates a critique of

British imperialism, while simultaneously questioning its longevity. The use of imperial models to explore extra-terrestrial threats brings the foreign invader into the purview of epidemiology. Wells's text, in articulating a war between two worlds with starkly different morphologies, analogises the somatic war between man and microorganism and employs thematic frameworks that underscored parasitology and tropical medicine.

### **"A Bug May Bite A Hero": Heroic Survivors, Deadly Parasites, and the Sanitisation of Disease in Fiction**

In his notebook, amid lists of chemical formulas and disease symptoms, Ross had copied out a phrase, probably in an Indian language (the writing most closely resembles Telugu and Kannada, languages predominantly spoken in Southern Indian States), with the English translation: 'A bug may bite a hero'.<sup>83</sup> The context, which appears to be the aetiology of a tropical disease, paints a grim picture: 'Sympt. (1) irritant (2) nervous (3) haemorrhagic. Causes atrophy of liver. Begins with vomiting in a few days + coma.'<sup>84</sup> Thus Ross's addendum appears to comment on the universality of pathology. 'Bug' might refer to parasites, colloquially called 'bugs' by many parasitologists, or to an insect vector. Regardless, the statement implies a universal vulnerability to parasitic disease and invokes it as a framework against which heroism might be wagered—a sentiment that was imported into fiction at the turn of the century. Stories like Joseph Hocking's *The Dust of Life* (1915), John Masefield's *Multitude and Solitude*, and Alice Garland Steele's 'Awake, Thou Sleeper!' (1923), use parasitic disease to

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<sup>83</sup> London, LSHTM. RC. Ross/160/01. Notebooks, 1880-1930.

<sup>84</sup> London, LSHTM. RC. Ross/160/01. Notebooks, 1880-1930.

test, and ultimately reiterate, their protagonists' heroic masculinity. The efficacy of this framework relied on a specific rendering of these diseases, which wilfully ignored the more unsavoury aspects of parasitic infestation.

In 1892, Ross wrote an article for the *Indian Medical Record*, in which he characterised Indian diseases as predominantly 'fevers and bowel and liver complaints'.<sup>85</sup> These ailments, he argued, bore a strange interdependence:

A man gets constipation for some days, then diarrhoea, then hepatic tenderness, then high fever, then diarrhoea again [...] we find the fever [malaria] so frequently preceded by constipation, pain and tenderness of the abdomen, nausea, loss of appetite and even diarrhoea (201).

The significance of abdominal symptoms is here made evident. In post-mortem examinations of kala-azar patients, Ross observed: '200 ankylostomes, 8 ascarides, 12 flukes; also trichnocephalus. Killed by diarrhoea,'<sup>86</sup> again reinforcing the significance of diarrhoea as a key feature of tropical pathology. Mary Kingsley paints a similar picture of tropical morbidity, arguing that 'in addition to malarial microbes, the drinking and washing water of West Africa is liable to contain dermazoic and entozoic organisms'.<sup>87</sup> She goes on to warn against the contraction of a 'wretched family' of skin complaints, as well as eleven common parasitic worms, including *Filaria*. Her graphic description of a filarial worm leading a 'lively existence' in the whites of the eye, travelling under the skin of the nose to 'swarm' with their friends—like Ross's description of diarrhoea and

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<sup>85</sup> Ronald Ross, 'Indian Fevers and Intestinal Sepsis' *Indian Medical Record*, 1 June 1892, p.201.

<sup>86</sup> London, LSHTM. RC. Ross/29/94. Patient Notes, 1898-1899.

<sup>87</sup> Kingsley, p.686.

nausea—is conspicuously absent from fictional representations of tropical disease.

If then, worm infestations, dysentery, and diarrhoea make up so much chronic illness in the colonies, and significantly contribute to deaths via secondary infection, why do they not make an appearance in novelistic accounts of tropical disease? The absence of such graphic symptoms might be a product of what Pamela Gilbert calls a 'Victorian penchant' for euphemism—a discreetness in novelistic accounts of disease that sees cholera, she argues, made synonymous with fever.<sup>88</sup> It seems 'fever' in England is to cholera what 'fever' in the tropics is to malaria; indeed she notes that 'fever' was 'used widely by laypeople as a descriptor for all epidemic diseases, as well as a number of endemic diseases' (135). Despite this catch-all euphemism, Gilbert identifies these fevers as choleric in several mid-to-late century novels, largely from contextual information, such as origin and transmission route. The euphemism of fever then is a flexible motif informed by its geographical and social locations; when in English towns with shared water supplies it signifies cholera, when in tropical regions with marshland it signifies malaria. This picture is complicated by the emergence of malaria as a biomedical metaphor, as discussed in Chapter Three, for a variety of illnesses and physical unease. Thus malaria itself became a euphemism, synonymous with its chief symptom (fever), and emblematic of tropical aetiologies at large. These biomedical metaphors worked to sanitise disease in fiction by providing authors with an uncomplicated plot device that did

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<sup>88</sup> Pamela Gilbert, *Cholera and Nation: Doctoring the Social Body in Victorian England* (Albany: State University of New York 2008) p.135.

not compromise the masculinity of the protagonists with the unsavoury symptoms associated with many tropical ailments.

Sleeping sickness too underwent this euphemistic treatment. However, the fever metaphor in these narratives was largely substituted for lethargy owing to comparisons in both science and literature between the disease's late-stage coma and a deadly sleep. A 1923 short story published in *Quiver* reinforced this metaphor with the title 'Awake, Thou Sleeper!' The story is narrated by a doctor, who recounts the tale of a friend of his, John Chalmers, who went to Africa as a missionary and caught sleeping sickness, but against all the odds recovers. The recovery, which the doctor describes as 'a miracle', is attributed to his steadfast belief in God and his conversion of a wayward woman. Despite dosages of atoxyl, variants of arsenic, and 'a clinical thermometer in one hand and a dose of bluff in the other,'<sup>89</sup> the doctor can not help John, who continues to deteriorate and eventually becomes comatose. However, upon seeing a girl he had met on the steamer over, who prays, for the first time in her life, for him, John makes a sudden recovery—the only explanation given is divine intervention.

In line with other novelistic depictions of sleeping sickness, John's disease takes the form of fever and weakness, sliding into coma. The inflamed lymph nodes, Parkinson-like tremors, and paralysis of late stage sleeping sickness are not depicted, and neither is the inevitable infestation with other tropical parasites like ankylostomes or ascarids—things absent from all the tropical disease novels I've encountered.<sup>90</sup> Arthur Conan Doyle recognises a similar lacuna when

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<sup>89</sup> Alice Garland Steele, 'Awake, Thou Sleeper!' *Quiver* (February, 1923) pp.326-334. (p.329).

<sup>90</sup> John Masefield's *Multitude and Solitude* is an exception to this, with a very realistic account of sleeping sickness that includes enlarged lymph glands. However, as with the other stories, helminths and diarrhoea are conspicuously absent. Notably in every story, sleeping sickness

discussing the use of medicine in popular fiction in his *Round the Red Lamp* stories (1894):

Some [diseases] are worn to pieces, and others, which are equally common in real life, are never mentioned [...] the small complaints simply don't exist. Nobody ever gets shingles or quinsy, or mumps in a novel. All the diseases, too, belong to the upper part of the body. The novelist never strikes below the belt.<sup>91</sup>

The 'small complaints' of the tropics were low-level infestations with helminths, and despite Ross's indictment of bowel complaints in fatalities in the colonies, nobody gets diarrhoea in imperial novels.<sup>92</sup> The function given to tropical diseases in fiction is undoubtedly related to this literary blindness. Sleeping sickness is a case in point—high profile enough to be a political and ideological tool, but rare enough to be a dramatic and mysterious plot device. The disease was a perfect candidate for exploring the politics of empire, and the relationship between science and society. However, the more unsavoury aspects of the disease and its associated ailments often did not fit into the literary aesthetic envisioned by the author. In *With Edged Tools* (1894), sleeping sickness is employed as a somatic judgement and, as a plot device, necessitates the kind of dramatic

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threatens to kill within days or weeks, rather than months or years (see trypanosome in Glossary of Terms).

<sup>91</sup> Arthur Conan Doyle, 'A Medical Document' *Round the Red Lamp, Being Facts and Fancies of Medical Life* (1894; Newcastle-Upon-Tyne: Cambridge Scholars, 2008) p.106.

<sup>92</sup> Masefield's novel again provides the closest thing to this when Lionel makes an oblique reference to dysentery in relation to the death of one of the African bearers in their expedition. However, there is no description of the disease or its symptoms, and it does not visibly affect the western protagonists.

denouement that would not be effected properly by chronic helminth infestation or dysentery. Merriman's framing of the disease as both a racial and moral judgement on a West Indian slave owner relies on its rapid onset and symbolic (and thus simplified) manifestation. Indeed the drama comes almost solely from the slaves' revenge on Durnovo (his graphically mutilated face), and his illness is reduced to its metaphorical namesake—a deadly sleep.

John Masefield's much later novel *Multitude and Solitude* (1909), however, provides a more realistic account of sleeping sickness and in the process problematises the heroic discourse of imperial romance novels—a discourse that is articulated in Ross's aphorism: 'A bug may bite a hero', and was still being explored in novels like Joseph Hocking's *The Dust of Life* (1915). The heroism of Masefield's protagonists, inherent in their mission, is undermined by their bickering, their racism, their cowardice, and ultimately their discovery that other investigators have beaten them to the solution—all of which is attributable to their entanglement with sleeping sickness. In this way parasitic disease acts as a framework within which the characters negotiate their social identities.

