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Interdisciplinary Perspectives on Mesmer and His Legacy: Literature, Culture, and Science

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Abstract

The second half of the eighteenth century saw the emergence of Franz Anton Mesmer's theories and therapies concerning the curative power of animal magnetism, an innate force that he claimed could be harnessed and directed to great healing effect. Formally dismissed by a French Royal Commission in 1784, the many positive treatment outcomes were attributed to the patient's own imagination. This acknowledgement by the scientific fraternity that imagination alone could effect cures signalled that Mesmer's work had uncovered new, exciting and even dangerous possibilities about the power of the mind. Always a controversial subject, those who chose to examine animal magnetism, or its later incarnations of mesmerism or hypnosis, were always at risk of social and professional criticism, even disgrace and exclusion, which raises the question of how and why respected members of the social and scientific community would approach this multifarious topic.

By selecting as case studies three previously neglected figures in the mesmerism scholarship, namely, Ada Lovelace and two physician-writers, Santiago Ramón y Cajal and Arthur Conan Doyle, as well as incorporating a cutting-edge discussion of Mesmer's life, 'art', and complicated relationship with the scientific community, this thesis offers new perspectives through which to re-examine the complex phenomenon of mesmerism, its possible medical applicability, and the manifold literary representations it elicited. Drawing upon archival sources, scientific texts, letters, non-fictional and fictional works, this interdisciplinary study combines close textual analysis with an examination of scientific, social and cultural contexts. Through this pluralistic critical approach, and by seeking to understand the endurance of what may now be considered a protoscience rather than a pseudoscience, the thesis concludes that while Mesmer's work paved the way for a serious research into the constructs of the mind, the qualities of vision, observation and communication are essential to the re-evaluation of new ideas and their interpretation.

Introduction

Animal unity, the unity of a universal fluid, the unity of matter, all these recent theories, by a strange coincidence, have somehow entered the minds of poets at the same time that they have entered the minds of scientists (Charles Baudelaire, 'Preface' to Edgar Allan Poe's *Mesmeric Revelation*, 1848).

By the time that Charles Baudelaire wrote these words, Franz Anton Mesmer (1734–1815) had been dead for over thirty years. However, animal magnetism – the name that Mesmer gave to an innate force common to all living things that he asserted could be harnessed to heal the sick – was far from defunct and Mesmer's own name had become synonymous with therapies and treatments claiming to use this energy. Baudelaire's comment reflects the dual aspects of the spiritual and scientific that surrounded the theories of animal magnetism and the often-frenzied enthusiasm for the subject. The fascination with animal magnetism, or mesmerism as it became known, and all its evolved forms, which includes the medical practice of hypnotherapy, still exerts a hold today. It is both the endurance of this phenomenon and the diversity of its impact that concerns this thesis.

The survival of animal magnetism is surprising as the extensive investigations into Mesmer's work carried out by the French Royal Commission in 1784 had culminated in the publication of a series of damning reports that dismissed the existence of animal magnetism. In addition, the Commission acknowledged that while the positive therapeutic outcomes in those treated by animal magnetism were mostly genuine, these results were due to the imagination of the patient rather than to animal magnetism itself. Such a statement was controversial for, as Benjamin Franklin, one of the Commissioners, wrote, 'many wonder at the force of imagination described in it [the report]' (Franklin 1906: 543), signalling that Mesmer's work had uncovered new, exciting, and even dangerous possibilities about the power of the mind. In turn, the idea of the imagination effecting improvements in health also undermined the power of the medical institutions, as it implied that their specialized knowledge was no longer needed. In England, the Commissioners' report was considered so important that the English writer and political theorist William Godwin was commissioned to provide a full

translation from the French original. In his Introduction to the translation, Godwin calls animal magnetism an ‘imposture’, but also comments that the report ‘seems to throw new light [...] respecting the influence of the imagination upon the animal frame’ (1785: xvii).

Intentionally or otherwise, the findings of the French Royal Commission encouraged a different way of looking at how the mind works and its construction of the self. Therefore, the findings of the 1784 Commission fuelled, rather than detracted from, the popularity of the practice of animal magnetism. This is evidenced by the prosperity of the *Société de l’Harmonie Universelle* (Society of Universal Harmony), an elite group that followed a similar model to Masonic lodges where, in return for a large subscription, Mesmer would divulge the secrets of his therapy. From its inception in Paris in 1783, the Society rapidly expanded, and by 1789 the Paris cohort numbered 430 and branches of the Society thrived in the major cities and towns across France.

Animal magnetism, as a healing therapy, underwent numerous changes over time. At first, Mesmer’s treatments involved the application of large magnets to the patient’s body; however, he later discarded the magnets, claiming that his own body alone could act as a conduit, enabling the so-called magnetic fluid to flow into the patient either directly or by the patient touching objects that had been magnetized, such as the baquets used in Mesmer’s salons or the large trees in a garden. The next change in the treatment using animal magnetism involved the mesmerist inducing a trance-like state of somnambulism. It was this practice of mesmeric somnambulism that drew a more positive response from the medical fraternity, resulting in the establishment of a further French Royal Commission in the early decades of the nineteenth century.

Animal magnetism became a subject that, as Baudelaire noted above, was considered worthy of study by many respected figures in the worlds of science, medicine, philosophy, and the arts. However, a schism had formed between the proponents of animal magnetism and the more orthodox elements in the scientific and medical institutions. With each passing decade, the power and influence of these institutions grew as they endeavoured to retain and increase their professional integrity against the threat of quackery and, less altruistically, to maintain their own livelihoods, as well as protecting the general public from the many remedies and treatments that were considered to have no real basis for their claims of efficacy or that could be harmful. However, this meant that medical practitioners who may have tried to

introduce new therapies or challenged prevailing opinion were opening themselves up to the possibility of ridicule and hence risked losing their reputations and livelihoods. Therefore, it was a brave, or perhaps foolish, step that was taken by those who came out in support of animal magnetism, although it should also be noted that there were some practitioners who succeeded in their investigations without castigation, while others incurred the wrath of the institutions without receiving a fair hearing. This uncompromising, but occasionally unpredictable attitude towards what is acceptable, and the implications of suppressing investigations into ideas and theories that do not fit with the conventional beliefs of the day, offers a rich and complex area of research that constitutes the subject of this thesis.

Mesmer was a prolific publisher of medical material, using pamphlets, letters, and articles to promote and explain his innovative method, as well as often justifying and defending his work, including the publication of a very dismissive letter to the Queen of France, Marie Antoinette, in 1781 (Mesmer 1781: 215–20), which is discussed in Chapter 1. Likewise, one of his most famous disciples, the French physician Charles Deslon, who was a well-respected member of the Faculty of Medicine in Paris, offered a loquacious endorsement of Mesmer's work, although this defence ultimately resulted in his expulsion from the Faculty. The widely distributed publication of the Royal Commission's 1784 report into animal magnetism provides a detailed account of the early forms of randomized controlled trials that were used to try to identify Mesmer's elusive magnetic fluid (Franklin et al. 2002).

This thesis evaluates, assesses, and compares the inception, dissemination, and reception of Mesmer's work and its subsequent evolution, medical ramifications, and literary and cultural representations. As stated in the title, this is an interdisciplinary study. The social historian Joe Moran defines interdisciplinarity as 'any form of dialogue or interaction between two or more disciplines', suggesting that 'interdisciplinarity is always transformative in some way, producing new forms of knowledge in its engagement with discrete disciplines' (2010: 14–15). This is an important point as a comprehensive investigation of Mesmer's work requires engagement with a range of subject areas, for example, the history of science, scientific methods, medical humanities, comparative literature, and literary criticism. Examining Mesmer's work and its legacy from these different perspectives facilitates an exploration that goes beyond the specific boundaries of any one field to identify

potential commonalities, liminalities and lacunae, thus allowing the construction of a rigorous multidimensional viewpoint. An additional level of complexity to this debate, but one that is essential in order to reflect the nature of how ideas can advance, relates to the spatial and temporal aspects of the project, crossing as it does national boundaries, and periodizations, spanning nearly two centuries across several European countries. This is emphasized within the thesis by the role of translation and the requirement for rapid dissemination of the scientific news, for example, and, as mentioned earlier, the writer William Godwin was given an urgent commission to translate the French Royal Commission's report on animal magnetism into English as it was considered a work of ground-breaking importance.

A further important contribution to this thesis is the role of the imagination. This appears in two guises: the first places an emphasis on the medical and moral implications of suggestibility, as articulated in the French Royal Commission enquiry into animal magnetism; and the second interpretation applies to the creative imagination, which is often interlinked, particularly by the Romantics, with the trance state, but in this context it is explored in terms of original thought and the way that it can facilitate innovation and technical advancement. Both forms of the imagination come together in the debate on mesmerism, as they form a juxtaposition to the rationality of science that prevailed as part of the Enlightenment and the rise of the scientific professional.

It is impossible to consider this historical and cultural period without reference to the most significant scientific procedures, discoveries, and technical inventions of the era, an aspect that is considered throughout the thesis. For example, despite his deviation from the path of orthodox medicine, Mesmer had been trained in the latest clinical techniques at the medical school in Vienna and exposed to the strict mechanistic teachings that derived from the famous work pioneered at the University of Leiden. The great innovators in electricity and chemistry, Franklin and Lavoisier, respectively, served on the committee appointed to evaluate Mesmer's theories.

The terms 'animal magnetism', 'mesmerism', and 'hypnosis' are all used at various times within the thesis and deserve a succinct explanation. There is much critical debate about the demarcation of these terms; however, this thesis generally adopts animal magnetism when referring to the theories of Mesmer himself and uses the term mesmerism in the time after Mesmer was working, although sources are kept as per their original usage. However, mesmerism is deemed to be synonymous with animal

magnetism, for, as Robert Darnton notes, the terms ‘mesmérisme’ and ‘magnétisme animal’ were used interchangeably in the 1780s (1968: ix).

A shift in the use of the term ‘mesmerize’ occurred in the mid-nineteenth century and has persisted in English usage to this day. At this time, the term adopted the meaning of fascination, to hold spellbound, to affect someone as if by hypnosis and reflected the view that mesmerism could cause one person to exert a power over another, voluntarily or otherwise. This rather broad definition became a popular trope in fiction, particularly sensational literature, and fuelled the occult aspects associated with the practice of mesmerism or hypnosis, contributing to the controversial nature of the practice.

The term hypnosis was introduced by James Braid in the 1840s in association with his research. While hypnosis may share a root with animal magnetism, as noted by William Hughes, hypnosis does have a physiological basis and therefore the two terms cannot be used interchangeably (Hughes 2015: 13). That said, and while the term hypnosis was intended to differentiate the practice from the sensational connotations of mesmerism, in popular culture the two were not perceived that differently, with hypnosis becoming into more frequent use, particularly with reference to the trance state and it perhaps carried a higher level of status than mesmerism.

Mesmer and the critical scholarship

To his patients, Mesmer was a visionary saint able to effect miraculous cures, while to the scientific institutes of Paris, he was a fraud who duped his wealthy patients out of large sums of money and brought the medical profession into disrepute. Such conflicting beliefs about the man and his therapies persist today. Since his death in 1815, there have been numerous biographies of Mesmer, for example those by Margaret Goldsmith (1934) and James Wyckoff (1975), as well as books associated with his theories, including Henri Ellenberger’s *The Discovery of the Unconscious* (1970), which examines Mesmer’s role in the evolution of dynamic psychiatry, Adam Crabtree’s extensive study *From Mesmer to Freud: Magnetic Sleep and Psychological Healing* (1993), and Derek Forrest’s *Hypnotism: A History* (1999). However, the most authoritative and comprehensive scholarship on Mesmer is Frank Pattie’s *Mesmer and Animal Magnetism: A Chapter in the History of Medicine* (1994). Pattie offers a systematic critical study of Mesmer’s art and life that is informed by the principal medical, cultural, and biographical discourse of the period. Working in post-war Paris

with Robert Amadou, the French writer who specialized in esotericism and was a great collector of material relating to animal magnetism, Pattie had access to and assisted in editing Amadou's 'complete compendium of Mesmer's work in French' (Pattie 1994: 285). Pattie also offers a psychological perspective on Mesmer, concluding that Mesmer was a charlatan because 'he claimed to have knowledge which he did not have, and he rejected the methods of investigation that would have given him the knowledge that he needed' (283). Although harsh in applying the label of charlatan to Mesmer, Pattie retains a fair and objective approach, describing Mesmer as 'a humanitarian, providing free treatment for the poor, and later writing on ethics, religion, and life in society' (3). Pattie echoes Franklin's view (1970: 181) that by promoting animal magnetism as a cure, Mesmer saved numerous people from the harmful therapies and often poisonous medicines of the day (Pattie 1994: 283). Pattie's text offers a wealth of contextual information, extending the research beyond the material produced by Mesmer himself to take in other contemporaneous accounts, thereby seeking to dispel the myths that have proliferated about Mesmer and his alleged mystical powers.

A direct link to the discourses that took place between Mesmer and his adversaries in Vienna is available in a collection of important articles and pamphlets in the 1778 edition of *Sammlung der neuesten gedruckten und geschriebenen Nachrichten von Magnet-Curen, vorzüglich der Mesmerischen* (A Collection of the Latest Printed and Written News on Magnetic Cures, In Particular the Mesmeric), a rare work available only in German, that sheds light on the proprietorial tone that Mesmer would adopt in defence of his theories and treatments. This illustrates how Mesmer resorted to publishing vitriolic accusations against anyone who posed a threat to him and his work, an approach that became a pattern in his future disagreements.