Following the realisation that sleeping sickness could affect Europeans and the elucidation of its causative agent, literary depictions of the disease were modified to accommodate white victims—a modification that involved a reframing of the disease and its functions. Earlier stories like *With Edged Tools* (1894) and 'The Adventures of a Man of Science' (1896) employ sleeping sickness as a marker that signifies the victim's immorality, as well as their relationship to a

specific geographical space.<sup>93</sup> Elsewhere, as in Conrad's *Heart of Darkness* (1899), sleeping sickness again takes on a characterisation or world-building role by being confined to background description, and being made synonymous with its medical alternative 'negro lethargy'. However, following its implication in the ill-health of travelling Europeans, it began to gain traction as a fully-fledged literary plot device, distinct from a somatic judgement. *Multitude and Solitude* and *The Dust of Life* are two novels that employ sleeping sickness in this manner, as a more nuanced hermeneutic tool. Lionel and Cedric, both British adventurers, contract the disease whilst on altruistic expeditions—Lionel to find a cure for sleeping sickness, Cedric to help find a lost missionary. Both men are struck down in spite of their racial and moral 'fitness', reinforcing the narrative of the white traveller battling against an African death sentence. This kind of narrative, with its geographical frameworks, served to legitimise palliative imperialism; the characterisation of the British protagonists as heroic in the face of a primitive and dangerous space, further romanticises the imperial encounter.

*The Dust of Life*, in particular, compounds this framing by having protagonist Cedric Essex show his true (and exaggerated) heroism before succumbing to the disease by saving a seventeen-year-old girl from drowning in Cornwall, before travelling to Africa and saving his best friend, first from a lion, then from the depths of a dormant volcano. Indeed by voluntarily descending into the volcano, which Cedric and the indigenous population consider the very

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<sup>93</sup> Durnovo catches sleeping sickness as a direct result of his trading in slaves, suggesting a Karmic punishment, while, for the antagonist of 'Adventures', sleeping sickness is a literal marker of criminality when it becomes evidence of his presence at the scene of the crime. Both men acquire these markers during contact with a specific geographical location.



'definition of Hell',<sup>94</sup> Cedric embodies the classic hero of Greek mythology embarking on a perilous descent into the underworld to save a loved one. Despite this heroism and his leonine physique, Cedric is still bitten by the bug, while the devious Roger Hereford, who had been spreading slander about Cedric since their school days, escapes any and all infections. This mitigates the previously established moral narrative associated with sleeping sickness and reaffirms the patient-disease relationship as that of the individual versus a threat from without: Cedric is attacked by sleeping sickness, despite being in peak physical condition.

The infiltrative powers of trypanosomes are emphasised by Mr Taylor, a missionary doctor, who notes that 'the poison has got hold of him, and it's found it's way into every particle of his body' (107). Despite his almost comatose state, Cedric 'seemed to try to fight with the disease [...] tried to battle with the numbing influence', a struggle that African prince Sunflower deems 'life fighting with death' (112-16). This framing recalls Metchnikoff's theory of phagocytosis and shifts focus away from an out-dated conception of the disease as related to individual karma—the guilt of its victim—and towards a more realistic interrogation of the disease as a biological entity. This shift in focus coincides with the efforts of parasitologists to conceptually separate parasites from bacteria, and so with the anthropomorphism of these organisms in scientific discourse. Admittedly, Hocking's depiction of sleeping sickness still deals in generalities, calling the disease a poison and thus envisaging it as a force rather than an organism. However, the notion of 'life fighting with death' broadly encapsulates this conceptual shift. Moreover, Roger's heroism in *Multitude and Solitude* is directly

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<sup>94</sup> Joseph Hocking, *The Dust of Life* (London: Cassell, 1915) p.96.

linked to Masefield's recognition of the trypanosome parasite as the causative agent of the disease. Roger's fever-bidden hallucinations render the parasite and its tsetse fly vector violent enemies who threaten his bodily integrity.

When Lionel expresses his desire to find out about the life cycle of the trypanosome parasite—'there's a lot which I should like to find out, or try to find out. It's the trying which gives one the pleasure'—Roger responds: 'But I think it's heroic of you [...] it's a heroic thing to do [...] Heroic' (145-46). This assertion links parasitic disease with the professional mythology championed by parasitologists at the turn of the century. Lionel, however, argues that doctors in London face worse things everyday with typhus epidemics. The worst thing about sleeping sickness, he argues, is the loneliness of being in a place where all those around you are dying. Indeed, Roger is later more distressed by the consequences of Lionel dying and leaving him all alone in the African wilderness than by dying himself. The horror of parasitic disease then is not located solely in its biological reality, but rather is in dialogue with its geographical surroundings, and the isolation and 'primitivism' that these surroundings embody. When Roger is isolated during a rain storm, already sickening with sleeping sickness, he notes that: 'his old life was a far-off, inconceivable dream. That he had ever sat by a fire seemed inconceivable [...] That life could be dignified, tender, or heroic seemed inconceivable' (204). The heroism of African exploration is here problematized by the realities of the environment and its pathologies.

Despite this complex handling of the figure of the tropical research scientist, Masefield does go some way to upholding a heroic understanding of the tropical researcher by emphasising, not unrealistic feats of bravery, but the

enormity and danger of the task set for them. This is apparent when Roger thinks of 'the little lonely stations of scientists and soldiers, far away in the wilds, in the midst of the disease, perhaps feeling it coming on, as Lionel must have felt it. They were giving up their lives cheerily and unconcernedly in the hope of saving the lives of others' (154). Masefield connects scientists and soldiers in the fight against disease, which is configured as a common enemy—a framework that ties medicine and imperialism in ways that again parallel the efforts of parasitologists to legitimise their profession. This framework is reinforced by the contents of Lionel's library, stocked almost exclusively with medical and military books. Roger's personification of sleeping sickness, using pathogen and disease metonymically, further compounds his understanding of it as an imperial enemy:

He reviewed his knowledge of sleeping sickness. He thought of it no longer as an abstract intellectual question, but as man's enemy, an almost human thing, a pestilence walking in the noonday. Out in Africa that horror walked in the noonday, stifling the brains of men (154).

Here the visualisation of the pathogen as a living enemy confers greater horror to Roger's conception of the disease, which 'walks in the noonday', a tangible and real threat to man. Moreover, its geographical location—'out in Africa'—demarcates pathology as a reality that structures the imperial encounter.

By providing the potential for recovery, *Multitude and Solitude* (1909), *The Dust of Life* (1915) and 'Awake, Thou Sleeper!' (1923) proffer resolutions to the epidemiological dangers of the imperial encounter. The differing

characterisations of these recoveries reveal much about the understanding of these diseases and their aetiologies. The three novels provide progressively incredulous remedies for the disease: a vaccine, a magical African compound, and a divine miracle. The fictional vaccine involves injection with weakened or dead trypanosomes (an attenuated/inactivated vaccine) followed by injection with blood serum from a naturally immune animal. Pasteur had created the first laboratory vaccine for humans in 1885, against rabies, which was followed by one for cholera (by Waldemar Haffkine) in 1892, and typhoid (by Almroth Wright) in 1896.<sup>95</sup> The serum injection was a method of passive immunisation successfully used by Shibasaburo Kitasato and Emil von Behring in the 1890s to treat diphtheria in humans. Masefield's combination of these methods, while having no direct basis in contemporary research in parasitology, demonstrates an awareness of developing paradigms in immunology. The innovation provides a plausible solution to the problem of sleeping sickness and uses existing protocols, such as experiments with guinea pigs and treatment with atoxyl (an anti-trypanosomal drug discovered in 1905), to confer his text with scientific authority. *The Dust of Life*, published six years later, is less optimistic about scientific research and credits the cure to a naturally occurring African compound, containing a derivative of radium. Its chemical composition almost certainly reflects the radium craze of the early twentieth century, but in doing so suggests that nature, rather than man, provides the cure. Africa is thus characterised as a space that contains both a deadly disease and its miracle cure. The lucrative nature of this cure and its exploitation by a European is perhaps

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<sup>95</sup> Herve Bazin, 'Pasteur and the Birth of Vaccines Made in the Laboratory' *History of Vaccine Development* ed. Stanley Plotkin (New York: Springer, 2011) pp.33-45.

ethically unsound, however the heroic framing of the narrative ensures that this encounter offers support for the imperial project by demonstrating the benefits that colonial interactions can have for western medicine and for 'sporting' British men.

The medicinal powers of the dust of life, although later rationalised by a chemist's appraisal of the compound, are couched in supernatural terms and heavily associated with African prince Sunflower's and British explorer Cedric's Christian epiphanies. Indeed Christianity features heavily in this story, as well as in 'Awake, Thou Sleeper!'—the latter dispensing with a rational cure entirely in favour of Divine intervention. This has the impact of further sensationalising the disease by highlighting man's failure to conquer it alone. Significantly, Masefield's novel, the only one to consciously identify the causative agent, is also the only one to posit a purely scientific solution. While Masefield propounds the new religion of science, Hocking and Steele use disease to reinforce religious authority. Upon recovery both Cedric and John are staunch believers in the wisdom and power of God, crediting a divine power, directly or indirectly, with their fates—a motif also prominent in *With Edged Tools*. Although the inclusion of religion within these stories would appear to negate or undermine the powers of science, in reality these two discourses—of theology and of medicine—were also intertwined outside of fiction.