The dramatic and public rejection of animal magnetism by the French and Viennese institutions contrasts with the more measured reception of new developments on the topic that were revealed by two eminent nineteenth-century physicians: James Braid, a Scottish physician practising in Manchester, who would later be known for his investigations into the phenomenon of 'hypnosis', and Jean-Martin Charcot, the famous French neurologist who controversially introduced hypnosis into his clinical work at La Salpêtrière Hospital in Paris.

James Braid, regarded as the 'father of hypnosis', played a crucial role in the development of animal magnetism by transforming it into the more scientifically

accepted procedure that became known as ‘hypnosis’ (a term that he coined), meaning that his retooling of mesmerism into a more respectable healing therapy has been widely acknowledged in the critical scholarship (see, for example, Crabtree 1988: 121–2, 125; Forrest 2000: 46–7; Gould 1992: 279–88; Waterfield 2004: 201–4). In 1843, Braid published *Neurypnology; or, The Rationale of Nervous Sleep, Considered in Relation with Animal Magnetism*, which detailed the findings of his detailed investigations into hypnosis. Braid used his innovative hypnotic method to treat his patients at Edinburgh, thus applying its curative powers to heal diseases, as well as using hypnosis as surgical anaesthesia. Braid’s pioneering work offers a rich insight into his rigorous scientific methods, which aimed to lend credibility to a formerly discredited healing therapy.

If Braid is considered to be the most influential theorist and practitioner of hypnosis after Mesmer, Jean-Martin Charcot at the Salpêtrière in Paris has been similarly elevated as a key figure in the study of hypnosis, as he continued and developed Braid’s work by imbuing the method with ‘scientific rigour’ in what he defined as the ‘three stages of hysteria’: lethargy, catalepsy, and somnambulism (Bliss 1986: 21).

Even when supported by new scientific findings, as in Braid’s research in the 1830s and the research presented at the First International Congress on Hypnosis held in Paris in 1889, the perception of mesmerism as a popular entertainment or an occult practice, rather than a serious therapy, never completely went away. In Braid’s time the well-respected London-based professor of medicine, John Elliotson, was ridiculed for crossing the boundaries of medical propriety in his mesmeric practice. In a similar way to Mesmer’s work having been tainted by the salacious and sensational aspects of his therapies, so too have Charcot’s theatrical demonstrations of his work concerning women suffering from hysteria at the Salpêtrière Hospital been the subject of much controversy and debate. In *Charcot: Constructing Neurology* (1995), Christopher Goetz et al. offer a comprehensive volume on Charcot’s career that concentrates less on his investigations into hysteria and hypnosis and more on his clinical and anatomical work. Of particular interest here is Charcot’s engagement with the international community, for example in his research into ‘railway spine’ or ‘railway brain’, a nervous condition that resulted from traumatic accidents (Goetz et al. 1995: 202). This phenomenon was incorporated into his work at the Salpêtrière, and resulted in Charcot arguing that men as well as women could suffer from trauma-induced hysteria, rather than it being a purely female affliction. Charcot’s work received global recognition in 1881 when he

attended the illustrious International Medical Congress in London, although in France he was already known as ‘le père de la neurologie’ and the ‘Napoleon of Neuroses’ (Waraich and Shar 2017: 48).

Charcot’s observational method, particularly of the women in the provocative study on hysteria, involved examining and treating his patients in front of a curious audience of the Paris elite at his famous ‘Tuesday lectures’, which were open to the public, as well as recording his findings in a detailed photographic record. The photographs have been published in Georges Didi-Huberman’s *Invention of Hysteria: Charcot and the Photographic Iconography of the Salpêtrière* (1982), translated into English by Alisa Hartz in 2003. Didi-Huberman described this work as a ‘triple project of science, therapy and pedagogy’ (2003: 32). Under the clinical gaze of his students and a select audience, Charcot adopted techniques such as hypnosis to induce a hysterical attack, where he ‘interpreted hysteria [...] but like a conductor of an orchestra’ (2003: 186), in a representation of the physician’s power over the body of the patient.

In the course of his work on hysteria, Charcot maintained that hypnosis could help to treat the condition and that by putting patients into a hypnotic trance he could induce a hysterical episode, whereby ‘these mental states and the plasticity of neurological signs offered Charcot an organic model’ (Harris 1985: 310–11). However, this view was challenged by the Nancy School (represented by the physicians Auguste Liébeault and Hippolyte Bernheim), which believed that a person’s capacity to be hypnotized was determined by their susceptibility and was not related to hysteria. This disagreement became public in a murder trial in 1890 that culminated in both sides being invited to be expert witnesses, in which the accused woman was said to have committed the crime while hypnotized by her male lover. The representative appearing for the Salpêtrière announced that this unlikely sequence of events was not possible, as the woman was not suffering from hysteria, while the Nancy representative believed that it was. The jury found in favour of the Salpêtrière School’s verdict, but the disagreement was widely reported in the popular press, leading to much debate on the moral issue of hypnotic crime.

From its very inception, animal magnetism was a phenomenon that courted public interest and debate, not only illuminating scientific and medical discourses but also traversing social, political, and geographical boundaries to provide an alternative way to view the attitudes, beliefs, and anxieties of the times. By bringing social and political

perspectives to the fore, Robert Darnton's groundbreaking scholarship, *Mesmerism and the End of the Enlightenment in France* (1968), focused on the movements that developed around animal magnetism, rather than Mesmer himself. Darnton examined how pre-revolutionary groups appropriated and shaped the idea that healing powers were not solely the province of a privileged elite, transmitting a surreptitious message, described by Darnton as 'a camouflaged political theory', as the extensive popular interest in the phenomenon provided 'radical writers with a cause that would hold their readers' attention without awakening that of the censors' (Darnton 1968: 3). In order to research his book, Darnton turned not just to published sources but to the 'scraps of popular songs and cartoons that were hawked in the streets, in the letters-to-the-editor, police reports and records of club meetings' (vii) to gain as accurate a picture as possible of the interests and ideas of the reading public. This inventive form of investigation was richly rewarded by the detailed picture of the counterculture that grew out of what was intended as a revolutionary medical therapy, and highlights the value of scrutinizing what at first glance can appear to be mere 'scraps'.

The nineteenth century saw a revival in mesmerism, not just in terms of its re-examination from a scientific point of view but also in popular culture. As a result of educational reforms, literacy increased and advances in printing technology provided a wealth of newspapers and periodicals that informed the general public of the developments in science and medicine, mesmerism having the added advantage of not only being a topic under debate by the medical authorities, but also being one that featured in local demonstrations and lectures, and might even feature as evening parlour-room entertainment. As Alison Winter comments in her monograph, *Mesmerized: Power of the Mind in Victorian Britain* (1998), 'by the 1840s, most Victorians would have had some idea of what went on in a mesmeric séance' (1998: 2), and here Winter examines the social impact of mesmerism. Focusing particularly on mesmerism's pivotal role in the changes taking place in scientific and medical authority, as well as the way that the practice served as a method of modelling human interaction, Winter examines the central and very public debates that influenced the reception of mesmerism, particularly disputes relating to the eminent physician John Elliotson. Elliotson was to lose his position at London's University College Hospital as a result of his association with mesmerism, as well the national preoccupation that developed around the subject, stating that, 'whenever mesmeric experiments took place, a little bit

of Britain was transformed into a laboratory for studying social relations' (7). Winter sets her debates firmly within the British context, with little reference to the similar developments that were occurring elsewhere, particularly in France and Germany. She extends her discussion into a consideration of the mesmeric cure, looking at its use in the treatment of women in the sickroom, with a notable section on Harriet Martineau's account of her return to health through mesmerism. In her discourse on power, Winter comments on how the figure of the mesmerist can be seen through charismatic orators or performers, as well as the conductor of an orchestra, an image that was reinforced by George du Maurier's sensational novel *Trilby* (1894), where the manipulating mesmerist, Svengali, uses his powers to control a young girl, imbibing her with an enchanting voice, a character that would fuel the imagination of the Victorian reading public.

William Hughes' scholarly work *That Devil's Trick: Hypnotism and the Popular Imagination* (2015) takes its title from Paul Potter's 1895 successful stage adaptation of du Maurier's *Trilby*, when Svengali employs 'that devil's trick' (Hughes 2015: 210), that is hypnotism, to cure Trilby's headaches. In this monograph, Hughes takes the view of the popular representation of hypnotism a step further by focusing on the medical aspects of the treatment almost exclusively through the lens of the non-medical press, referencing an impressive array of articles from newspapers and magazines, as well as advertisements, to provide an insight into how mesmerism would have been presented to and received by the general public. Confining such an examination almost solely to the non-medical press, and therefore using accounts that may not have been subjected to the rigour or peer review of those appearing in more academic publications, Hughes offers a view unmediated by the prevailing medical establishment, although including a consideration of the medical material might have made an interesting comparison. This text is a testament to the value of having access to digitized archives of newspapers and periodicals as they provide a rich resource to researchers, enabling different perspectives to be revealed that may otherwise have gone unnoticed.

With such a controversial and mysterious topic, the ideas, findings, and language of mesmerism in the scientific arena were soon reflected in fictional offerings, where, as noted by Martin Willis and Catherine Wynne in their edited volume *Victorian Literary Mesmerism*, 'the scientist and the writer are also united in their concern with the discovery of truth' (2006: 2). *Victorian Literary Mesmerism* reflects the growing

interest in interdisciplinary studies through a collection of essays that examine class, gender, and criminality, noting that ‘to investigate literary mesmerism is to unveil the reactions and responses, the interventions and influences of one of the key forms of knowledge that the Victorians used to define their sense of self and society’ (7). In considering criminality and the fact that ‘the legal symbolism of mesmerism had always suggested a phenomenon on trial, always already criminalized’ (9), the chapter on crime and hypnotic fiction by Mary Elizabeth Leighton engages with the two key concerns pertaining to mesmerism, its place in medical practice and its association with criminal activity. Reflecting on the research that took place in France at this time and the work of the Nancy School under Bernheim and the Salpêtrière School under Charcot in Paris (2006: 205–8), with reference to the work of James Braid (207), Leighton examines how these ideas were reflected in works of fiction (215–22). Wynne’s own chapter considers two of Conan Doyle’s stories that feature women mesmerists, concluding that here Conan Doyle is examining the nexus between sexuality and science, as well as the domains of the domestic versus the professional (234). Indeed, as Willis and Wynne point out, it is mesmerism’s ‘quasi-sexual ritualism that detracted from the science’s attempt to establish itself as a scientific principle but was responsible for fuelling its literary possibilities’ (2006: 8), an aspect that has always added to its appeal to fiction writers. However, beneath the more sensational elements of the subject matter, there are important issues concerning power dynamics. This case study on Conan Doyle considers how his work incorporated new ideas concerning the studies of the mind to reflect on the evolving role of the scientist, the nature of gender, and the ambiguity of truth.

The thesis also builds on other interdisciplinary works, such as those of Laura Otis’ use of the metaphors of membranes and networks, particularly in relation to Cajal and Conan Doyle, to explore the relationship between nineteenth-century science and society, applying and extending these ideas to the context of mesmerism in order to explore the reception of new but unorthodox therapies in a climate of increasing regulation and scientific scrutiny.

Structure

The research undertakes a thorough re-examination of Mesmer and his theories to offer an integrated perspective on animal magnetism and its reception that brings together

scientific method, an examination of the importance of communication, and its representation in literary works.

Three case studies examine key aspects in the evolution of Mesmer's work across the nineteenth and early twentieth centuries, each offering wide-ranging perspectives on crucial changes that were taking place, not only in the reception of mesmerism but also across the scientific and medical world.

The mid-nineteenth century saw the rise in the power of the medical journals, notably *The Lancet* which was founded in 1823 and, under the editorship of Richard Wakeley, campaigned for medical reforms to professionalize healthcare practitioners, priding itself on protecting the lay public against charlatry and particularly targeting mesmerism. It is this backdrop that is the setting for the first case study which focuses on the English writer and mathematician Ada Lovelace (1815–1852). Lovelace's fame today rests predominantly on publishing not only a translation of a scientific text on Charles Babbage's Analytical Engine, an invention viewed as a prototype for the computer, but for her extensive notes explaining the mechanics of the machine and ideas on its future potential. This achievement was particularly remarkable in an age when women's work was not to contribute to scientific matters but merely to interpret them. In addition to her pioneering work with Babbage, Lovelace maintained a keen interest in many other burgeoning technologies, which she discussed with the leading researchers in the field, including the British scientists Michael Faraday and Charles Wheatstone. Lovelace was at the centre of the scientific, medical and cultural society, documenting her experiences as she witnessed many of the important events of the time. Her correspondence charts her experiences and analyses of mesmerism, as well as providing an extensive account of her medical encounters.

As the century progressed so the scientific and medical professions became subject to more regularization, with increased specialization, the rise of the consultant, a growth of institutions that were devoted to research, and the development of a more formalized doctor–patient relationship. This pivotal time in scientific and medical history, and particularly in terms of the study of the mind, is the setting for two further cases studies. Both concern physician-writers, with each exploring from different perspectives the possibilities emerging from the progress of science and its potential effects on society.