The religious overtones that parasitic disease originally garnered in helminthological discourse, was modified in these stories, and in late-century scientific discussion, from a discourse of retribution to one of affirmation. While the harsh realities of parasitic disease might challenge God's benevolence, the

prospect of a cure or prophylaxis reaffirmed, for many writers, his power. In Ross's memoirs he narrates his discovery in tandem with his poetic output, and cites poems almost as often as experimental statistics. This confirms the importance of his own emotional understanding of his discovery, which is often couched in religious terms. In the early 1890s his poetry implored a higher power for guidance and lamented his own ignorance:

In this, O Nature, yield I pray to me.  
I pace and pace, and think and think, and take  
The fever'd hands, and note down all I see,  
That some dim distant light may haply break.  
  
The painful faces ask, can we not cure?  
We answer, No, not yet; we seek the laws.  
O God reveal thro' all this thing obscure  
The unseen, small, but million-murdering cause.<sup>96</sup>

His other poems similarly frame the poet-scientist as a figure in need of heavenly guidance: 'I, with eyes upcast/Gazing worn and weary from this Dark World/Ask of thee thy Wisdom, steadfast Eye of God'.<sup>97</sup> Despite his frequent characterisation of God as Death and his frustrations at his seemingly unanswered pleas for help, the end of his famous malaria day poem, 'Reply', reaffirms God's benevolence and

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<sup>96</sup> Ronald Ross, 'Indian Fevers' (1890-3) *Philosophies* (London: John Murray, 1911) p.21.

<sup>97</sup> Ronald Ross, 'The Star' (1890-3) *Philosophies*, p.21.

justifies His hands-off approach in an almost pantheistic conception of Divine omnipresence:

Not when we wait the word,  
The word of God is given;  
The voice of God is heard  
As much from earth as heaven.  
The voice of God is heard  
Not in the thunder-fit;  
A still small voice is heard;  
Half-heard, and that is it.<sup>98</sup>

For Ross, the voice of God is both embodied in and guides science. God's half-heard voice manifests, not in sensational feats of power, but in the discovery of the mosquito vector for malaria and its ameliorative significance for mankind.

The intertwining of science and religion is embedded at a linguistic level in the Ross-Manson correspondence, where they talk about the 'gospel of Laveran' and refer to twelve mosquitoes in glycerine as 'the twelve apostles'.<sup>99</sup> Science and religion are seen, not in opposition, but in tandem, carrying out the same work, and always in dialogue with human endeavour. Like Ross, Masfield in *Multitude and Solitude* invokes the 'new religion of science', summarised as a belief in all that is 'cleanly and fearless' (299). Parasitic disease affirms, in these stories and in the minds of parasitologists, the right of British intervention in the colonies by

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<sup>98</sup> Ronald Ross, 'Reply' (1897) *Philosophies*, pp.53-54. (p.54)

<sup>99</sup> Patrick Manson, 'Letter 32 02/011' *The Beast in the Mosquito*, pp.92-93. (p.92).

demonstrating the success of palliative imperialism—a venture underpinned by religious ideologies. The civilising mission is here indelibly embedded in the triumph of man over nature, in his conquest of tropical disease; the Christian epiphanies of Cedric, in *The Dust of Life*, and Madeleine, in 'Awake, Thou Sleeper!', confirm this relationship by connecting, directly or indirectly, Christianity and moral righteousness with recovery from disease. The 'heroes' of the novels are all 'bitten by the bug' (the stories all contain mention of the tsetse fly vector) but owe their recovery not to strong immune systems, but to the faith and altruism of others. That said, the divine interventions of *The Dust of Life* and 'Awake, Thou Sleeper!' do not neutralise the threat posed by parasites or the anxiety articulated by Masefield's depiction of the parasite-vector-host relationship as overtly traumatic. Rather, these interventions propagate the dialogues between scientific and religious authority that we encountered in early helminthological discourse and strengthen the perceived antithesis between man and nature.

### **Vampires as Vectors: the cultural response to changing paradigms of disease transmission.**

She had suffered rather severely from the mosquitoes before Christmas—and had been almost frightened at finding a wound upon her arm, which she could only attribute to the venomous sting of one of these torturers [...] "He has caught you on the top of a vein. What a vampire! [...] You must always show me any bite of this nature. It might be dangerous if neglected. These creatures feed on poison and disseminate it."<sup>100</sup>

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<sup>100</sup> Mary Elizabeth Braddon, *Good Lady Ducayne* (1896; Whitefish: Kessinger, 2004) p.15.



In Mary Elizabeth Braddon's 1896 short story 'Good Lady Ducayne', a young girl called Bella travels to Italy as a companion to an aristocratic woman of uncommonly old age and is there subject to a mysterious illness. Her increasing weakness is attributed to the bites of mosquitoes, which Dr Parravicini insists are preying on her at night. In the passage I have quoted above, he characterises the mosquito as a 'vampire' owing to its extraction of her blood and further suggests that the insect might disseminate poison. The story later reveals that it is Dr Parravicini himself who is the culprit, dosing Bella with chloroform before extracting her blood for his scientific experiments to prolong Lady Ducayne's life. Despite this *dénouement*, it is significant that the doctor attributes her illness to what just one year later would be proven to be the transmission route of one of the most high profile diseases of the British Empire, and of particular significance to Italy where it too abounded, prompting one lady to write to Ross asking him to 'exterminate the mosquito in Venice! That paradise that is to me an inferno.'<sup>101</sup> The recognition of the dangers of the mosquito as vector is inherent in Dr Parravicini's insistence that it 'feed[s] on poison and disseminate[s] it', suggesting not simply a venomous sting, but an acquired pathology that is then transmitted to others.<sup>102</sup> Of course the relations between mosquitoes and blood sucking are overt and thus their comparison to vampires is unsurprising; however the *lexis* of blood sucking and disease transmission reveals something more interesting about the status of parasitological theorems in the public sphere.

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<sup>101</sup> London, LSHTM. RC. Ross/119/25. Lillian Glenny to Ross, 16 Aug 1913.

<sup>102</sup> The theory of the mosquito transmission of malaria has a long history, and thus Braddon's articulation of this theory, and of the mosquito as vector is not antithetical, but rather highlights the pervasiveness of this theory in the public sphere.

The protozoan parasite responsible for malaria, *Plasmodium spp*, was discovered by Laveran in 1880, laying waste to erroneous claims made by Klebs and Thommasi-Crudeli for the bacillary origin of the disease in 1879. However the two theories persisted—until Ross's experimental proof—in tandem, propagating belief in multiple transmission pathways: direct person-to-person contact, transmission by soil, water, air, or intermediate or vector host. The vector theory was gaining traction owing to Manson's discovery of the mosquito vector for the parasitic disease filariasis in 1877, as well as a plethora of American, French, and English physicians who forwarded the theory in relation to malaria.<sup>103</sup> However, competition was fierce, with many believing in a bacterial agent contained in soil and water. The battling of these medical models might be read in another vampire story: Bram Stoker's *Dracula*, which makes prominent use of vectorism in conjunction with the aesthetic use of a variety of other, secondary modes of infection. Published in 1897, Stoker's eponymous story is structured around, and driven by, narratives of contagion, that speak to not just parasitic theories of disease transmission, but also wider debates concerning miasmatism, contagionism, and vectorism at large.

In his article "'The Invisible Giant': *Dracula* and Disease', Martin Willis points out that recent criticism of *Dracula* has largely ignored the direct significance of the disease motifs at the forefront of the novel, opting instead to interpret these motifs as metonymic and metaphoric signifiers of other Victorian anxieties regarding sexuality, gender, and fantasies of desire. He subsequently argues in favour of Stoker's conscious engagement with epidemiological ideas,

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<sup>103</sup> See: William C. Gorgas and Fielding H. Garrison, 'Ronald Ross and the Prevention of Malarial Fever' *Scientific Monthly* 3(1916)2 pp.132-50.

citing his exposure to medical knowledge through family members and experimentation with the imaginative potential of disease in his earlier works, as evidence of his 'recognition of the roles that disease theories might play in contemporary Britain'.<sup>104</sup> Stoker's exploration of the competing theories of miasmatism and contagionism in both his 1882 short story 'The Invisible Giant' and in *Dracula* demonstrate his interests in the medical and political implications of competing understandings of disease and their relationships to the social body. The recently popularised germ theory, which attributed disease to living organisms, added a further poignancy to *Dracula*, which Willis argues demonstrates the intertwining of miasmatism's version of sanitary science and germ theory. While Willis convincingly demonstrates the collapsing of boundaries between these discourses, observable in scientific treatise and in Stoker's text, I would further suggest that *Dracula* offers us a version of disease that is overtly parasitic in nature, and that speaks to anxieties concerning tropical disease and its transmission.

In dialogue with Stephen Arata's reading of *Dracula* as embodying an anxiety about 'reverse colonisation' borne of the 'geopolitical fears of a troubled imperial society' and 'cultural guilt',<sup>105</sup> Count Dracula might be read as a biomedical metaphor, in line with Rohan Deb Roy's understanding of malaria. In his travel from Transylvania to England, Dracula parallels the translocation of parasitic disease from the colonies to Britain, the impact of which was being registered daily in the bodies of returned traders, soldiers, and missionaries at the

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<sup>104</sup> Martin Willis, "'The Invisible Giant': *Dracula* and Disease' *Studies in the Novel* 39(2007)3 pp.301-25. (p.304).

<sup>105</sup> Stephen Arata, 'The Occidental Tourist: *Dracula* and Reverse Colonisation' *Fictions of Loss in the Victorian Fin de Siècle* (Cambridge: Cambridge University Press, 1996) pp.107-32. (p.108).

Royal Victoria Hospital, Netley, and Seaman's Hospital, Greenwich, in the 1890s. Thus, symbolising a foreign epidemiological threat, Dracula is representative of a plethora of imperial anxieties related to disease transmission in the colonies, and its resultant associations with geography, class, superstition, and sanitation. In his fluid morphology (a metaphor for the plurality of disease transmission) he symbolises both tropical pathology and its arthropod vector. He seamlessly parallels the mosquito vector of malaria, drawing blood from his victims in a physical parasitism, in addition to infecting them with vampirism as a blood disease. Indeed, malaria and vampirism share kindred symptomologies, both giving rise to cyclic fevers and anaemia. Lucy's somnambulism and Dracula's nightly visits mirror the mosquito's elevated nocturnal activation.<sup>106</sup> When Lucy's mother removes the garlic flowers from Lucy's room and opens the window in a bid to sanitise the air, unwittingly facilitating Dracula's entry, she, in the same motion, provides access for mosquitoes. The morphological similarities between the proboscis of the mosquito and the vampire's fangs, provides the most striking indictment of their confluences, supporting the imaginative pairing of vampires and insect vectors. These characteristics are, of course, not unique to *Dracula*, and thus I would further suggest that the vampire as archetype owes something to the explication of disease phenomena generally, and in particular, to attempts to understand vector-borne blood diseases before there existed a linguistic and conceptual framework within which to talk about them.

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<sup>106</sup> Even excluding the mosquito theory of transmission, malaria had been associated with the night by Dr John Mitchell in 1849, who wrote: 'whatever may be [the] cause [of malarial fevers], it seems to have activity almost solely at night. *Darkness* appears to be essential to either its existence or its power'. J.K. Mitchell, *On the Cryptogamous Nature of Malarious and Epidemic Fevers* (Philadelphia: Lea and Blanchard, 1849) p.51.

Many prophylactics designed to abate mosquitoes are also levied against the vampires of folklore. Garlic, for example, famously odious to the vampire, is also an old remedy to stave off mosquitoes, and was used to ensure the general health of the individual, as the author of *Doctoring Begins at Home* notes in 1855: "The walls should be painted; or papered with a good sound paper, pasted down firmly with size, scented over the fire with black pepper, aloes, or garlic, which M. Raspail terms the "camphor of the poor".<sup>107</sup> This connection is a sensible one as garlic is an astringent with antibacterial properties, so would indeed help fight infection, in addition to staving off mosquito (or vampire!) bites. Garlic is also an anti-pyretic, helping to reduce fever—a symptom of malaria among other tropical diseases—and a vermifuge, prompting the expulsion of parasitic worms.<sup>108</sup> Hence the application of garlic to vampires links them physiologically to the mosquito and to intestinal parasites; one might even go as far as to suggest that the vampire as a figure might have originally been constructed in an attempt to explain such pathologies, given that these therapeutic uses of garlic were known since at least the first century AD. The visceral aversion of vampires to religious imagery, and the use of the crucifix or holy water to counteract them, might correspond to the belief that disease generally, and particularly parasitic disease, was a result of divine disfavour, as discussed in chapter one. Folklorist Paul Barber identifies the use of such stories by preindustrial societies to interpret phenomena associated with death and the decay of corpses. He writes that although incorrect, these theories are 'usually coherent, cover all the data, and provide a rationale for some common practices that seem, at first, to be

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<sup>107</sup> 'Doctoring Begins at Home', p.674.

<sup>108</sup> Manuchair Ebadi, *Pharmacodynamic Basis of Herbal Medicine* (Boca Raton: CRC Press, 2002) p.537.

inexplicable.<sup>109</sup> It seems possible then that vampire myths were originally used to explain epidemic disease, particularly the impact of disease on several members of the same family. Moreover, as a member of the undead, the vampire embodies the transferral of pathogens from dead to living bodies, invoking an awareness of the dangers posed by infected corpses.

In the late nineteenth century, vampire stories, gaining popularity in England, were increasingly being exposed to the 'cold scrutiny of science,'<sup>110</sup>—a phenomenon that brought to light the vampire archetype's connections to disease. John Polidori's 1816 short story 'The Vampyre: A Tale' and Joseph Sheridan Le Fanu's 1871 novella *Carmilla* demonstrate this shift in signification, the latter rekindling the vampire's original symbolism in reverse. Le Fanu uses disease as an explanation for vampirism, rather than the other way around, recognising, in the process, the significance of this hermeneutic pairing. Le Fanu's story is framed as the case study of a doctor, which places *Carmilla*'s vampirism within the lexis of disease. Unlike John Polidori's earlier 1816 story 'The Vampyre: A Tale', Le Fanu categorises vampirism as a euphemistic illness. Polidori's vampire attack is sudden and final, not indulging in the drawn out parasitism of Stoker and Le Fanu. Although Aubrey is 'seized with a most violent fever,'<sup>111</sup> it is due to his shock at seeing Ianthe's body, not as a result of the vampirism of Lord Ruthven. *Carmilla*, on the other hand, is herself characterised as one under the influence of illness, being bodily languid and suffering from

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<sup>109</sup> Paul Barber, *Vampires, Burial and Death: Folklore and Reality* (Bingbamton: Vail-Ballou Press, 1988) p.1.

<sup>110</sup> Carol. A. Senf, *The Vampire in Nineteenth Century English Literature* (Bowling Green: Bowling Green State University Popular Press, 1988) p.22.

<sup>111</sup> John William Polidori, 'The Vampyre: A Tale' (London: Sherwood, Neely and Jones, 1819) p.49.

bouts of sudden weakness. Laura describes how Carmilla 'trembled all over with a continued shudder as irrepressible as ague,'<sup>112</sup> using malaria as an explanation for her adverse reaction to a funeral hymn. She further explains the death of Carmilla's victims as a result of 'plague or fever' (32) or 'a mysterious disease' (43) and attributes the strange instances of vampirism reported by the victims to feverish hallucinations. This does much to conflate vampirism with disease. The vampire in the late nineteenth century was a figure that self-consciously played on its connection to disease in order to articulate wider social concerns. Stoker provides a distinctly medicalised version of the metaphor, which further collapsed the boundaries between disease and the vampire by pitting the latter against the expertise of a physician, and in the context of overseas travel. In this way Stoker's novel is strikingly 'of its time', articulating, consciously or otherwise, the epidemiological anxieties of imperial Britain in the 1890s.

My contention that Stoker's vampire too is associated metaphorically with malaria, and metonymically with the mosquito, is strengthened by its acknowledged debt to *Carmilla*,<sup>113</sup> which, as I have already highlighted, utilises pathological terminology to frame its depictions of vampirism. Indeed, Le Fanu's lexis of fever offers a specific reference to malaria when Laura and Carmilla are discussing the efficacy of a charm, which Carmilla medicalises by explaining that 'it has been fumigated or immersed in some drug, and is an antidote against the malaria' (48). *Dracula* also invokes this frame of reference by upholding a version of vampirism congruent with the symptomology of a parasitic disease

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<sup>112</sup> J. Sheridan LeFanu, *Carmilla: A Critical Edition* ed. Kathleen Costello-Sullivan (1871; Syracuse: Syracuse University Press, 2013) p.32.

<sup>113</sup> Joseph Bierman recognises this debt in the original placement of Castle Dracula in Styria. This was later rewritten. See: Joseph Bierman, 'The Genesis and Dating of *Dracula* from Bram Stoker's Working Notes' *Notes and Queries* 24(1977) pp.39-41.

transmitted by a biting insect: small puncture wounds on the body, followed by fever, weakness, and anaemia. Indeed, Stoker's vampire, symbolising both the arthropod vector and the disease itself, embodies a variety of transmission pathways distinctive to parasitic infections, with particular relevance to the debate concerning the transmission of malaria. While Dracula's chief mode of infection is through biting, he also embodies malaria's miasmatic namesake by infiltrating rooms in a white mist: 'the mist grew thicker and thicker and I could see now how it came in [...] pouring in, not through the window, but through the joinings of the door.'<sup>114</sup> Here the mist infiltrates British domestic space in an articulation of reverse colonisation that conflates disease with a threat to personal (Mina's) and architectural (the building's) integrity. Such an infiltration ultimately bespeaks an anxiety concerning the dangers of malaria to British nationhood—malaria being one of the biggest obstacles to British trade, commerce, and life in the colonies.

Charles Gerhardt's discovery in 1884 that malaria could be transmitted directly from person to person via the blood further strengthens the aesthetic associations of vampirism with malaria in Stoker's novel. Indeed the contention that it was the blood of the malaria patient, not his breath (as previously believed) that was infectious<sup>115</sup> highlights Stoker's engagement with theories of disease transmission. Dracula's force-feeding of Mina articulates this transferral of infection in the blood, a motif that is also upheld by Lucy's ameliorative blood transfusions from Arthur Holmwood, who has 'blood so pure that [they] need not

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<sup>114</sup> Bram Stoker, *Dracula* (1897; London: Simon & Schuster, 2014) p.304.