The Spanish neuroscientist, Nobel Prize winner, and physician-writer Santiago Ramón y Cajal (1852–1934) is the subject of the second case study. Cajal is described

by Patricia Novillo-Corvalán as ‘one of the most representative figures of the fruitful interaction between medicine and the arts in nineteenth-century Spain’ (2015: 23). Cajal achieved fame and worldwide recognition for his pioneering work in neuroscience, winning the Nobel Prize for medicine in 1906, despite an unpromising start to his studies and living through the turbulence of *fin de siglo* Spain. In addition to his talent as a scientist, Cajal was a gifted artist and a writer of both fiction and non-fiction. Cajal’s writings covered a number of areas outside his main field of research, including an article documenting his investigations into hypnosis and a story that considers the implications of a scientist who undertakes an experiment of mass mesmerism using a whole town as his subject.

The third and final case study examines Arthur Conan Doyle (1859–1930) and his contribution to the debate on hypnosis. As a physician-turned-writer, Conan Doyle examined the subject through both a medical and a cultural lens. Although chiefly known for his creation of Sherlock Holmes, possibly the world’s most famous detective, who used his reasoning skills and deductive powers to solve his cases, Conan Doyle accumulated a wealth of scientific and medical knowledge and experience, publishing on a range of subjects, both non-fiction and fiction. Through Conan Doyle’s experiences of participating in mesmeric performances, his involvement as a researcher with the Society of Psychical Research, and his exploration of the subject through his stories, his work provides an insight into the complex, and often troubling, aspects of the phenomenon that were emerging across the social strata.

These three figures were selected on the basis of their engagement with contemporary debates surrounding animal magnetism, their imaginative and unusual perspectives on the subject, and their contribution to mesmeric scholarship from alternative vantage points. In addition, these individuals were chosen because of their often peripheral status in relation to mesmerism, as their interest in the subject occupies a marginalized place in their works, especially in the case of Lovelace and Cajal, whose pioneering contributions to the fields of computer science and neuroscience, respectively, have eclipsed their involvement with mesmeric discourses. This means that the thesis throws new light on this less-researched area in their work, thereby providing a new understanding of their innovative engagement with hypnosis, both as a healing practice and as a cultural phenomenon.

The thesis will follow the path of Mesmer’s theories and therapies from their

inception in late-eighteenth-century Vienna, through their examination in pre-revolutionary Paris, to the metamorphoses of the phenomenon of mesmerism that took place across the nineteenth and early twentieth centuries. In navigating the complex and complicated pathway of mesmerism through the intricate web of scientific, literary, and popular cultures that existed in Europe across this broad timescale, a wide array of scholarship and sources were consulted, these included official reports (both legal and medical), pamphlets, newspapers, reviews, letters, and literary works. The thesis is divided into four chapters.

Chapter 1, 'Franz Anton Mesmer: Theories, Therapies, and Early Reception', takes a fresh look at Mesmer himself, expanding on existing scholarship to focus particularly on his influences and methods of communication, and how his theories and therapies were received. Revealing not only Mesmer's scientific and medical ideas and their reception, the chapter also looks at the 'politics' of science, as the complex relationships that existed among key thinkers of the time stretched across Europe, and how their informal networks served to share opinions, both positive and negative. This chapter examines Mesmer's early career, considering how he moved from a comfortable life as a conventional physician in Vienna to incurring, through his discovery, development, and introduction of animal magnetism, the disapproval of the strict imperial medical authorities, which resulted in Mesmer being asked to leave the city in late 1777. The second half of the chapter considers Mesmer's move to Paris and his indefatigable pursuit of professional endorsement of his work from the scientific and medical establishment. As recorded in Robert Amadou's indispensable collection of writings by Mesmer, *F. A. Mesmer: Le magnétisme animal, avec des notes et des commentaires de Frank A. Pattie et Jean Vinchon* (1971), and analysed by critics such as Darnton (1968) and Pattie (1994), his work, once again, met with argument and disapproval, despite the overwhelming popularity with the general public of the treatments and, as many of his patients would claim, their efficacy. Mesmer's campaign culminated in a very public dismissal of animal magnetism by the thorough and well-documented examination carried out by the French Royal Commission of 1784. The Commission's findings were published and widely circulated (Franklin et al. 2002). In refuting the existence of animal magnetism and ascribing any successes to the patient's imagination, the Commission raised important issues about suggestibility and the ability of the mind to influence the body, promoting what Emily Ogden calls 'Mesmer's demon' (2012: 145),

the idea of an unbiddable imagination that was capable of producing such profound effects as the mesmeric crisis or the means to heal. The chapter aims to synthesize and analyse these debates and to consider the power of suggestion in relation to new ideas about the workings of the mind, as well as questioning not only the authority of medical science over the body, but also the relationship between healer and patient.

Chapter 2, 'Magnets and Mesmerism: Ada Lovelace at the Cusp of Reason and Romance', advances the study to the 1830s through to the 1850s, chronicling the work of Augusta Ada Lovelace, a woman described by Betty Toole, the eminent Lovelace scholar, as having 'a very unique path to understanding science and technology, a combination of imagination and experimentation' (1992: 29). While Lovelace is considered a pioneer in the field of computer science, her interest and investigations into mesmerism are less well known. As the only legitimate child of Lord Byron and the radical campaigner Anne Isabella Byron, Lovelace was an educated woman of wealth and celebrity, a position that gave her the confidence and opportunity to be more questioning about the advances of the day than many of her male contemporaries, who were deemed 'professionals' in the world of science and medicine. Lovelace's prolific correspondence provides an immediate engagement with her distinguished circle, which included Michael Faraday, Charles Babbage, and Mary Somerville. Lovelace also had access to her mother's influential contacts, including the journalist and writer Harriet Martineau, who published a controversial narrative of her own return to health through mesmerism, and a comparison is made between Martineau's public approach to the subject and Lovelace's own narrative within her private correspondence. In the course of the research for this chapter, relevant areas of the extensive material belonging to Ada Lovelace and her family and friends were consulted in the Lovelace-Byron papers held at the Bodleian Library in Oxford. This investigation revealed the draft of a review that Lovelace was preparing on the concept of the 'Odic force' (a form of radiation or 'life force' emitted by human beings), proposed by the German scientist Ludwig von Reichenbach, a topic clearly inspired by Mesmer's animal magnetism that was also reviewed by Braid and the wider scientific community. In her draft, Lovelace provides her interpretation of Reichenbach's, at the time, controversial findings, with particular reference to the subject of suggestion and scientific method. In the course of the thesis, Lovelace's draft will be examined and compared with the reviews published by Braid and the physician and practising mesmerist John Elliotson.

Lovelace attended the early demonstrations of mesmerism in London in the late 1830s, witnessing the work of Elliotson, who was at the time a well-respected surgeon and Professor of Medicine at University College Hospital in London, but later would be disgraced through his association with the practice. The papers held at the John Rylands Library at the University of Manchester provided extracts from James Kay-Shuttleworth's 1841 diary that documented these mesmeric performances. As the so-called heyday of mesmerism took hold, particularly through the investigations of James Braid into the new phenomenon of hypnosis, Lovelace was able to chronicle its progress, critiquing the claims of even respected scientists such as Reichenbach by retaining a sceptical eye and applying rational enquiry.

Chapter 3, 'Santiago Ramón y Cajal: Vision, Hypnosis, and the Power of Suggestion' investigates the nexus between science and art through the work of Cajal, a man trained to respect the rigour of empirical research and yet intrigued by the phenomenon of hypnosis that came to prominence at this time. His work provides a fascinating insight into the point where rationality meets the more controversial and subjective aspects of the mesmeric method. Cajal's scientific and artistic legacy is tangible in the spectacular drawings of the brain and the nervous system viewed from his microscope, but he was also a prolific writer and an exceptional artist, producing texts for the international scientific community, as well as more popular articles written under the pseudonym 'Doctor Bacteria'. A detailed account of his scientific work, including his investigations into the subject of hypnosis, is provided in his autobiography, *Recuerdos de mi vida* (1917; *Recollections of My Life*). His book *Reglas y consejos sobre investigación científica* (1897; *Advice for a Young Investigator*), an anecdotal guide written to encourage young would-be scientists in the art of observation, also sheds light on Cajal's philosophy on science.

Cajal is described as a 'physician-writer', a conceptual framework proposed by Alfredo Sosa-Velasco (2010) and Patricia Novillo-Corvalán (2015). As the latter notes, while 'previous scholars referred to Cajal as a research scientist', a medical humanities approach would seek to foreground 'Cajal's multiple roles as a doctor, scientific researcher, and short-story writer' (Novillo-Corvalán 2015: 41). It is his collection of short stories, or what he called 'pseudo-scientific narratives', namely *Cuentos de vacaciones: Narraciones seudocientíficas* (1905; *Vacation Stories*), that gives an indication of his mordant critique of the scientific establishment, particularly since the

ethics of science are considered alongside the ominous possibilities offered by mass hypnosis in the hands of a ruthless magnetizer. Two scholars in particular, Laura Otis and Benjamin Ehrlich, have made Cajal's work accessible to a wider audience. Otis has championed Cajal's work not only by brilliantly translating *Vacation Stories* into English and providing an informative introduction, but also by highlighting the interdisciplinary aspects of his research. Otis' study on cell theory, *Membranes* (1999), considers how the discoveries on this topic in the nineteenth century can act as a metaphor for social and political infection. A later work by Otis, *Networking* (2011), analyses the way that the advances in neurology, particularly Cajal's involvement in the nerve-net model, influenced ideas and communications, such as the 'metaphorical web'. Ehrlich has located Cajal's dream diaries, which were thought to be lost, and translated them into English, providing an accompanying text that offers further insight into Cajal's ideas on the workings of the mind, as well as the physiology of the brain (2016). He has also translated Cajal's more quirky collection *Charlas de café* (2010: *Café Chats*), a collection of aphorisms and meditations born of Cajal's time spent in the lively *tertulias* of Madrid.

Through his investigations into hypnotism, Cajal brought an imaginative, yet realistic, view to this controversial subject, a practice that could potentially alleviate suffering but could also lead to the exploitation of vulnerable people, or at least of those more open to suggestion. By looking at the medical applications of hypnosis and by attempting to map the concepts of consciousness to the physiological workings of the brain, Cajal tried to offer scientific explanations for the mysterious elements of the phenomena displayed. Research is still being carried out to establish how hypnosis works.

The final chapter, 'Arthur Conan Doyle and the Interplay between Science and the Imagination' follows Conan Doyle's work in medicine, notably his time as Joseph Bell's medical assistant at Edinburgh, where he was party to Bell's extraordinary technique of building a detailed patient history based only on careful observation. This influence is evident in Conan Doyle's own medical thesis and the narrative style adopted, which includes a meticulous description of a typical patient diagnosed with a fatal degenerative condition (Conan Doyle 1885: 31). His thesis on neuronal disease also references the work of Charcot. Conan Doyle's engagement with medical research, particularly from his study of ophthalmology and the popular science articles that he

wrote, is reflected in his fiction, as can be seen in the Sherlock Holmes story 'A Case of Identity', published in 1891, written shortly after Conan Doyle went to Berlin to write an article on Robert Koch's findings on tuberculosis. Here, as Laura Otis notes, Holmes comes close to his desire 'to scrutinize every cranny of the imperial capital' through his capacity to see things in new ways, because, like scientists such as Koch, 'he knows what to look for' (1999: 93). However, the concept of close scrutiny and the importance of observation could be applied to Conan Doyle, and Koch himself was not infallible. After visiting the hospital wards where Koch was treating patients with tuberculosis with his new much-publicized remedy, Conan Doyle reported that there was no evidence for the treatment's efficacy, a claim that was later substantiated by others.

In keeping with his investigation of Koch's remedy for tuberculosis, Conan Doyle was, initially at least, sceptical of mesmerism. This was witnessed by a newspaper account of his attendance at a performance on the phenomenon in Southsea in 1889, when he displayed his resistance to submitting to the will of the performer. He was an early member of the Society of Psychical Research and led a number of investigations that resulted in the rational explanation of their supposed supernatural causes. Through the creation of his famous detective, Sherlock Holmes, he embodied materialist scientific thought, yet his early tales on the subject of suggestion are full of Gothic sensationalism. For example, a close reading of his relatively obscure short story 'The Winning Shot' (1883) suggests that the themes explored by Bram Stoker in *Dracula* (1897) were already present in Conan Doyle's work some years earlier. Conan Doyle was a great social commentator, becoming involved with and writing about the important and popular issues of the day, whether it was publishing an article on bacteriology, applying himself to new winter sports, or advocating divorce laws. Therefore, the contemporaneous research into the workings of the mind, the threat of controlling influences, and the dangers from the hidden self, would all have been of great interest to Conan Doyle, as shown by his attendance at the mesmeric demonstrations. However, this apparent contradiction of Conan Doyle as a rational physician and as a writer of ambiguous stories concerned with the power of the mind and suggestibility implies that he was not solely writing these stories for financial gain, but exploring the ideas that featured in the cultural psyche as well as in the research laboratories.

Chapter 1

Franz Anton Mesmer: Theories, Therapies, and Early Reception

This chapter considers the theories and therapies of Franz Anton Mesmer (1734–1815) and their reception in Vienna and Paris during the latter part of the eighteenth century. Although Mesmer was dismissed by many of his contemporaries as a charlatan, animal magnetism – his much-disputed healing therapy – is often hailed as a turning point in the development of psychology and hypnotherapy. The recognition of the powerful influence of the mind over the body, described at the time as ‘imagination’, the dynamics of the relationship between the physician and patient, often termed the ‘rapport’, as well as the strategies deployed to assess the validity of animal magnetism, are all crucial aspects of scientific method and medical understanding that came to the fore as a result of Mesmer’s work and the surrounding investigations.

The second half of the eighteenth century was a time of discovery and invention as lightning rods and hydrogen balloons filled the air. It was also a time of organization both of knowledge and of the professions: information was collected, classified, and disseminated through projects such as the *Encyclopédie* and the various nosological schemata that attempted to categorize disease, and the scientific and medical institutions and societies strengthened their regulatory hold on codes of conduct. Charting Mesmer’s early reception traverses both disciplinary and national boundaries to reveal the extensive network that underpinned the scientific and medical communities of the day, a powerful mechanism for promoting or discrediting new theories and practices. Through the published pamphlets and reports of the time, as well as the informal letters that comprised the day-to-day correspondence of notable contemporaries as diverse as the American author, scientist, and politician Benjamin Franklin and the Mozart family (Wolfgang Amadeus and his father Leopold), it is possible to gain an insight into how Mesmer and his work were perceived, as well as to examine Mesmer’s own attempts to describe, promote, and defend animal magnetism. In this chapter, I seek to integrate the multifarious discourses underpinning these complex debates in order to show how Mesmer and his work were symbolic of the social, scientific, and political revolutions that took place during this turbulent period of history.

In the first section of the chapter, after a brief review of his background and education, I will consider Mesmer's dissertation, submitted in 1766 for a doctorate of medicine at the University of Vienna, and place it within the context of the scientific milieu at the time. Following this preamble, I investigate why, after establishing a successful medical practice and comfortable prominent social position in Vienna, Mesmer decided to resurrect his thesis and mould its ideas into a controversial therapy that would bring him into conflict with the strict constraints of the imperial medical establishment, eventually driving him from the city under a cloud of notoriety. The second section focuses on Mesmer's relocation to Paris, where he found great success treating patients from across the social spectrum but was unable to gain approval for his treatments from the learned societies therein. These efforts culminated in a public dismissal of animal magnetism by the French Royal Commission, resulting in clashes, sometimes violent, between Mesmer's supporters and his detractors. Finally, I examine Mesmer's own approach and how he himself affected the way in which his therapies were received. This discussion takes note, too, of the role of the physician and its effects on the behaviour of patients and the outcome of their ailments.

Always a controversial figure, much has been written about Mesmer's art and life.¹ Records show that he came from a relatively humble background: his father is described variously as a gamekeeper or forester in the service of the Archbishop of Constance. He was raised in the village of Iznang on the German (then Swabian) side of Lake Constance, close to the Swiss border, an area that was at the time under the rule of the Austrian Empire. As part of a strong Catholic community, he attended a monastery school and in 1749, at the age of fifteen, he obtained a scholarship to the Jesuit college at Dillingen in Bavaria in the expectation of following a career in the priesthood.

¹ One of the most important sources of material relating to Mesmer is Robert Amadou's collection of documents attributed to Mesmer (1971). These include significant published texts, as well as pamphlets and letters. Amadou's published volume includes annotations by Jean Vinchon, the French psychiatrist who wrote *Mesmer et son secret* (1936), and Frank Pattie, the American psychologist and renowned Mesmer scholar. In addition, Pattie contributed a translation of Mesmer's doctoral thesis from Latin to French to the book. Subsequently, Pattie (1956, 1994) and George Bloch (Mesmer 1980), among others, have used Amadou's 'compendium' to provide excellent English translations of Mesmer's works and I make extensive use of these in this chapter. Other biographies of Mesmer include those by Richard Ince (1920), Rudolf Tichner (1928, in German), Margaret Goldsmith (1934), Donald Walmsley (1967), Vincent Buranelli (1975), and James Wyckoff (1975), which vary in their usefulness. Adam Crabtree's *Animal Magnetism, Early Hypnotism, and Psychical Research, 1766–1925: An Annotated Bibliography* (1988), now available online through Esalen Center for Theory & Research, contains a comprehensive annotated list of the principal publications concerning animal magnetism by Mesmer and his contemporaries, as well as those relating to works that emerged as a result of later studies inspired by the subject.

Margaret Goldsmith notes that while at Dillingen, Mesmer was introduced to the ideas of the Protestant philosopher Christian Wolff (1679–1754), whose work at the time was considered radical as it encouraged Enlightenment ideas, such as applying scientific thought to the Bible (Lehner 2010: 13; 2013: 73–4), and posits that this led him to question conventional religious beliefs (Goldsmith 1934: 42). This suggestion is reinforced by the fact that, although in 1754 Mesmer duly entered the University of Ingolstadt to complete his studies in theology, he abandoned the Church and transferred to philosophy. There is, however, no record of Mesmer taking his degree at Ingolstadt, although a Doctor of Philosophy qualification is attributed to him on the front page of his 1766 medical thesis (Goldsmith 1934: 44; Wyckoff 1975: 10). Frank Pattie considers that ‘it is reasonable to suspect that this degree was self-conferred’ (1994: 15). Some four years after Mesmer left the University of Ingolstadt, which Andrew Steptoe describes as a ‘chequered period’ (1986: 248), Mesmer enrolled at the University of Vienna in 1759 to study law. There was, however, to be a further change as Mesmer moved from the Faculty of Law to the Faculty of Medicine after his first year. This may have been, as Pattie suggests, because Mesmer was a Swabian, not an Austrian citizen, and so he ‘would have little chance of receiving a government appointment’ (1994: 8). If this were the case, Mesmer may have felt disadvantaged and discouraged, although his cousin Joseph, the educationalist, who was also from Swabia, was appointed Director of the Vienna Normal School as part of the reforms made by the Empress and seems to have experienced no such discrimination.² The above evidence suggests that Mesmer was uncertain of his future career direction and already displaying unorthodox tendencies in terms of his beliefs and career choices, particularly visualizing more of a

² James Van Horn Melton’s *Absolutism and the Eighteenth-century Origins of Compulsory Schooling in Prussia and Austria* (2003) refers to a Joseph Messmer [sic], stating that Joseph Mesmer was ‘a Swabian by birth’ and ‘a rector of the St Stephen Stadtschule’ (2003: 202). Although Van Horn Melton’s source notes that Joseph was no relation to ‘the physician and magnetist’, the correspondence of Leopold Mozart (Wolfgang’s father) in the summer of 1773 suggests otherwise, as he refers in his letters to Joseph Mesmer as ‘young Mesmer’, presumably to distinguish him from Herr von Mesmer, although there appears to be only one year’s difference in age between the two. The letters mention both families going away to the country together, which suggests that they were close at this point (Mozart 1938: 341–3, 346–50), but perhaps Joseph wanted to distance himself from Mesmer after the later scandals. Van Horn Melton describes how Joseph ‘Messmer’ proposed reforming the Viennese education system and professionalizing the teaching fraternity. The Empress Maria Theresa supported the suggestion that the St Stephen School, of which Joseph Mesmer was director, should become the Vienna Normal School, providing an annual subsidy of 3000 florins. The school opened in January 1771, providing not only classes in reading, writing, arithmetic and the catechism but also teacher-training (2003: 204).

future, and perhaps an easier life, in the medical profession, rather than in the clergy or the law.

Mesmer in Vienna

By the time Mesmer enrolled in the Faculty of Medicine at the University of Vienna in 1760, it had become one of the most prestigious places of learning in Europe. This transformation was brought about by the Empress Maria Theresa (1717–1780), a woman who at the age of twenty-three, on the death of her father in 1740, had inherited the impoverished, backward and divided Habsburg Empire. Having survived the War of the Austrian Succession (1740–1748), she believed that the way to secure her precarious position and stabilize the empire was by improving the educational and technological knowledge within her realm. Therefore, Maria Theresa embarked on a series of modernization policies. A key part of this educational reform was the appointment by the Empress of the promising Dutch physician Gerard van Swieten (1697–1772) in 1745 to undertake the reform of the antiquated Viennese medical system. Van Swieten moved the university from the authority of the Church to the jurisdiction of the State and, as noted by Mark Kidd and Irvin Modlin, ‘swiftly expunged the influence of the Jesuits and other religious orders from medicine and established formal training and examinations’ (2001: 444). Van Swieten also appointed fellow countryman Anton de Haen (1704–1776) to a senior position within the medical school. Both van Swieten and de Haen were Catholics who had studied under the famous Herman Boerhaave (1668–1734) at the illustrious University of Leiden, and while Leiden allowed Catholics to study at the university they were prohibited from becoming members of the faculty, which would have made progression for both van Swieten and de Haen difficult. With van Swieten’s management skills and de Haen’s expertise in clinical teaching, they followed Boerhaave’s Leiden model by setting up a hospital where students could examine patients, as well as adopting a system of bedside diagnosis, detailed case notes, and methods for following up patient progress (Forrest 1999: 1), therefore offering Mesmer a solid medical education and an insight into methodical record keeping.

After six years of study, Mesmer presented his medical thesis for examination in 1766. It was entitled *Physico-Medical Treatise on the Influence of the Planets* (Mesmer

1980: 1–20)³ and considered the effect that celestial bodies might have on animal bodies. In the ‘Foreword’ to the thesis, Mesmer openly acknowledges that his choice of topic is likely to result in disapproval, ‘people will frown on me [...] when they read the title of this small thesis’, as it may appear to be associated with work of astrologers, ‘who boast powers to predict events to come and to know the destiny of men and at the same time swindle them of the contents of their purse’ (Mesmer 1980: 3). Mesmer steers a course away from these irrational ideas and presents a more materialistic slant to his thesis by suggesting that a gravitational force would be at play between the celestial bodies and our own, so linking his ideas back to the groundbreaking work of Sir Isaac Newton (1643–1727) and his laws of gravitation. Biographers such as Margaret Goldsmith and James Wyckoff suggest that Mesmer’s thesis was received as ‘full of nebulous conjectures’ and was ‘an amusing topic for conversation’ (Goldsmith 1934: 48) but that ‘none of the medical faculty considered his ideas seriously’ (Wyckoff 1975: 13). The thesis primarily concerns itself with the work of the English physician Richard Mead (1673–1754), particularly Mead’s *A discourse concerning the action of the sun and moon on animal bodies; and the influence which this may have in many diseases* (1748).⁴ An eminent figure in London who counted Newton among his patients, Mead also studied at Leiden and was a great friend of Boerhaave, the mentor of both van Swieten and de Haen. Therefore, Mesmer’s choice of topic for his medical thesis is far from anomalous, despite having a title that harks back to archaic and controversial supernatural ideas, but is in fact a subject that would appeal to the tastes of his professors in the Viennese medical school. Simon Schaffer comments that using Mead’s text:

Represents an unusually immediate engagement with London doctrine, the Vienna school was in close touch with such tradition. [...] De Haen’s lectures were stocked with materials from his hero Thomas Sydenham [1624–1689, a

³ The Latin title was *Dissertatio physico-medica Planetarum Influxu* and was translated from Latin into French by Frank Pattie, appearing in Amadou’s collection of documents attributed to Mesmer (1971). The thesis was then translated from French into English by Bloch in 1980 (Mesmer 1980: 1–20). In a later work, *Dissertation on the Discovery of Animal Magnetism*, published in 1779, written when successfully practising in Paris, Mesmer refers to the title of his medical thesis as *De Planetarum Influxu in Corpus Humanum (The Influence of the Planets in the Human Body)* (1980: 46), so adding in explicitly the human body.

⁴ *De imperio solis ac lunae in corpora humana et morbis inde oriundis (A discourse concerning the action of the sun and moon on animal bodies; and the influence which this may have in many diseases)*, which was first published in London in 1704 and in translation into English in 1748.

pioneer of observational medicine] and subsequent London physicians, including Mead (2010: 160).

Boerhaave was also a great believer that physicians should have a thorough grounding in science. Mead's work was concerned more with physics than astronomy, and therefore Mesmer was emulating this model. However, Judith Pintar and Steven Jay Lynn point out that Mesmer went further than this and that much of his thesis was lifted intact from Mead's work (2008: 12). This view is endorsed by Frank Pattie's comprehensive analysis of Mesmer's thesis, as Pattie found passages that were taken verbatim from Mead with no acknowledgement to the source (1956: 284); there is just one reference to the 'distinguished Mead' in Mesmer's Foreword (Mesmer 1980: 3), although Pattie translates this as Forewarning (*Praemonitum*) (1956: 277). Pattie also compared the case studies in Mesmer's clinical section of the thesis and found that twenty-two of the twenty-three items came from Mead (282). Mesmer does include an original section in his thesis concerning the effect of the planets on meteorological and geological events (279), as well as an idea that builds on Mead's work regarding the existence of a medium through which gravity works on animal bodies. Here, Mesmer says that there is another kind of influence that 'depends directly on that force which, being prevalent in the vast spaces of the skies, affects the most interior portions of each material body' (Mesmer 1980: 14), a point noted by Pattie (1956: 279), Buranelli (1975: 35), and Schaffer (2010: 160). Mesmer called this influence animal gravitation, anticipating his later ideas on animal magnetism. There is another area of interest that appears in Mesmer's dissertation, the concept of 'harmony'. Mesmer remarks that human bodies 'are harmonized, not in a uniform and monotonous manner, but, as with a musical instrument furnished with several strings the exact tone resonates which is in unison with a given tone' (Mesmer 1980: 19). The concept of harmony, particularly in relation to musical notes, is reminiscent of the Harmony of the Spheres, a Hellenistic idea linking rhythmic sounds and planetary movement that dates back to the time of Pythagoras and had been explored by such luminaries as the astronomer Johannes Kepler (1571–1630), reflecting a desire to find order among the chaos of the natural world. Music was an element that would feature in Mesmer's future work, as would the unique disposition of an individual, which anticipates the question of why some patients responded to Mesmer's treatment and some did not and may refer to what was later labelled 'susceptibility' or 'imagination'. One other concept that appears in Mead's

work that Mesmer adopted in his later work with animal magnetism is the notion of ‘crisis’, also called by Mead ‘critical days’ (Mead 1748: 66–7), which refers to a turning point in the condition of a patient. Although it does not appear in his thesis, the ‘crisis’ was a key element in Mesmer’s therapies and it constituted one of its most contentious aspects of animal magnetism as it involved patients, often women, in a ‘critical’ state who exhibited signs of pain, distress, and even sexual ecstasy, thus incurring debate as to its moral propriety. While Mesmer’s thesis offers no great scholarship, and its reliance on Mead is questionable, Mesmer does attempt to consider how the human body might react to the invisible yet materialistic forces that were being investigated, for example magnetism, electricity, sound, and light, which were subjects at the forefront of scientific research. However, Mesmer is already displaying his inclination to take a defensive stance towards those who might criticize his work, noting that the reception of the thesis relies on the judgement of open-minded people who seek truth, not ‘those who read the works of others with the intention of finding fault therein’ (Mesmer 1980: 4). Whatever the controversies surrounding a modern examination of the thesis, Mesmer was finally awarded his medical degree in 1766, although by then he was a man in his thirties.