<sup>115</sup> London, LSHTM. RC. Ross/103/06/50. 'The Practice of Malarial Prevention'; Irwin. W. Sherman, *The Malaria Genome Projects: Promise, Progress and Prospects* (London: Imperial College Press, 2012) pp.5-6. Dracula's rank breath is perhaps also significant in characterising him as a vehicle for disease.



defibrinate it' (143). Although critics often read this as an endorsement of Holmwood's superior class pedigree, it could equally refer to the absence of erythrocytic pathogens, a medical preoccupation ascertained earlier in the novel when Van Helsing examines a sample of Lucy's blood microscopically. Dracula's association with small animals and vermin—'the brute beasts which are to the Count's command [...] these rats that would come to his call' (297)—evokes the parasitic life cycle (which often involves intermediate hosts) and semantically connects him with the 'lower' animals, compounded by Jonathan Harker's physiognomic analysis of him earlier in the novel. His insistence on carrying around the soil of his homeland as a precondition for his success provides reference to the belief that malaria was resident in the soil of malarious locales. Stoker's choice to prioritise some aspects of vampirism, while rejecting others, reveals his use of disease as a hermeneutic framework.

Stoker, while retaining and amplifying many aspects of Le Fanu's novella, chose to move the threat of the vampire closer to home. Although Carmilla's victim Laura is half British, and she and her British father (her mother is dead and absent from the narrative) continue to speak English and drink tea, 'the national beverage' (20), Le Fanu's novella is set in Styria, and many of the victims are foreign. Stoker, however, relocates his vampire, who originates in the East, but travels to the West, and so becomes a direct threat to, not just British persons, but British nationhood. This places the novel within the purview of British imperial anxiety. Dracula's use of the sea to travel to England, arriving at Whitby on the ship the *Demeter*, plays out the carriage of parasitic disease on ships from the colonies to England. The unseen transmission of tropical disease was a source

of biological and social anxiety, with British physicians at home and abroad woefully under-equipped to deal with these foreign and unfamiliar aetiologies, as we have seen in chapters two and three. The inability of physicians to effectively treat pathogens met with in the colonies, led to calls for a specialist school dedicated to research and training in tropical medicine.<sup>116</sup> This prompted the foundation of the Liverpool School of Tropical Medicine in 1898 by ship owner Sir Alfred Lewis Jones, and the London School of Tropical Medicine in 1899 by Sir Patrick Manson. In a similar manner, the 'transmission' of Dracula to Whitby and his subsequent attempts to spread vampirism, prompts the foundation of the 'Crew of Light' to vanquish him, comprising scientifically minded men of Western origin.<sup>117</sup> Western science is employed in both cases in an attempt to conquer Eastern disease, and so Stoker imaginatively answers the calls voiced by British physicians and traders. Thus, the novel can be seen as a product of the imperial anxieties that Arata identifies, and of the shifting paradigms of disease transmission, which were being debated by parasitologists in relation to non-European pathologies.

The difficulties that the Crew of Light face when attempting to satisfactorily vanquish Dracula perhaps reflect the perceived enormity of the task facing imperial physicians. Although ultimately successful, our protagonists do not embody the heroic masculinity that would characterise later discourses on parasitology. This undermines, to some extent, the authority of western medicine. The narrative, too, allows for Arata's notion of imperial guilt in the figure of Jonathan Harker, who facilitates Dracula's infiltration of England with a business

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<sup>116</sup> See: 'Ignorance of Tropical Diseases', pp.1491-92.

<sup>117</sup> The foundation of the Crew of Light conceptually parallels the 'knights of science' rhetoric being expounded by parasitologists, which I discussed in chapter two.

transaction that resembles imperial exploitation. Desiring Dracula's money and patronage, Jonathan unwittingly provides the Count with the means to enter and threaten English society. He is blinded by a desire for advancement, 'rooted in a dubious moral economy of superiority over the foreigner and his culture.'<sup>118</sup> This perceived superiority is borne of the imperial conflation of illness and savagery, a point of reference reinforced by Jonathan's mapping of Transylvania, which he identifies as a land of superstitions, where the people are simple, and goitre is 'painfully prevalent' (8). Goitre—a swelling in the neck resulting from an enlarged thyroid gland—is probably meant as a reference to Dracula's predation on the local population. However, it is also congruent with theories concerning parasitic disease, given the view held by some physicians in the 1890s that goitre was caused by a blood parasite.<sup>119</sup>

Dracula's presence in that region contributes to the indigenous population's seemingly superstitious, but functionally prophylactic behaviour, in a dynamic that resembles the Indian superstitions regarding malaria that kept them away from swamps, and thus from mosquitoes. Willis points out that Jonathan's disregard for Dracula's domestic advice, and refusal to observe his warning that 'Transylvania is not England. Our ways are not your ways',<sup>120</sup> precipitates his incident with the three vampire women, symbolic of his infection with a disease for which he has no natural immunity (318). This echoes British physicians' dismissal of indigenous medical practices as superstitious and un-empirical. Ross frequently discussed the superstitions of the indigenous population, and how these were transferred to British travellers, some believing

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<sup>118</sup> Willis, p.319.

<sup>119</sup> See: e.g. 'A Haematozoan in Goitre' *British Medical Journal* 2(1898)1969, p.915.

<sup>120</sup> Stoker, p.25.

that malaria was caused by: 'the innocent evening mist',<sup>121</sup> by forgetting to say their prayers, or even by eating pineapples.<sup>122</sup> He also admitted that 'medicine in India [was] antiquated, vicious and ignorant' with Britain's own medical men 'absolutely ignorant of the elements of tropical disease'.<sup>123</sup> However, this is more a criticism of the British and Indian systems of governance than the indigenous inhabitants, who Ross admits rightly believed, in some parts of Africa and Assam, that mosquito bites cause fever.<sup>124</sup> He also gave credit to his Indian assistant, Mahomed Bux, for his mosquito finding technique, arguing that the British Museum knew nothing about Indian mosquitoes.<sup>125</sup> The Transylvanian peoples' choices to wear crucifixes and not venture out after dark (techniques Van Helsing later himself employs) certainly help stave off the vampire, thus Harker's choice to ignore such advice mirrors the arrogance of a Western medical authority that had little or no understanding of the pathologies it professed to treat.

In allegorising Britain's apprehension concerning tropical diseases, Stoker's text broaches both the professional politics of medicine in the colonies, and the cultural assumptions that helped to frame it. The authority of Western sanitary science, represented imaginatively by the Crew of Light, is challenged by a theory of disease transmission constantly in flux. The aetiological mystery of malaria is expressed in Dracula's multiplicity, his environmental connections

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<sup>121</sup> Ronald Ross, *Malarial Fever, its Cause, Prevention and Treatment* 9th edn. (Liverpool: Liverpool University Press, 1902) p.15.

<sup>122</sup> London, LSHTM. RC. Ross/78/01. Clipping: 'Major Ross and the Lagos Chamber of Commerce' *The Lagos Weekly Record*, 3 August 1901. n.p.

<sup>123</sup> Ross, *Memoirs*, p.285. Ernest Hart had also attacked the Indian Medical Service in an article in 1895, see: 'Medical Research in India' *British Medical Journal* 2(1895)1808 pp.448-89.

<sup>124</sup> London, LSHTM. RC. Ross/17/03. Ross to George Nuttall, 31 October 1898.

<sup>125</sup> London, LSHTM. RC. Ross/17/07. Ross to George Nuttall, 28 April 1899. Ross asks Nuttall to give credit to Bux when his research is published: 'if you are publishing anything soon, please give these facts (that is if you think it worthwhile and they have not been published before). But give the credit (of finding the fact of the larvae floating flat) not to me, but to Mahomed Bux.'

drawing attention to the mammoth task of controlling his (and malaria's) influence, as well as providing room to explore the instability of what Alan Bewell calls 'medical geographies'.

Bewell argues that medical geographies—the making and unmaking of national and cultural identities' as mediated by ideas about disease—played a fundamental role in the construction of 'foreignness'.<sup>126</sup> These geographies, which pathologised colonial landscapes, sought to uphold boundaries between Britain and her colonies by identifying the properties that precipitate these illnesses as intrinsic to these foreign landscapes. However, the recognition that other factors such as hygiene and sanitation played a part in disease transmission challenged these dichotomies. Bewell argues that the 'tropics' underwent a cultural transition that redefined the term as a marker, not of climate, but of social, biological, and medical otherness, which the British used to construct and understand their own biomedical identity (18). The emergence of tropical medicine compounds this 'otherness' by separating so-called 'temperate diseases' from diseases of warm climates, as I discussed in chapter three. However, the increasing similarities being drawn between these othered landscapes and metropolitan spaces exposed an underlying anxiety about the validity of this dichotomy. This was impressed on the public imagination by publications like William Booth's *In Darkest England and the Way Out* (1890), which invoked Henry Morton Stanley's *In Darkest Africa*, and drew parallels between the jungles of Africa and the slums of England. Booth writes: 'the foul and fetid breath of our slums is almost as poisonous as that of the African

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<sup>126</sup> Alan Bewell, *Romanticism and Colonial Disease* (Baltimore: Johns Hopkins University Press, 1999) pp.17-18.

swamp',<sup>127</sup> an observation that radically pathologises metropolitan spaces, but at the same time seeks to retain a sense of geographical difference with the adverb 'almost'.

The anxiety embodied in these parallels is recognisable in Stoker's novel, which takes on particular significance when one considers the foreign and imperial nature of Dracula's threat. Stoker characterises Dracula's London refuges as miasmatic, and in doing so, enters into a dialogue that considers the interrelations between competing theories of disease transmission.<sup>128</sup> The germ theory that emphasised the transmissibility of living pathogens, and the miasmatism that stigmatised whole landscapes, here coexist in an imagining of disease that dramatises its impact on social identity. The pathologising of Dracula's London residence 'Carfax' speaks to the perceived dangers of colonial immigration and to the othering of the metropole. This is a two-pronged anxiety about the social 'tropicalising' of English spaces and 'the spreading back of [disease organisms] from Europe's colonies to its metropolitan centres.'<sup>129</sup> Dracula represents both the dangers of translocated aetiologies and the infectious 'want of civilisation' that David Arnold identifies as underpinning Manson's understanding of the 'tropical' ideologue.<sup>130</sup> However, more than this, the miasmatic environment of Carfax, which supports and facilitates the Count's presence, becomes synonymous with the specific conditions in the colonies that were said

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<sup>127</sup> William Booth, *In Darkest England and the Way Out* (1890; London: Charles Knight, 1970) p.14.

<sup>128</sup> Martin Willis, pp.313-14.

<sup>129</sup> Rod Edmond, 'Returning Fears: Tropical Disease and the Metropolis', p.193.

<sup>130</sup> He argues that for Manson, 'tropical signified not just a discrete set of diseases, but also the want to civilisation evinced by their presence'. David Arnold, 'The Place of 'the Tropics' in Western Medical Ideas Since 1750' *Tropical Medicine and International Health* 2(1997)4 pp.303-13. (p.305).

to support the proliferation of germs, parasites, and insect vectors. These conditions, identified at an estate near Purfleet, then, are either bred by Dracula's presence there, or as Martin Willis argues, are already within England, ready to support the imposition of disease. The inherent similarities between Carfax and Castle Dracula in Transylvania shun the healthy/diseased categories proposed by medical geography, and instead call for the widespread implementation of sanitation and hygiene practices that combat both microbes and the conditions that support their proliferation. Given Dracula's confluence with an arthropod vector, I would argue that his association with miasmatic environments reflects a bionomic nuance that recognises the ways in which such environments support parasites and their hosts. Ultimately, Dracula's biggest threat lies in his ability to challenge the integrity of Britain and her borders, to create 'an ever-widening circle of semi-demons to batten on the helpless in London' (60). The pairing of vampires and vectors thus illustrates the imaginative power of tropical pathology. Stoker undoubtedly recognised the historical use of the vampire motif to talk about disease and its significance to the emergence of the vampire as a social metaphor. However, I argue that, rather than simply using the vampire to talk about disease, Stoker uses the complex lexis of disease and its transmission via vectors to endow the vampire archetype with greater horror.

## Conclusion

I don't fancy the name Plantation Parasitoscope; why not "Planter's Microscope"? He can use it for any purpose. If you give it too special a name wags will make fun of it—call it shitoscope and the like—as is the way with the facetious griffin.<sup>1</sup>

This advice from Patrick Manson, written in a letter to Ronald Ross in February 1900, humorously, but succinctly, illustrates the disparity between Ross's idealism and the reality. He longs to leave a legacy, and in doing so strives to emblemise the significance of parasitology as a medical discipline distinct from bacteriology. His suggestion for his new microscope—as a man obsessed with modifying and improving existing apparatus—demonstrates this by suggesting that the methodological differences between bacteriologists and parasitologists require distinct equipment.<sup>2</sup> However, his insistence on terminological specificity leaves him open to ridicule. As Manson observes, critics would not forgive such a pedantic designation. The romantic outlook that characterised Ross's narrativisation of parasitology research is encapsulated here, a rose-tinted lens that the editor of the *Abolitionist* recognised when he criticised Ross's petition to the government in 1914. Ross had petitioned the government to ask for more financial recognition for himself and other scientific researchers. The editor of

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<sup>1</sup> Patrick Manson, 'Letter 191 49/050' *The Beast in the Mosquito*, pp.427-28. (p.427).

<sup>2</sup> The microscope in question is probably Ross's diagnostic microscope, which he invented circa 1897. However, this is evidently an exercise in self-aggrandisement, given that, as Manson notes, the microscope could have been used for detecting any microscopic pathogen, not just a parasite!



the *Abolitionist* directly attacked Ross's integrity, using his poetry to draw attention to this narrativisation. His famous malaria day poem was reprinted at the beginning of the article, with the comment: 'thus sang Sir Ronald Ross on the day when he discovered the alleged causal organism of malaria in the stomach of the mosquito. Or rather thus he imagined himself singing, when sitting down some time afterwards to court the poetic muse.'<sup>3</sup> This cutting observation regarding Ross's carefully crafted public image sought to undermine his integrity as a scientist and as a public figure. Speaking on behalf of The British Anti-Vivisection Society, the editor asserted that they were 'inclined to think that the expenditure of "tears and toiling breath",' mentioned in the poem, 'must have been less over the discovery of the parasite than over the production the verses', an accusation that drew attention to the self-consciousness of the parasitology narrative.

Ross was consumed by the desire to control the critical reception of his research, a preoccupation that is most apparent in his archives, which were bequeathed to the London School of Hygiene and Tropical Medicine, and were collated and catalogued by Ross himself. Despite his efforts to appear impartial, securing, in many instances, signed testimonies from the recipient on the authenticity of their correspondence, his efforts to frame the history of parasitology and his role within it is startlingly apparent. In his memoirs he voiced the desire to demonstrate the 'sacred passion for discovery' (11) that leads to scientific breakthrough and this, if anything, shines through. Indeed, the desire to tell his own story appears greater even than his desire to romanticise the

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<sup>3</sup> 'The Poet's Inspiration' *Abolitionist* 6(1914)15 pp.126-28. (p.126).

venture; his archives, containing a diverse wealth of material from all aspects of his life (approximately 19,000 items), do not appear to exclude the more unsavoury aspects of his working relationships with other researchers.

His ultimate disillusionment with the public's and government's reception of the mosquito-malaria discovery is in some ways a product of his own idealistic narrative of imperial romance. Again this disparity between his fantasy about the role of science in society and the reality left Ross with a bitter taste in his mouth, leading him to include a thinly veiled reference to his own experiences in a letter campaigning for a British Nobel prize in the *British Medical Journal* in 1906:

Frequently—and this has especially been the case in pathological work—he [the discoverer in science] has not been paid at all for making his researches [...] when by persistent and sometimes, to him, ruinous effort he does succeed, does he this take refuge behind a law of patents or copyrights and thus recoup himself for his labours? No; the gold, which he has discovered he gives away freely to the whole world. He himself may profit little or nothing by his great service to humanity [...] often thwarted and restricted by his circumstances, is frequently condemned to see the bulk of credit pass to others who have merely, perhaps, given an easy finish to his researches, or have written them up in an unscrupulous manner.<sup>4</sup>

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<sup>4</sup> 'A British Nobel Prize' *British Medical Journal* 2(1906)2397, pp.1667-68 (p.1667-68).

Still bitter, in 1924, regarding his public priority disputes with Giovanni Battista Grassi, Ross noted in letter correspondence with the editor of *Nature*, Sir Richard Gregory, that he 'bitterly regretted that [he] ever spent a moment on the investigation of diseases in the service of humanity,' insisting, rather melodramatically, that 'humanity [was] not worth it.'<sup>5</sup> He was invited to give numerous public lectures and to write articles, including an invitation to update the 1924 edition of *Chamber's Encyclopaedia* with a popular account of the malaria discovery, to publish an article on malaria in *Wireless Review and Science Weekly* (with an anticipated sale of 120,000 copies), and to give a BBC lecture—broadcast to an audience of over a million. Nevertheless, Ross insisted that the public were ignorant of his efforts and clueless about malaria prevention, charges that seem somewhat unlikely. His preoccupation is not, despite his protestations, with 'trying to get the British public to use [his] discovery', or even with lamenting the public's 'lack of interest in scientific achievement [and] fail[ure] to realise the wonderful benefits to be obtained from such epoch-making discoveries in medical science,'<sup>6</sup> but rather it is with forcing the public to recognise, financially, the wonderful benefits of Ross, the man.

Likewise, the fictions produced by and about parasitologists,<sup>7</sup> by and large, supported the fantasy of the lone researcher or specialist fighting against nature. The archetype of the scientific detective, when paired with tropical disease, took part in a reciprocal relationship, which endowed both parties with further

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<sup>5</sup> London, LSHTM. RC. Ross/150/02/01-04. Ross to Richard Gregory, 29 February 1924.

<sup>6</sup> London, LSHTM. RC. Ross/150/02/01-04 Norman Edwards, editor of *Wireless Review and Science Weekly*, to Ross. 29 May 1923.

<sup>7</sup> By which I mean to refer to both the highly politicised literary narratives of parasitologists produced as part of their cultural and professional identities, and to those works of fiction produced during this fifty-year period that featured parasitic disease.

potency. In being subject to the detective's gaze, tropical disease in these fictions is actively associated with its analogue: crime. However, it inhabits a relatively unique position, given its function as a marker of past imperial encounters. Significantly, in detective fiction, tropical diseases are associated with violence and problems of identity. In 'The Adventures of a Man of Science, IV—The Sleeping Sickness', parasitic disease reveals the identity of the murderer; in 'The Adventure of the Dying Detective' its counterfeit (in the form of Holmes' malingering) does the same; while in *The Mystery of 31 New Inn*, the unlikely initial diagnosis of sleeping sickness alert Jervis and Thorndyke to the possibility that there is a murderer to identify in the first place.