With his medical degree, Mesmer sealed his position in Viennese society through an advantageous marriage to a wealthy widow, Maria Anna von Posch, ten years his senior. He set about establishing a practice based in the well-appointed house in Landstrasse that was owned by his mother-in-law, who lived with them together with the twenty-year-old stepson whom Mesmer had acquired along with his wife. It seems that certain restrictions were put in place to protect the capital left by the first husband of the new Frau Mesmer, something that Steptoe considers to be indicative that the family felt that Mesmer was not entirely trustworthy (1986: 249). Biographers tend to differ in their views of Mesmer’s marital relationship, although Pattie comments on a letter where ‘Mesmer complained of his wife’s dullness (*Geistlosigkeit*) and her extravagance’ (1994: 28). Other accounts, such as the one offered by Vincent Buranelli, suggest that Frau Mesmer helped her husband to care for his patients and that Mesmer tried hard to be a good stepfather to her son (1975: 40).

In addition to his medical practice, Mesmer was able to indulge his passion for music. He was now a patron of the arts, and the spacious grounds of the Landstrasse house would often host social and musical events. He played the cello, the clavichord and,

most famously, the glass harmonica (also known as the armonica), which would become an integral element of his healing method as he believed that music helped the flow of the magnetic fluid, as mentioned in proposition 16 of his ‘Dissertation on the discovery of animal magnetism’ (Mesmer 1980: 68).

Leopold Mozart, father of Wolfgang Amadeus, who from his correspondence appeared to be a frequent visitor to the Mesmer household, commented in a letter to his wife in August 1773, ‘Do you know that Herr von Mesmer plays Miss Davies’s armonica unusually well? He is the only person in Vienna who has learnt it and he possesses a much finer glass instrument than Miss Davies does’ (Mozart 1938: 343). The Miss Davies referred to by Leopold Mozart was Marianne Davies (1744–1792), who became famous for her skill in playing the armonica or ‘musical glasses’, an instrument developed by Benjamin Franklin, who named it ‘armonica’ after the Italian word for harmony. Miss Davies left England for Europe in 1768, spending some time in Vienna, where she instructed the daughters of the Empress Maria Theresa (Gall and Finger 2000: 330–4; Mead 2017: 99–110). A year after Mesmer moved to Paris, he would invite Benjamin Franklin to hear him play the glass harmonica; however, the evening turned out to be more about animal magnetism than music, as noted in a letter to Franklin from his friend and companion that evening, the musician Madame Brillon (1744–1824) shortly after the event, ‘en paradis, [...] Mr Mesmer se contera [contentera] de jouer de l’harmonica, sans nous ennuyér du fluide Eléctrique (In paradise, [...] Mr. Mesmer will be content to play the armonica, without boring us about electric fluid)’ (Brillon de Jouy 1959: 8). Nonetheless, Mesmer had written to Franklin beforehand warning him of the lack of music and that he intended to talk about his ‘discovery’:

I will have the honor to receive you, as well as Madame de Brillon, with the greatest enthusiasm on the day that you have indicated. I regret being unable to give this lady all the satisfaction she desires, as my [glass] harmonica is not set up and cannot be before that time.

I will be flattered if I can put you in a position to recognize the substance and usefulness of my discovery, and if I can give you some proof of the deep respect

which with I am, Your Excellence, your very humble and obedient servant (Mesmer 1959a: 5).⁵

From this we can see that Mesmer took full advantage of the opportunity to discuss animal magnetism and was oblivious to Madame Brillon's boredom, although, given Franklin's work in science, Franklin himself may well have found the evening more stimulating. However, the Yale University translation of Madame Brillon's letter interprets the remark about Mesmer as, 'without harassing us about electric fluid', which suggests that Mesmer overstepped the mark.⁶ Mesmer wrote to Franklin again on 1 December 1779, commenting that as Franklin had shown an interest in the subject he would show him several other cases when they dined together on the following Wednesday (Mesmer 1959b: 186). It is unclear whether this dinner took place but these letters show that Mesmer and Franklin were in communication some years before Franklin was appointed to the Royal Commission that was to investigate animal magnetism in 1784. I will return to Franklin and the Royal Commission later in this chapter.

Although Mesmer had been conventional in his medical practice for some years, his methods underwent a change in 1774, a year after the very sickly Franziska von Oeseterlin (known as 'Franzl', and a family relation) arrived to stay with the Mesmers. Franzl suffered from fifteen different ailments, including hysterical fever, vomiting, and inflammation. Leopold Mozart was clearly most concerned about her state of health, writing on a number of occasions throughout July and August 1773 to his wife about 'Fraulein Franzl' and her precarious condition, which seemed to improve but then relapse (Mozart 1938: 341, 343, 346, 349, 350, 355). As conventional medical interventions of the time had failed to help his new patient, in July 1774 Mesmer approached Father Maximilian Hell as he wanted to try something different. Father Hell was a Jesuit priest and the Austrian Astronomer Royal, who produced artificial magnets as a hobby and had written a paper on the potential curative properties of magnets, having heard of their being used in France and England. Father Hell maintained that the magnets needed to be fashioned to fit the contours of the human body and had recently had an opportunity to test his theory on a baroness suffering from stomach ache who

⁵ The translation is given on the Yale University website:
<http://franklinpapers.org/franklin//framedVolumes.jsp> (accessed 1 May 2018).

⁶ The translation is given on the Yale University website:
<http://franklinpapers.org/franklin//framedVolumes.jsp> (accessed 1 May 2018).

had asked Father Hell to provide his magnets to help her. The Baroness declared herself 'cured' within four days and, although Father Hell was concerned that the pains may have gone of their own accord, he was nonetheless impressed by the Baroness's account and declared that the magnet had produced its effects 'by way of the nervous system' (Pattie 1994: 36). Father Hell knew of Mesmer's thesis with its ideas on the flow of animal gravity and was keen for him to try out the magnetic therapy. He supplied the magnets to Mesmer, who then applied them to the feet and chest of Fraulein Franzl, as he 'planned to establish in her body a kind of artificial tide by means of the magnet' (Mesmer 1980: 26). After experiencing painful burning sensations in her body at the site of the magnets, the symptoms gradually disappeared and, in time, she made a full recovery. Some years later, Wolfgang Amadeus Mozart shed further light on the case when he wrote to his father on 17 March 1781:

Where do you think I am writing this? In Mesmer's garden in the Landstrasse. The old lady [Frau Mesmer] is not at home; but Fraulein Franzl is now Frau von Posch [married to Mesmer's stepson]. Upon my word, I should scarcely have known her, she is grown so stout and fat. She has three children (Mozart 1866: 142).

The success of Fraulein Franzl's treatment caused a sensation but also resulted in a publication war between Mesmer and Father Hell. This was to be the first of many disputes that Mesmer would engage in with anyone who appeared to threaten his position as the founder of his therapeutic ideas. Documents relating to this dispute can be found in a 1778 edition entitled *Sammlung der neuesten gedruckten und geschriebenen Nachrichten von Magnet-Curen, vorzüglich der Mesmerischen* (A collection of the latest printed and written reports on magnetic cures, especially the Mesmeric). This publication is included in Adam Crabtree's 1988 annotated bibliography relating to key titles in animal magnetism, early hypnotism, and psychical research covering the period from 1766 to 1925. Crabtree describes *Sammlung* as 'a collection of journal articles and polemical pamphlets written by Mesmer, Father Hell and others about the nature and efficacy of magnetic healing', commenting that for some of those writings, this is the only remaining source and that Mesmer himself acknowledged the accuracy of the reproductions in this collection (1988: 4) (Mesmer et al. 1778: entry numbers 3–4, 9). The argument was triggered by a report, called *Schreiben aus Wien*, dated 28 December 1775 in *Sammlung*, that detailed Father Hell's

work with artificial magnets and described how he, rather than Mesmer, had applied the magnets to Mesmer's patient (Fraulein Franzl) (Mesmer et al. 1778: 1–3). In an attempt to put the record straight, Father Hell wrote an open letter, 'Unpartheyischer Bericht der allhier gemachten Entdeckungen der sonderbaren Wirkung der kunstlichen Stahlmagneten in verschiedenen Nervenkrankheiten' ('An impartial report of the discoveries made in Vienna of the curious effects of artificial steel magnets in various hereditary diseases'), dated 4 January 1775, to clarify that it was in fact Dr Mesmer who had applied the treatment (Mesmer et al. 1778: 9–16).

Father Hell's apologetic letter provoked an angry response from Mesmer, who published his 'Gedruckte Antwort des Herrn Dr Mesmer vom 19. Januar 1775/Printed answer of Dr Mesmer, January 19, 1775' in the newspapers and as a pamphlet (1980: 26). In this 'Printed answer', Mesmer claimed that the discoveries relating to magnetic cures were his own and had been included under the term 'animal magnetism [*magnetismum animalum*]' in his medical thesis of 1766 (Mesmer 1980: 25). In fact, as discussed earlier in the chapter, the thesis says that there is 'a force which is the cause of universal gravitation [...] which can [...] be called ANIMAL GRAVITATION' (14), and so the term animal magnetism was not used. Mesmer does use the word 'magnetism' just once in his thesis to explain the effect of animal gravity, which 'in the smallest particles of the fluids and solids of our organism maintains, relaxes, and agitates the cohesion, elasticity, irritability, magnetism, and electricity in the smallest fluid and solid particles of our machine' (14). This sentence in the thesis is very similar to one used in Newton's *Principia* (1687). Here, Newton says, 'by the force and action of which Spirit the particles of bodies mutually attract one another at near distances, and cohere, if contiguous; and electric bodies operate to greater distances, as well repelling as attracting the neighbouring corpuscles; and light is emitted, reflected, refracted, inflected, and heats bodies' (1846: 507). Newton uses the words attraction and repulsion, which are both features of magnetism, rather than the term itself (Pattie 1956: 280), suggesting that Mesmer was not introducing the idea of animal magnetism in his thesis. Therefore, Mesmer claimed that the term 'animal magnetism' existed in his 1766 thesis when it did not, which at best suggests that he was careless in his use of terms and, at worst, that he was deliberately suggesting that he had included the term in order to assert his prior ownership of the idea.

Mesmer goes on to say in his 'Printed answer' that his 'great number of very surprising observations [...] were collected in the presence of P. Hell and other respectable people' (Mesmer 1980: 27), but Father Hell was very perturbed by these claims and wrote to a friend that he had no idea that Mesmer would claim he was an eyewitness to certain experiments (Mesmer et al. 1778: 27). Mesmer continues his letter by announcing that he is able to magnetize a number of materials other than steel, such as paper, bread, wool, men and, rather surprisingly, dogs, stating 'in one word all that I touched' (Mesmer 1980: 28), so moving the curative abilities away from Father Hell and his magnets to imply that Mesmer himself could imbibe such necessary properties.

In this letter, Mesmer refers to individual susceptibility to magnetism:

[O]f the ten people who were gathered, there was one who could not be magnetized and who interrupted the communication of magnetism [...] On the other hand, there was one person among the ten who was so susceptible to magnetization that she could not approach within ten steps of the patient without causing her [the patient] ardent pains (Mesmer 1980: 28).

From this, it seems that a person's susceptibility was judged by the response that they elicited in other patients, which is a vague and subjective measurement of the effect and an example of a missed opportunity to quantify what this response was, as well as the effect of suggestibility in the patient themselves. The Royal Commission would later investigate this point, relating it to both gender and class. Mesmer, however, did not appear to show any curiosity about this phenomenon or desire to investigate it in more depth; rather, he seems to have just accepted what occurred as proof enough. In addition, Mesmer claimed that he 'roused jolts in any part of the patient that I had wanted to', even if he was hidden by a man or a wall and so not in direct communication or sight of the patient (Mesmer 1980: 28), but again there was no questioning of this test or its reliability or the possibility of even subtle suggestion to the patient. In his summing up, Mesmer talks of the 'harmony of the nerves', which, once restored, means that there is no further sensitivity to magnetism, leading, in the final paragraph, to another highly contentious statement:

The nature of our sensations is that they are nothing else but the perception of differences in proportions. When this is considered along with what I have just said, the reason is given why the effect of natural or artificial magnets, though

they act constantly upon us, is not felt except in the parts where the harmony is disturbed (Mesmer 1980: 29).