This relationship between tropical disease and social identity is also evident in adventure romance fiction. Sleeping sickness in *With Edged Tools* is used to make abject Victor Durnovo and compound his villainy, while its failure to infect Jack Meredith and Guy Oscar mark them as racially and morally superior. In *The Dust of Life*, sleeping sickness plays a pivotal role in determining the public reception of Cedric Essex, and in *Multitude and Solitude* it forces Roger Naldrett to reconsider his career as a playwright and to interrogate the institutions that underpin the modern social world. These fictions, in subscribing to something like the imaginative fantasies of parasitologists, shift focus from the diseases themselves to those identifying them, in a move that highlights the significance of disease and its elucidation to understandings of selfhood. Priority in the mosquito-malaria discovery is so important to Ross because he derives his personal and professional integrity directly from it. This is what is implicit in comments like the one made by the editor of *Wireless Review and Science Weekly*, who noted that

an article to enlighten the public about the power of scientific achievement would do quite a lot of good, 'especially coming from [Ross's] pen'.<sup>8</sup> His identity as a British Nobel laureate, who furthered British imperial dominance by making 'habitable areas aggregating in size to a third of the world'<sup>9</sup> is a carefully crafted narrative that exposes the dialogic relationship between medicine and nationhood at the fin de siècle. The tying of Ross's research to 'empire-building',<sup>10</sup> by parasitologists and laymen alike, is demonstrative of a wider, and perhaps inevitable, association between scientific and imperial authoritative identities.

In *Voices Prophesying War*, I. F. Clarke outlines the primacy of war in the literary imagination in the period 1871-1914.<sup>11</sup> He argues that advances in science and technology provided the kindling for myriad stories of imagined warfare, maintained by political anxieties regarding the security of Britain as a European power. It is thus unsurprising that parasitologists and literary authors alike used the popular motifs of war to understand the relationship between man and nature. Clarke argues that imaginary wars in the 1890s were 'burdened by a long tradition, which presented war as an affair of brief battles and heroic deeds by individuals', a tradition to which parasitologists also appear to have subscribed.<sup>12</sup> A book to tackle malaria written by Ross in 1901 was given the name 'Mosquito Brigades' and advertised as 'an authoritative work by a World

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<sup>8</sup> London, LSHTM. RC. Ross/150/02/01-04 Norman Edwards, editor of *Wireless Review* and *Science Weekly*, to Ross. 29 May 1923.

<sup>9</sup> 'Saved 1,000,000 Lives. Late Sir Ronald Ross' *Northern Miner*, Friday 25 November 1932, p.4.

<sup>10</sup> See e.g. C. W. Salesby, 'Sir Ronald Ross, An Empire-Builder' *Daily News* Saturday, 6 October 1923, p.5. William Macgregor, 'An Address on Some Problems of Tropical Medicine' *British Medical Journal* 2(1900)2075, pp.977-84.

<sup>11</sup> Although the book addresses the wider time period of 1763-1984, Clarke identifies this specific time period in chapter one as a significant epoch of thought marked by the publication of George Chesney's *The Battle of Dorking* at the one end and the beginning of the First World War at the other.

<sup>12</sup> I. F. Clarke, *Voices Prophesying War, 1763-1984* (London: Oxford University Press, 1966) p.69.

Famous Scientist Indispensable to All Engaged in the Warfare Against the Deadly Mosquito'.<sup>13</sup> 'Brigade' here suggests an alignment with Clarke's notion of war as predicated on heroic battles and military sub-units. Moreover, the parasitology narrative put forth by its proponents often favoured an even older kind of warfare: that of the chivalric knight, in a fervent adherence to myths of historical nationhood. This choice of representation demonstrates the importance of nationhood to the twinned projects of parasitology and empire, as well as an awareness of cultural vogue.

Around the same time, allied more heavily to parasitic worms, literary authors were using the motif of the parasite-host relationship to explore psychological models of selfhood and their relationship(s) to somatic identity. Authors like Stevenson and MacDonald used the discourses of evolutionary biology and embryology to bolster their engagements with notions of psychological doubleness—of a hidden, inherited, primitivism that might, at any moment, overwhelm the host's conscious identity. The parallels that biologists like Ernst Haeckel and E. Ray Lankester were drawing between parasitic lifestyles and degeneration,<sup>14</sup> and that journalists were making between human society and the natural world, endowed the parasite-host motif with greater power. Indeed the physiological degeneration that accompanied discourse on biological parasites was imported into and often eclipsed depictions of the social parasite. Suppositions like Lankester's that the degeneration of an animal 'may be due to the ancestors of that animal having taken one of two new habits of life, either the

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<sup>13</sup> London, LSHTM. RC. Ross/64/02. Pamphlet to advertise 'Mosquito Brigades'.

<sup>14</sup> E.g. 'With regard to parasites, naturalists have long recognised what is called *retrogressive metamorphosis*; and parasitic animals are, as a rule, accepted to be instances of Degeneration.' E. Ray Lankester, *Degeneration: A Chapter in Darwinism* (London: Macmillan and Co, 1880) p.30.

parasitic or the immobile' (50), fuelled the social fear of parasitic behaviour by suggesting that the human race might undergo behaviourally induced degeneration. The ending of Lankester's book expresses just this anxiety: 'it is well to remember that we are subject to the general laws of evolution, and are as likely to degenerate as to progress' (60). Such associations between degeneration and parasitism expose encoded anxieties about unequal societal relationships and about psychological and somatic health.

By reading such diverse fictional and non-fictional engagements with parasitic disease, we gain an insight into the relationship between science and society and can recognise the use of the discourses of parasitology to explore ideas about personal and national identity. The importance of the imagination in these encounters is evident; however, what I have endeavoured to demonstrate in this thesis is that this imaginative framework functions in both types of exploration. Imagination is as important to science as it is to literature. Lankester recognised this when outlining the relationship between evolution and degeneration:

All true science deals with speculation and hypothesis, and acknowledges as its most valued servant that which our German friends call "phantasie" and we call "the imagination" [...] the advancement of science [...] flourishes and progresses by the aid of suppositions and the working of the imagination' (3).

Although I eschew the notion that imagination is a device confined to fiction, and recognise its fundamental importance to the kind of experimental science that gave Britain its first Nobel Prize (Ross's malaria-mosquito discovery), I argue that parasitologists also employed a specifically literary imagination. This consolidates my claim for the relationship between parasitology and the British literary imagination as bi-directional. This literary imagination is evident in Ross's suggestion that he will turn the events he watches under the microscope into a novel, using the framework of the three musketeers to understand the interactions between plasmodium parasites and the host immune response. Most obviously it manifests in the way that parasitologists talk about themselves and their professions using literary myths of nationhood, as outlined in my second chapter, and, in the characterisation of parasites as personified saboteurs, as outlined in my fourth chapter.

Masefield's characterisation of the trypanosome parasite in *Multitude and Solitude* (1909) as ammunition for its arthropod vector, or Lovecraft's characterisation of the tsetse fly in 'Winged Death' (1934) as enacting a protracted and pointed revenge on his protagonist, echo Patrick Manson's descriptions of *plasmodium* parasites as sheathed assassins. The anthropomorphisation of parasites, exemplified by Manson's descriptions, and by Ross's appellation 'our little malaria pets', spills over into their private correspondence, demonstrating that this was not only a communicative, but also a hermeneutic tool. His description of Ross's vulnerability to disease in terms of the parasite's 'grudge' indicates that Manson saw parasites as being in direct opposition to parasitologists, and by extension, that he understood parasitology



as a science in which individual researchers struggled against individual agents of disease. He warns:

Take care of yourself in that God forsaken country to which you go. Be specifically careful on your way home. I am gradually learning that one of the most dangerous times is when the ship on the way home passes the Canaries and begins to enter cool weather. Then blackwater [fever] is apt to develop [...] take care and don't wake up in the next world complaining that you had no warning. The plasmodium has a special grudge against you and doubtless is looking out for a chance to wreak its revenge.<sup>15</sup>

These characterisations do not serve a specifically empirical purpose, but rather demonstrate an engagement with wider literary and imaginative frameworks. The similarities between the discourses of parasitology and the discourses of fiction in this period indicate a shared, distinctly anthropocentric, outlook.

Despite increasing specialisation in science, the importance of the literary imagination, both in creating professional identities and in working through problems, is evident. Parasitologists like Ross recognised the function of literature as 'clothing' for science,<sup>16</sup> both of which, according to Ross, have the shared goal of educating the public. In this way fictional renderings of parasitic disease facilitated the public understanding of science in regard to tropical medicine. Henry Seton Merriman's *With Edged Tools* (1894), perhaps inadvertently, provided a point of access for discussions of racial immunity to sleeping sickness,

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<sup>15</sup> Patrick Manson, 'Letter 183 49/045' *The Beast in the Mosquito*, pp.418-20. (pp.419-20).

<sup>16</sup> Ronald Ross, 'Homer, Dante, Shakespeare, and Cervantes', p.137.

while Masefield's anticlimactic ending to *Multitude and Solitude* (1909) encapsulated the global politics of parasitology research. Elsewhere these fictions act as time capsules, with stories like 'The Adventures of a Man of Science' engaging with then current, though since disproven, theories—in this case Manson's *Filaria perstans* theory. In addition to this, parasitology provided the literary imagination with a flexible metaphor for understanding selfhood. The parasite-host dichotomy and the parasite-vector-host relationship became frameworks that encouraged a reconsideration of the relationship between humans and the natural world. Moreover, these frameworks spoke to pre-existing anxieties about corrupt societal relationships, imperial politics, and psychological health.