In other words, Mesmer says, albeit in a vague fashion, that the treatment is only effective in those who are ill, as those who experience no response to the treatment have nothing wrong with them. This rather catch-all explanation of why some patients might not feel anything when given the treatment would be open to question in later investigations.

In contrast, Father Hell shows his own abilities as a man of reason as he raised two key elements relating to Mesmer's magnetic treatment, both of which would recur throughout Mesmer's career: the role of the patient's imagination and the need for rigorous experimentation to verify the results. Father Hell explained this in a further letter dated 12 January 1775, this time to a friend, that was published in *Sammlung*:

Ich sage Ihnen demnach, daß die ersten Empfindungen in den Nerven, die die Patientinn von den aufgelegten Magneten empfunden hat, einen so tiefen und starken. Eindruck bey der Patientinn verursacht haben, dass diese Eindrücke, wenn die Patientinn auch nur von weitem einem magneten oder nach ihrer Einbildung einen magnetischen Körper anschaute, vermögend sind, sie glaubend zu machen, dass sie Stöße, Hiebe, Schläge, und dergleichen Sachen zu empfinden scheine. Wäre ich bey diesen Versuchen zugegen gewesen, so hätte ich ganz zuversichtlich den Herrn Doctor Mesmer von der starken Einbildungskraft dieser patientinn überzeugt. Sie fragen mich aber, wie ich es angestellet hätte? Sehen sie – Herr Doctor Mesmer sagt in seinem Schreiben zum Beispiel: er lade seine Flaschen mit der magnetischen Materie, die vermuthlich durch die Berührung der Patientinn ihr gewisse Stöße verursacht.

I am telling you thus that the first sensations in her nerves that the female patient experienced from the applied magnets made such a deep and strong impression that the patient only had to look at a magnet from afar, or see a compound that she believed to be magnetic, and this would be sufficient to make her feel the bumps, blows, punches, and the like of the treatment. If I had been present during these experiments, I would have been able to convince Doctor Mesmer of the strong imagination of this patient. How would I have explained it? Look – Doctor Mesmer says in his writing, for example, that he charges his bottles with the

magnetic material, which when they touch the patient, probably gives her a shock (Mesmer et al. 1778: 29).⁷

Therefore, Father Hell believed that the response in Mesmer's patient to the first magnet was genuine but he suggested that subsequent 'sensations' might be imagined when the patient saw the magnet or magnetic material again. The effect of the imagination and also of the power of the physician is alluded to, intentionally or otherwise, when Mesmer writes in his letter that he 'used the most accredited remedies to counteract these different ailments [of Fraulein Franzl], but only my attention, never losing sight of her, put me in a place to pull her away from the evident dangers of death' (Mesmer 1980: 26). The second issue that Father Hell raised was how to test the magnetic theories. He suggested carrying out experiments that involved magnetizing some bottles but not others, ensuring that this was done out of the sight of the patient. The patient would then be asked to identify the bottles that had been magnetized. Repeating these experiments would help to confirm the reliability of the result. Mesmer, however, refused to comply, believing that 'the cure was all the evidence anyone should need' (Waterfield 2004: 71). The definition of what a 'cure' signifies and why it is not an effective means of proof would resurface in later evaluations of animal magnetism. Similarly, in his letter, Mesmer lists the many positive results that he has obtained through magnetic therapies (Mesmer 1980: 28), but this tendency to use testimonials as proof of the efficacy of his treatments, rather than controlled experimental studies, caused conflict with the scientific authorities as his treatments underwent scrutiny. Therefore, at this early stage in the development of his theories of animal magnetism, Mesmer was already displaying an unshakeable belief in his therapies and an unwillingness to critique them.

Mesmer's public correspondence at this time is important as it marks the point at which he departed from orthodox treatments to deliver what appeared to be miraculous cures through magnetic therapies. However, these publications also mark the start of Mesmer's disputes in defence of his theories and therapies that were to become a key feature of his dealings with those who dared suggest that they might also have some knowledge on the subject, as in Father Hell's case, or to question the integrity of his discovery, even those in positions of authority. When Father Hell wrote to clarify his role in the magnetic treatment, Mesmer was swift to reply by publishing a declaration of

⁷ My translation.

his ownership of the ideas and the therapy relating to what he now called ‘animal magnetism’. This action also drew attention to Mesmer’s increasingly unorthodox ideas in a tightly controlled city that was keen to preserve the rational beliefs that it held dear, having worked long and hard to remove the more mystical and superstitious elements both from the Church and older pagan beliefs often held by those in the countryside; for example, van Swieten was involved in investigating and providing a rational explanation for the vampire myth that had prevailed in rural areas of the Habsburg Empire (Bräunlein 2012: 715).

Father Hell was a well-respected figure and a friend of the prominent and forward-thinking Dutch physician and physicist Jan Ingenhousz (1730–1799), a former student at Leiden who had been brought expressly from London by the Empress to Vienna to combat the frequent smallpox outbreaks and was now Court Inoculator. According to Mesmer, Ingenhousz had called on Mesmer, who took the opportunity to provide Ingenhousz with a demonstration of his treatment of Fraulein Franzl. Ingenhousz left saying that he needed no further proof, a statement that Mesmer took to mean that he was satisfied with what he has witnessed, but Ingenhousz then publicly dismissed Mesmer as a charlatan, attributing any positive result to suggestion, intentional or otherwise (Mesmer 1980: 51–4). This is an early example of Mesmer mistaking a polite withdrawal from his demonstrations for a statement of acceptance and approval. Mesmer was further disappointed by the cool reception given to the pamphlets and letters that he sent to the leading academies of science throughout Europe presenting his theories on animal magnetism. Only the Berlin Academy had investigated his work further but then dismissed it as lacking procedure and proof (Pattie 1994: 45–6).

Despite the unfavourable reception of animal magnetism among the Viennese and other European scientific establishments, Mesmer experienced great success with his treatments. The medical profession may have dismissed his work, but patients from all social strata flocked to his clinic in the Landstrasse residence. In order to accommodate the vast numbers of patients who arrived, Mesmer devised his famous baquet, which took the form of a round wooden tub about one-third of a metre high. It was lined with iron filings, which Mesmer had magnetized, and on top of the iron filings were placed bottles filled with magnetized water; sometimes the tub was filled with water as well. Iron rods ran up through the wooden top of the tub conducting the magnetic charge to the patients who held them as they sat around the tub, often joined together with ropes

and by holding hands (Wyckoff 1975: 47). Magnetized ponds, trees, and chairs extended the available facilities. Mesmer's treatments had a high rate of success, much to the chagrin of the medical fraternity. Mesmer published endorsements of his therapies from his patients to counteract all the negative response that he had received from the authorities. These included one from Professor Bauer of the Vienna Normal School, who published a highly complimentary pamphlet in March 1775, testifying to his successful treatment by Mesmer's methods (Pattie 1994: 44, 46–7). However, Mesmer's cousin, the educationalist Joseph Conrad Mesmer (1735–1804), was the Director of the Normal School and this could have led to the bias on the part of Professor Bauer. It also illustrates Mesmer's continuing reliance on testimony, with its implied subjectivity, rather than hard evidence.

As Mesmer's successes became well known, he was asked to visit wealthy patients outside Vienna, so he travelled a good deal. One of his most famous cases was his treatment of a thirty-year-old Hungarian nobleman, Baron Horecky de Horka, who was suffering from spasms of the throat. In Vienna, the doctors, who included van Swieten and de Haen, could find nothing wrong and considered it a nervous complaint, probably imaginary and not serious, but de Haen suggested that he try Mesmer's magnetic treatment. Therefore, the Baron invited Mesmer to visit his estate in the country to treat him. The details of the case were recorded by a young German tutor in the household, Ernst Seyfert (Ellenberger 1970: 103).⁸ Seyfert's record provides an insight into the methods that Mesmer employed; for example, when the Baron developed a dangerous fever, it transpired that the night before Mesmer had told the Baron that he would experience a crisis on the next morning and warned the Baron's wife not to be alarmed by this, therefore there was an expectation that such events would occur. The trauma of the crisis was too much for the Baron and, unable to face the prospect of repeating the experience, he refused any further treatment by Mesmer, although he apparently never again experienced the throat spasms. While Mesmer was at the Baron's castle, patients

⁸The account was unearthed by the German physician and writer Justinus Kerner Justinus Kerner (1786–1862), who had a long-term interest in mesmerism. Kerner travelled to Meersburg, the place where Mesmer had lived for the last 20 years of his life, collecting documents and information about people who had known him. Ellenberger cites Kerner's 1856 biography of Mesmer: *Franz Anton Mesmer aus Schwaben, Entdecker des tierischen Magnetismus. Erinnerungen an denselben nebst Nachrichten von den letzten Jahren seines Lebens zu Meersburg am Bodensee* [Franz Anton Mesmer from Schwabia, the discoverer of animal magnetism. Memories of him and reports of the last years of his life in Meersburg on Lake Constance]. Frankfurt: Literarische Anstalt, pp. 19–45.

flocked to see him and ask for his help. Word of the positive outcomes reported by those receiving the magnetic therapies soon spread and Mesmer was celebrated as a legendary healer.

Mesmer was always careful to ascribe any success to natural forces rather than to any miraculous influences, although this emphasis would become less clear later in his career when the Society of Harmony was set up expressly to protect the secrets, and exclusivity, of animal magnetism. A chance for Mesmer to reinforce this distinction between science and mysticism presented itself when the Elector of Bavaria asked him to come to Munich in late 1775 to investigate the Catholic priest Johann Joseph Gassner, who used a form of exorcism to relieve patients of their ailments. Having observed Gassner, Mesmer believed that his cures were genuine and bore similarities to his own, concluding that it was in fact the force of animal magnetism inherent in Gassner that was at work and allowing natural healing to take place, rather than any supernatural force, although Gassner himself was unaware of the great magnetic reserves that he held within him. This interpretation also served to convince Mesmer that 'iron magnets were not essential for producing crises and curative effects; the physician's body that was the true magnet for augmenting and controlling animal magnetism' (Crabtree 1993: 9), and therefore he would henceforth use his own body as a conduit to restore health and harmony.

It was in early 1777 that Mesmer began what was to be his most famous, or possibly infamous, case. An eighteen-year-old pianist, Maria Theresa Paradis, who had been blind from the age of four, was sent to Mesmer by her parents for treatment. Although young, Miss Paradis had established herself as a talented musician and it is likely that Mesmer knew her from her concerts, especially in his capacity as a patron of the arts. Miss Paradis was also a protégée of the Empress and received a pension from her to develop her music. Her blindness was believed to have had its origin in a nervous condition and the treatments that she had already experienced, including electrical shock therapy, were harsh and ineffective (Forrest 1999: 13). This use of medical electricity in the eighteenth century is discussed by Sherry Ann Beaudreau and Stanley Finger, where they make particular reference to the advances in the area made by Benjamin Franklin and Jan Ingenhousz (2006: 330–45). The finest physicians available were unable to control the twitching around her eyes and the numerous 'hysterical' symptoms that she experienced, and so Mesmer was proposed as a last resort. Miss

Paradis moved into the residential clinic that was now part of Mesmer's house in the Landstrasse (Crabtree 1993: 10–11), which meant that with her illustrious connections and the medical elite of Vienna watching, Mesmer's magnetic therapy was under scrutiny. Mesmer gave her case 'a great deal of personal attention, solicitous care, and patient explanations' (Crabtree 1993: 10–11) and, given all the painful treatments she had received, it must have been a great relief for Miss Paradis to find herself in such a soothing environment. Within a month it was reported that Miss Paradis' sight was showing signs of improvement, as she could distinguish shapes and colours (Mesmer 1980: 73–5). Mesmer was careful to display the patient's progress, exhibiting her restored sight to the general public, as according to Mesmer 'crowds flocked to my house to make sure for themselves' (Mesmer 1980: 59). However, some problems accompanied her new-found visual ability: Miss Paradis felt disorientated and self-conscious as she was now aware of having an audience watch her, and so her music suffered, thus threatening the financial support that she received from the Empress. This, in turn, brought about often turbulent relations between family and physician; Mr Paradis, at one point, entered the clinic brandishing a sword, although her parents publicly acknowledged the success of Mesmer's methods (Mesmer 1980: 59–62) and Mesmer later published a testimonial written by her father (Mesmer 1980: 71–6), although this testimonial reads more like a medical case study than a father's account, for example 'the motor muscles of her eyes had not hitherto been in use' (Mesmer 1980: 75), so it is difficult to ascertain how much was actually written by Mr Paradis. However, the observers from the medical faculty and Ingenhousz, who earlier had spoken out against Mesmer during the fracas with Father Hell, denied that Mesmer's treatments were effective. There were also accusations made about the improper relationship that developed between Mesmer and his patient, which further alarmed her parents (Forrest 2002: 302) and alerted the strict moral censors of the city, especially since the Empress held strong religious and moral views. Even Mesmer's old friend and fellow Swabian Anton Störck, who had worked his way up to become Head of the Medical School and chief court physician, turned against him, urging him 'to put an end to the imposture and to restore Miss Paradis to her family if this can be done without risk' (Pattie 1994: 62). Of course, Mesmer contested this claim and kept Miss Paradis in his care for another month, albeit with a court physician in attendance. The visitors who came were suitably impressed and happy to add their testimonies in support of what

they had seen. However, after six months of treatment, Miss Paradis' parents forcibly removed her from Mesmer's care: she remained blind for the rest of her life but kept the imperial pension. The case badly affected Mesmer's reputation and he was told by the Vienna Medical Faculty to stop using animal magnetism as a therapy. Shortly afterwards, Mesmer left Vienna, although his later writings reveal that he did not want to go and felt 'wearied by my labors [...] and still more so by the continued animosity of my adversaries', as noted in his 'Dissertation on the discovery of magnetism' in 1779 (1980: 64).

Mesmer did not go straight to France but, as Darnton says, 'wandered alone in a forest for three months like a Rousseauite savage: "I felt closer to nature there ... Oh nature, I cried out in those paroxysms, what do you want of me?"' (Darnton 1968: 117). In times of trouble, as will be seen later in the chapter, Mesmer would remove himself from the public view, which in some ways accounts for the mysterious four years before his university studies in Vienna, where no record exists of his whereabouts. Mesmer's words cited by Darnton are reminiscent of those spoken by someone on a grand mission, which reflects how Mesmer must have seen himself, as when he arrived in Paris in February 1778, he vowed to 'pass on to humanity, all the purity that I [Mesmer] had received from Nature, the inestimable benefaction that I had in hand' (Darnton 1968: 117). Mesmer quickly set about establishing a practice that was soon full of the rich and titled of Paris who were keen to try the new animal magnetism therapies for themselves.

Frau Mesmer did not accompany her husband on his trip, possibly because she had to see to her properties and domestic duties, but it seems that he never saw her again and there are no records of any correspondence between the two. Mesmer appeared to have had little or no contact with his family or friends in Vienna and, once more, the Mozart family's correspondence offers some insight into Mesmer's personal life and character. As mentioned earlier in the chapter, Wolfgang Amadeus Mozart had written to his father in 1781 from Vienna, some three years after Mesmer had departed, about the robust health of the now-married Fraulein Franzl. He wrote again, this time to his sister, on 22 December of the same year, saying 'that I have only been once at Frau von Mesmer's; the house is no longer what it was' (Mozart 1866: 108), as the family had apparently fallen on hard times. Mozart's friendship continued with Mesmer's cousin Joseph, though, until at least 24 March 1781, when Mozart wrote to his father: 'Herr von Mesmer (normal-school inspector) and his wife and son send you their

remembrances' (Mozart 1866: 143). It is perhaps of note that Joseph Mesmer is now referred to by Mozart as Herr von Mesmer rather than the 'young Mesmer' as he had been in 1773. It is also of interest that Mozart explicitly draws attention to which Mesmer he is talking about by parenthesizing 'normal-school inspector', so distinguishing him from the physician. Joseph Mesmer was also much involved with the Viennese music circle (Steptoe 1986: 251) and so would have been an advantageous contact for Mozart.

Mozart's time in Paris also raises questions about Mesmer and his relationships. At the time of Mesmer's departure from Vienna, Mozart was also planning a trip to Paris. Mozart wrote to his father Leopold in a letter dated 10 December 1777, 'I beg you, if possible, to try to procure for me, either through Herr Mesmer at Vienna, or some one else, a letter to the Queen of France' (1866: 84), suggesting that they were still in contact at this point and also, in Mozart's eyes at least, that Mesmer had the necessary leverage to achieve this, although by this time it is likely that Mesmer had already departed Vienna. Mozart arrived in Paris in March 1778 aged twenty-two and was accompanied by his mother, as his father had been compelled to stay in Salzburg. This was one month after Mesmer had set up his practice in Paris and just three months after Mozart had sent the letter to his father requesting Mesmer's help. There appears to have been no meeting or correspondence between the two men during Mozart's six-month stay, as there is no mention of Mesmer in Mozart's frequent letters to his family. This lack of contact is particularly strange as Mozart suffered considerable hardship as a struggling musician in Paris, in contrast to Mesmer who had established himself with aplomb and had wealthy, prestigious patients queuing to receive his treatments. Given their family friendship and Mesmer's patronage in Vienna, Mesmer would seem to have been an obvious person for Mozart to turn to, especially when in the early summer Mozart's mother became ill and died a few months later, but there is no record of any communication. This could support Steptoe's theory that after Mesmer left Vienna for France, his contact with the Mozart family ceased as Mesmer was deemed to have abandoned his wife and left under a cloud of scandal. If there was bad feeling between the two, this could explain Mozart's famous but derisory portrayal of Mesmer as a quack in his opera *Così fan tutte*, which was first performed in Vienna on 26 January 1790, some years after the findings of the Royal Commission had made Mesmer a figure of ridicule and after he had effectively retired (Steptoe 1986: 252).

Mesmer in Paris

Robert Darnton called pre-revolutionary France the ‘golden age of popular science’ (1968: 29) and Paris was at its epicentre. From balloon flights to the hoax ‘elastic shoes’ that would allow the wearer to walk on water, and the von Kempelen chess-playing automaton, nothing was too outlandish to capture the imagination of the general public. The conclusion drawn by Darnton is that:

The reading public of that era was intoxicated with the power of science, and it was bewildered by the real and imaginary forces with which scientists peopled the universe. Because the public could not distinguish the real from the imaginary, it seized on any invisible fluid, any scientific-sounding hypothesis, that promised to explain the wonders of nature (1968: 23).

The city was full of opportunity and welcomed the scientific-sounding therapy of animal magnetism, especially as word of Mesmer’s remarkable healing powers had preceded him. Mesmer entered Paris in early 1778 and set up his clinic in the prosperous area of the Place Vendôme, ‘assisted by his footman, Antoine, who was trained to apply animal magnetism’ (Crabtree 1993: 12). Mesmer’s arrival would not have gone unnoticed by the medical and scientific fraternities; they would have been at least as aware of him, as were the general public, and would have known of the Paradis scandal as well as of his controversial ideas that had precipitated his departure from Vienna.

While the people of Paris were free to explore new theories and numerous sensational inventions without censorship, the medical fraternity kept a tight control over medical practitioners within the city. Paul Delaunay in his book on the Parisian medical world of the eighteenth century describes how even experienced physicians who had obtained their degrees outside Paris were expected to retake the examinations in order to treat patients, as studies at other medical faculties only accounted for half of those required by the faculty of Paris (1906: 8–9). Mesmer, however, had consulted no one before opening the doors of his therapy rooms. It was not long, though, before Mesmer brought himself to the attention of the authorities as he sought to demonstrate animal magnetism to an audience who would have the influence to secure him access to the institutions; for, while Mesmer had the public’s support for his treatments, what he really wanted was the endorsement of his methods by the French medical and scientific establishment, namely the Royal Academy of Sciences, the newly formed Royal

Society of Medicine, and the Faculty of Medicine. Therefore, his next steps were to secure their backing.

Despite the controversy surrounding his methods, when Mesmer left Vienna he was provided with a letter of recommendation from the Minister of Foreign Affairs to the Austrian ambassador in Paris (Pattie 1994: 66). The ambassador, however, turned out to be ‘prejudiced against animal magnetism’ (Pattie 1994: 78) and so was no help. Meanwhile, Mesmer did manage to obtain an invitation to one of the famous dinners held at the house of the wealthy and radical German-born Baron d’Holbach (1723–1789). These weekly dinners were attended by prominent *philosophes*, known as the coterie *holbachique*, a term coined by the writer and philosopher Jean-Jacques Rousseau (1712–1778), who was an occasional attendee (Kors 1976: 9). Having secured an invitation, Mesmer took the opportunity to provide a demonstration of animal magnetism. However, the experiments were not a success and no further invitations were extended to Mesmer by Baron d’Holbach. It is notable, though, that the Marquis de Chastellux, a soldier, writer, and member of the Académie Française, who was a regular visitor to the salon from 1764 until he left to take part in the American War of Independence in 1780, became ‘an early and vociferous supporter of Mesmer’ (Kors 1976: 26, 69). Chastellux was also one of the founding members in 1781 of the Society of Universal Harmony, an exclusive organization that promised to reveal the secrets of Mesmer’s animal magnetism in return for a large subscription (see Darnton 1968: 77, 79). Another member of the coterie *holbachique* was Jean-Baptiste Le Roy (1720–1800), who was also a physicist and the director of the Academy of Sciences from 1773 to 1778, and, undeterred by his reception at the house of Baron d’Holbach, it was to Le Roy and the Academy of Sciences that Mesmer turned next. Le Roy agreed to investigate Mesmer’s treatments but wanted experimental proof, not testimonies. With reluctance, Mesmer agreed to magnetize a gentleman suffering from asthma at the home of Le Roy, but this was not a successful demonstration either. Le Roy then suggested to Mesmer that curing patients would be the best method of substantiating his claims. Mesmer duly set up a clinic outside Paris, installed his patients and waited. After three months, Mesmer wrote to Le Roy inviting the Academy to come and see the results of his work. Le Roy read the letter to the Academy, which decided to take no further action, as the minutes of the meeting on 29 August 1778 record: ‘J’ai été chargé de lui répondre que l’Académie ne doit point s’en mêler/I was

instructed to respond to him [Mesmer] that the Academy would not get involved' (Maindron 1888: 59).⁹

The networks of the scientific and medical communities were extensive and close knit. Not long after Mesmer arrived in Paris, Benjamin Franklin (1705–1790), who served as the newly independent America's ambassador to France, received a letter dated 5 October 1778 from Mesmer's old adversary in Vienna, Jan Ingenhousz, mentioned earlier in the chapter. Ingenhousz was a good friend of Franklin, it was Franklin who proposed Ingenhousz's membership of the Royal Society in London in 1769, and they had a long-standing relationship of shared scientific interests. In the final paragraph of the letter, Ingenhousz writes:

I hear from [Felice] Fontana [1730–1805, an Italian physicist] the Vienna conjuror Dr. Mesmer is at Paris, that he has been presented to the Royal academy, that he still pretends a magnetical effluvium streams from his finger and enters the body of any person without being obstructed by walls or any other obstacles, and that such stuff, too insipid for to get belief by any old woman, is believed by your friend Mr. Le Roy, who protects him and will recommend him in London, where he has a mind to exercise his magnetical effluvia (Ingenhousz 1988: 506).

Such comments would have been very damning to both Le Roy and Mesmer. In fact, Le Roy, after giving Mesmer a chance to prove himself to the French Academy, had distanced himself from animal magnetism. Le Roy would also serve, along with Franklin, as a Commissioner on the investigation of 1784 ordered by King Louis XVI (1754–1793) into animal magnetism. Ingenhousz's correspondence to Franklin illustrates how persistent was Ingenhousz in his hostility towards Mesmer and also shows how the scientific and medical community kept in close contact. Mesmer was aware of the negative accounts that had followed him from Vienna, noting in his 1779 'Dissertation on the Discovery of Magnetism', published a year after his arrival in Paris, that 'my adversaries, who were ever on the watch to harm me, lost no time in spreading warnings about me on my arrival in France' (1980: 65). However, Mesmer did not let these bad reports keep him from his mission to gain approval for his methods.

Mesmer next approached the Royal Society of Medicine but soon entered into an acrimonious dispute with its members when he refused to have his methods evaluated by a commission, although such an assessment was standard practice before the Royal

⁹ My translation.

Society could grant a patent or licence for a treatment (Pattie 1994: 83). Having failed with two of the three main institutions, there remained just the prestigious Faculty of Medicine, but they too were sceptical of animal magnetism. Although Mesmer was tireless in his attempts to convince the institutions to consider his work seriously, his petitions were hampered by the rude and arrogant way that he dealt with those he encountered, particularly when their views and opinions differed from his own. Mesmer refused to work with the institutions to evaluate his theories and treatments in any depth, but then he himself exercised no such examination of his own work, he just accepted what he saw.

There was one man who had faith in Mesmer's method, namely Charles Deslon (sometimes written as d'Eslon), a highly respected and senior member of the Faculty of Medicine, as well as the personal physician to the brother of King Louis XVI. However, even having Deslon as an advocate did not make animal magnetism any more palatable to the Faculty. Darnton talks of Mesmer's 'impenetrable German accent' (1968: 47) and his bad French, which may have added to the problems of trying to explain his theories and treatments to the Parisian institutions, although Crabtree notes that Deslon translated and edited Mesmer's work (1988: 7), which would have made it more accessible to the French. This seems to have been common practice for Mesmer as in later years other disciples, such as Bergasse, would prepare his written material.

With Deslon's help, in an attempt to explain his work and to defend himself against the negative reports that were circulating, Mesmer published his 'Dissertation on the discovery of animal magnetism' in 1779 (1980: 43–76). As noted earlier in the chapter, this document also contains much about the conspiracies that he feels compromise his work, mentioning 'the relentlessness of my enemies' (1980: 64). Therefore, while this is an account by Mesmer of his theories, he does make clear his feelings of mistreatment by the institutions and makes frequent allusion to his enemies, which detracts from his ambition to establish himself as a professional man and is another instance of Mesmer using his publications to express his dissatisfaction with the lack of approval for his treatments. The material in the Dissertation is still vague and lacks detail in terms of the method; for example, when describing the patients that he 'cured', Mesmer notes the symptoms, which would have been part of his medical training under de Haen, a pioneer in patient case studies, but offers no precise details of the treatment given, the effects of the treatment, or the longer term outcome.