The years 1885-1935 constitute a pivotal historic moment, witnessing the diversification of science into research specialisms and with it, the theoretical rejection, yet increased deployment, of interdisciplinary perspectives. The symbiotic relationship between parasitology and the British literary imagination draws attention to the ways in which research is narrativised and can tell us much about how the public understands and engages with science. By placing the exploits of parasitologists under the microscope, we rediscover the hermeneutic tools to better allow us to critically consider the political frameworks that underpin science.

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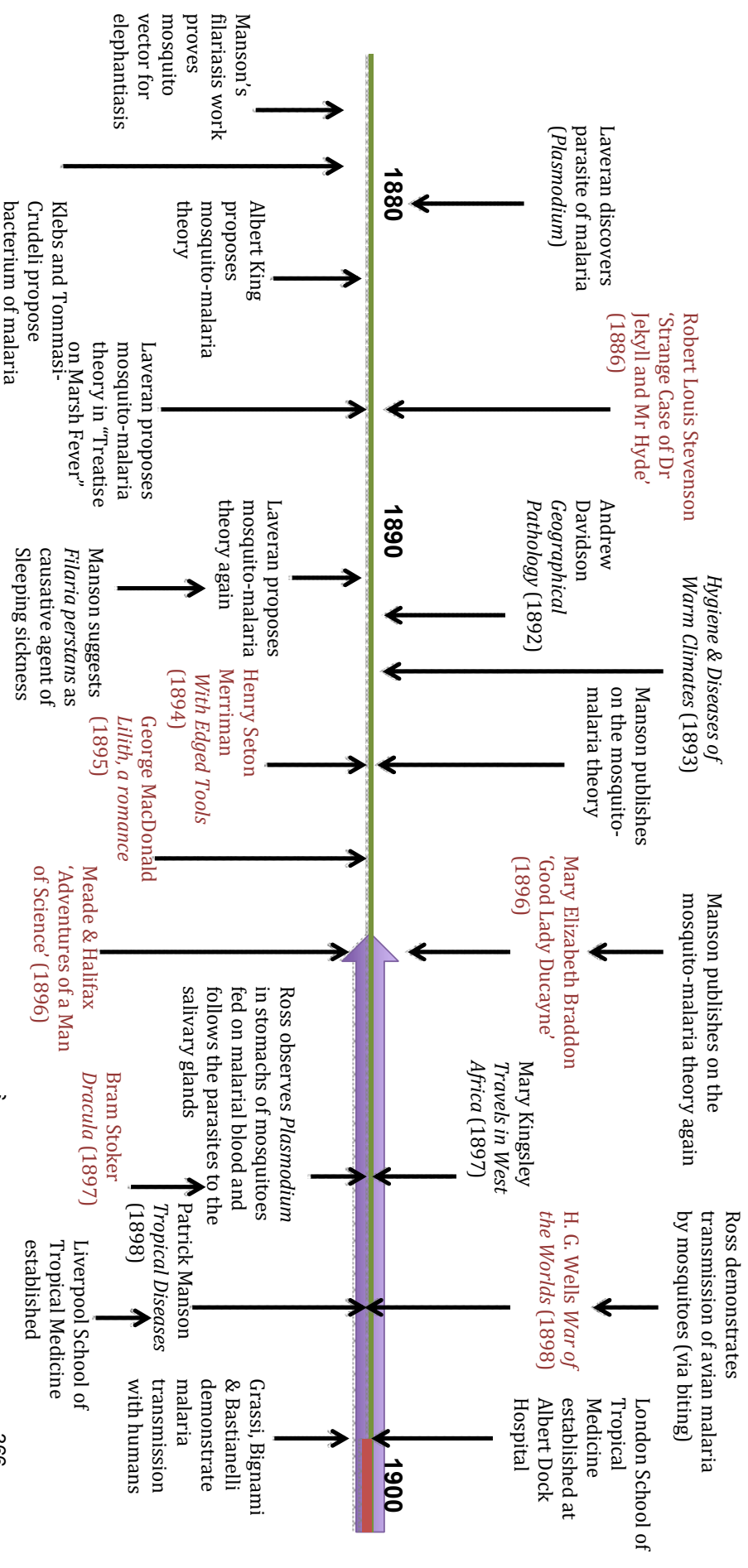
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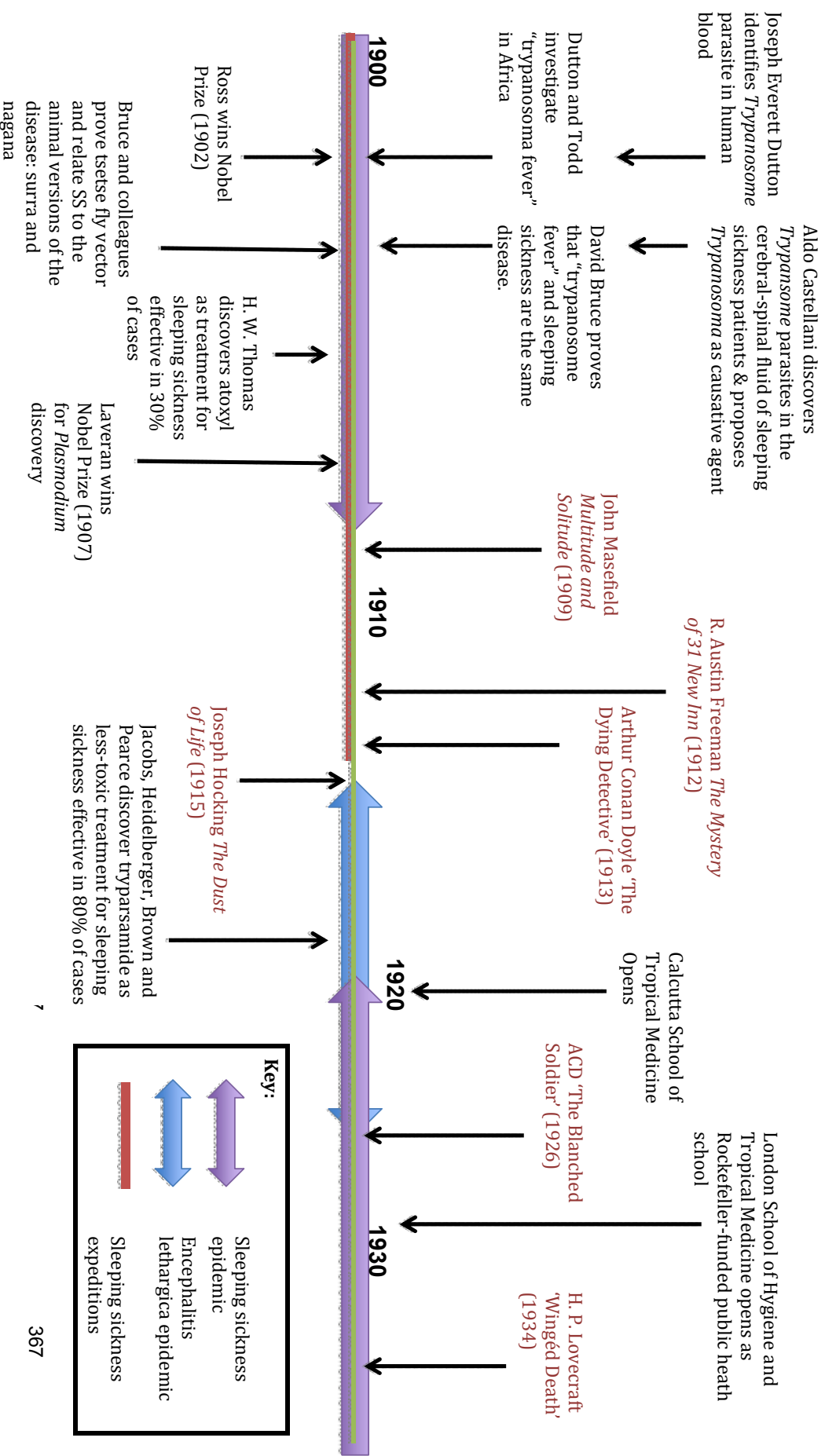
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# Appendix 1

## Timeline of Parasitology Research and Literary Publications



## Timeline of Parasitology Research and Literary Publications (Cont'd)



## Appendix 2

### Supplementary Material: Illustrations

Holloway's Ointment Pot, showing Hygeia and Telesphorus.



Image source: Paul Barker, 'Thomas Holloway 1800-1883' *Victorian Ointment*

*Pots* <<https://sites.google.com/site/ointmentpots/victorian/holloways>>

[accessed 22 March 2016]

Reekie's Ointment Pot

Image source: Paul Barker, 'Reekie's, The

Great Healer' *Victorian Ointment Pots*

<<https://sites.google.com/site/ointmentpots/victorian/reekies>>

[accessed 22 March

2016]



Holloway's Pills and Ointment Advertising Card



Image source: David  
Badke, 'Medicine in 1860s  
Victoria, Holloway's Pills'  
*Victoria's Victoria*  
(Victoria: University of  
Victoria, 2002)

Character Sketch: Koch as the New St George



From: 'Character Sketch. Dr. Robert Koch' *Review of Reviews* 2(1890)12 pp.546-551. (p.547).