To explain animal magnetism in scientific terms, Mesmer included his ‘Twenty-Seven Propositions’ at the end of the ‘Dissertation’. This list boils down to stating the existence of a subtle physical fluid that exerts an influence among material bodies, whether heavenly or earthly, rather as described in his medical thesis and echoing his earlier ideas on animal gravity. He says that this fluid is subject to mechanical laws, although these may be laws that are as yet unknown, and disease results when the fluid is blocked or unbalanced, which can be rectified by techniques to restore the equilibrium, invoking a crisis and thereafter a cure, which form the basis of his animal magnetism therapies. Again, Mesmer attempts to relate his theories in the key areas of scientific interest of the time. Gravity is mentioned in Propositions 1 and 2, and magnetism is referred to throughout the propositions and particularly in Propositions 9 and 20. Electricity is also alluded to in Proposition 17 through referral to storage and transportation of magnetism, much like a modern-day capacitor (although in Mesmer’s time it would have been a Leyden jar); light features in Proposition 15, which discusses the use of mirrors and how animal magnetism is ‘intensified and reflected by mirrors, just like light’ (1980: 68); and sound, in Proposition 16, communicates, propagates, and intensifies animal magnetism. Through these allusions to known fundamental forces, Mesmer attempts to ground animal magnetism in the materialistic science of the day. However, he is still proposing a therapy based on an enigmatic fluid that cannot be detected or measured, but produces observable effects on his patients. Mesmer comments in the ‘Dissertation’ that ‘man is by nature an observer’ and while he then digresses into a philosophical reflection on the senses that is rather out of place in a document to support his treatments, he nonetheless considers how important it is for a person to pay attention to his surroundings and to hone that skill in order to ‘form himself; and the perfection of his faculties depends on its more or less constant application’ (Mesmer 1980: 44). Despite Mesmer’s lack of information about the precise treatments, as Derek Forrest notes, Mesmer ‘must have been a sensitive observer to note the importance of the general ambiance and the behaviour of himself and his co-therapists in helping to induce crises’ (1999: 67). He would have been trained to observe his patients as a medical student under de Haen as part of his record-keeping duties, a skill that would become a key tool of the physician, as will be seen later in the discussions of Conan Doyle and hypnotism in Chapter 4. Observation is an important concept both in science, in terms of the importance of close scrutiny, and in

the practice of animal magnetism, as much is made of the use of the magnetist's 'imperial eye' (Darnton 1968: 8) and its effect on the patient.

Deslon's continued petitioning of the Faculty of Medicine to secure a hearing for Mesmer eventually paid off. The Faculty proposed that a blind controlled trial be carried out on one of Mesmer's most susceptible patients. The patient would be blindfolded and twenty-four people, some doctors, some not, would, together with Mesmer, line up and pass by her. The observers would keep records and see whether Mesmer's presence had an effect. Mesmer, however, rejected this suggestion on the grounds that such a test was insulting. Mesmer did come up with a suggestion of his own, one that would now be called a randomized controlled trial. Here, twenty-four patients, suffering from any illness bar venereal disease, would take part and be divided into two groups. Of these, twelve would be treated by Mesmer and twelve by members of the Faculty. The patients would be assigned to groups by drawing lots (Pattie 1994: 98–100). This could still allow suggestion to come into play, as the patient would be aware of the type of treatment given, but would allow the improvement or otherwise in the individual's condition to be assessed. The Faculty agreed to consider this, but while they were deliberating, Deslon wrote his own interpretations of animal magnetism, which included his understanding of the technique, his experience of its efficacy, and his belief of its value as a treatment (Crabtree 1988: 7–9). The Faculty viewed Deslon's publications as an insult to the teachings of the medical school and sound practices of medicine (Crabtree 1993: 20). They then refused any further consideration of animal magnetism and threatened Deslon with expulsion from the Faculty if he did not retract his allegiance to Mesmer. Deslon remained a staunch supporter of animal magnetism and, after protracted periods of suspension, was eventually removed from the Faculty. It is interesting to note that in his 'Observations sur le magnétisme animal', published in 1780, Deslon links imagination to Mesmer's therapy, just as Father Hell had done several years earlier in Vienna:

Si M. Mesmer n'avoit d'autre secret que celui de faire agir l'imagination efficacement pour la santé, n'en auroit-il pas toujours un bien merveilleux? Car si la Médecine d'imagination étoit la meilleure, pourquoi ne ferions-nous pas la Médecine d'imagination?

If M. Mesmer had no other secret than that of using the power of the imagination to improve health, would that not be marvellous? For if the imagination were

more effective than other medicine, why would we not use it? (Deslon 1780: 46–7).¹⁰

Imagination would be a key finding of the Royal Commission into animal magnetism in 1784, where Deslon's practice rather than Mesmer's was used for the investigation, but by then Mesmer had embarked on an acrimonious dispute with Deslon, which will be discussed later in the chapter. This decision of the Faculty to decline any further evaluation of animal magnetism made Mesmer even more intransigent. As Iain Donaldson pointed out, while in 1780 Mesmer was prepared to propose a prospective trial of his treatment in conjunction with the Faculty (i.e. following the progress of a group of patients receiving a course of animal magnetism), a year later Mesmer was no longer willing to do this but insisted that any trial of the effectiveness of his animal magnetism should be retrospective (Donaldson 2005: 574). In other words, Mesmer was falling back on his mantra that it was the outcome that was important, not investigation of the method or a critical examination of the results. This serves to explain Mesmer's lack of cooperation in allowing his methods to be put under scrutiny and his refusal to take part in the later trials.

Mesmer's aristocratic patients, who included those close to the Queen of France, Marie Antoinette, were alarmed by his talk of leaving Paris. As a result, the monarchy asked its government to provide financial inducements to encourage Mesmer to stay. Mesmer refused, affecting offence that he could be persuaded by money, and felt it necessary to make his feeling known in his *Précis historique des faits relatifs au magnétisme animal jusques en Avril 1781*, which, according to Crabtree, was translated into French from the German and edited by Deslon (1988: 17); a copy of the *Précis* is reproduced in Robert Amadou's 1971 collection of works published by Mesmer. The *Précis* itself contains little in the way of scientific or medical detail but puts Mesmer's views on the various disputes that he had encountered in both Vienna and Paris in trying to gain recognition for his therapy. These views display his anger and resentment of his treatment by the authorities. Mesmer makes much of circulating his polemic by listing within the text not only the institutions where he sent copies of his book but also the number of copies despatched. These institutions are a roll-call of the key centres of learning across Europe, America, and Russia. Franklin was also sent a copy in Paris. It is difficult to see how such a publication would meet Mesmer's objective to have

¹⁰ My translation.

animal magnetism accepted as a bona fide treatment as the scientific institutions in other cities, just as in Paris, would require evidence to support a therapy rather than an attack on well-respected figures of the French scientific establishment.

The *Précis* also reproduces the text of an inflammatory letter that Mesmer sent to Queen Marie Antoinette on 27 March 1781 (Mesmer 1971: 215–20). He wrote this letter in response to the government's offer to keep him in Paris. It is shocking as the letter not only criticizes the treatment that he has received from the government but also seems to attribute blame to Marie Antoinette for the humiliation that he feels he has experienced at the hands of the institutions. He does this by repeatedly using the word 'your': 'votre Académie des sciences, votre Société royal, et votre Faculté de médecine de Paris' ('your Academy of Science, your Royal Society, and your Paris Faculty of Medicine'). Mesmer then goes on to criticize the queen's brother in Vienna, Joseph II (1741–1790), who was Holy Roman Emperor and had become ruler of the Habsburg Empire after the recent death of the Empress Maria Theresa. One of the most surprising aspects is the threatening language that Mesmer uses in the letter, for example when he says:

Car il saura que s'il est beaucoup de circonstances où les Rois doivent guider l'opinion des peuples, il en est encore un plus grand nombre où l'opinion publique domine irrésistiblement sur celle des Rois.

For he [Joseph II] will know that if there are many circumstances in which kings must guide the opinion of the people, there is still a greater number in which public opinion irresistibly dominates that of kings (Mesmer 1971: 189).¹¹

Mesmer then states: 'Eh bien, quand l'opinion publique aura décidé, il me rendra justice' ('Well, when public opinion has decided, it will do me justice') (Mesmer 1971: 189), so suggesting that the support that Mesmer enjoyed from the general public could be turned against the monarchy, offering a strange foreshadowing of the fury of the French mob that would take up arms against King Louis and the *ancien régime*. Finally, Mesmer asks Marie Antoinette to use her influence over her brother and husband, as he hopes that, 'Elle ne dédaignera pas d'user de son pouvoir sur l'esprit d'un Frere et d'un Époux pour m'attirer leur' ('She [the Queen] will not disdain to use her power over the spirit of a brother and a husband to ensure their good will towards me') (Mesmer 1971:

¹¹ My translation.

190). The tone of the letter would have been unlikely to engender any form of favour, particularly given that he was addressing the Queen of France and the sister of the Holy Roman Emperor, and, although it expresses Mesmer's frustration, it also illustrates how his tirades defeated his purpose. There is no record of any reply to this letter; however, it would have been a particularly dangerous publication both for the monarchy and for Mesmer, especially given Mesmer's wide circulation of the *Précis*, in which the letter was reproduced. Ellenberger describes Mesmer's 'over-sensitive and unstable character' (1970: 61) and this letter displays a certain recklessness for, as Jean Vinchon, an early biographer of Mesmer, said: 'Twenty years before, this letter would have meant imprisonment in the Bastille' (Vinchon 1936: 68). The fact that this letter did not result in Mesmer being charged with treason is perhaps an indication of the influence that he still held over his wealthy patrons, despite his lack of support from the scientific and medical institutions. It also reflects the weakness of the monarchy in its inability to control such open criticism, a trait that would cause wider problems in the coming years.

After his failure to gain approval from the institutions and the events surrounding his contentious letter to the queen, Mesmer left Paris in the summer of 1781 for the health resort of Spa in the Ardennes mountains, a town famous for its natural springs. However, he returned committed to his work and also to a new idea that would help him to generate more income from his therapy as well as promote it. Mesmer had a long association with the Freemasons. Melvin Gravitz comments that 'Mesmer had been a member of the *Wahrheit und Freiheit* Masonic lodge, as were others of his Vienna circle, such as Wolfgang Amadeus Mozart' (1997: 267). There was nothing unusual in this: Franklin had been a member of the Masons since he was a young man in Pennsylvania and had joined the Lodge of Nine Sisters (*La Loge des Neuf Soeurs*) in Paris, becoming Master in May 1779.¹² However, Mesmer, together with two of his patients, the lawyer Nicolas Bergasse and the banker Guillaume Kornmann, created a

¹² Among its various activities, the lodge under Franklin became a centre for Masonic support for the American Revolution, helping to secure financial aid, which according to R. William Weisberger was something that 'flagrantly violated Masonic regulations' (1986: 173), but this was never questioned by Grand Orient authorities. Antoine Court de Gébelin (1728–1784) was a member of the Nine Sisters; a learned man who supported religious tolerance and was a scholar of ancient language and myth, he was also, in the last year of his life, a supporter of animal magnetism, although it failed to cure him. Weisberger also cites Brissot de Warville, the radical writer who would convert to animal magnetism in 1785, as also being a member of the lodge (1986: 173–4).

movement that bore similarities to the Masonic lodges, the Society of Harmony.¹³ The idea was that the Society of Universal Harmony was open to disciples who paid a large subscription to receive instruction in Mesmer's methods, with Mesmer receiving a guaranteed portion of the fees. Mesmer also insisted on a formal written agreement that his pupils did not carry out any treatment or instruction in the method without his express permission, to preserve the secrecy of his therapy. However, Mesmer did allow the creation of branches of the Society of Harmony and centres sprang up throughout France. The fee to join was high and the list of members included dukes, marquises, noblemen, abbots, and doctors, who were already wealthy in their own right and intend to practise not for financial gain but out of service to humanity. Darnton references the diary of the Baron de Corberon who documented the Society's meetings, describing them as having 'a strong masonic influence' and lessons that resembled the 'scientific lectures in the Parisian museums' (1968: 76).

Mesmer spent more time away, and during one of these trips Deslon set up his own practice so that patients could still receive treatment. When Mesmer heard that Deslon had done this, he returned in a state of fury claiming that no one else could administer animal magnetism. This led to a deepening division between the two men and, although they came to a number of uneasy agreements over the next few years, their relationship finally broke down when Deslon published a letter in the *Journal de Paris* on 10 January 1784 explaining the problems he had experienced with Mesmer and announcing the opening of his own clinic (Pattie 1994: 131). In March 1784, in response to mounting pressure, partly from Deslon, who was keen to have animal magnetism properly investigated and legitimized as he had now been expelled from the Faculty of Medicine, and partly because of the increasing concerns about the more radical elements said to exist within the Society of Harmony, King Louis XVI instructed a Royal Commission to be set up to examine the therapy once and for all. The Commission included an array of notable French scientists, including Antoine Lavoisier (1743–1794), Joseph-Ignace Guillotin (1738–1814), and Le Roy, who had already been party to Mesmer's early attempts to introduce animal magnetism into the institutions; Franklin was appointed Chairman of the Commission. The Royal Commission, however, centred on Deslon's rather than Mesmer's practice. Mesmer refused to have anything to

¹³ This was originally called the Mesmeric Lodge of Harmony but was renamed to distinguish it from the Masonic lodges.

do with the Commission and again disappeared to Spa, but not before he had challenged the basis of the investigation.

Mesmer's reaction to the Royal Commission and to Deslon's involvement can be accessed in Mesmer's letter to Franklin dated 14 May 1784. It begins by addressing Franklin as 'Monsieur', a curt introduction that contrasts markedly with the courteous way that he addressed Franklin in his correspondence of November and December of 1779, referred to earlier in the chapter, where Mesmer opens his letters with 'Excellence'. This may demonstrate the more confident, even arrogant stance that Mesmer has developed during his years in Paris, or reflect his anger:

Vous êtes à la tête des Commissaires que le Gouvernement a envoyés chez M. D'Esilon pour obtenir la révélation de ma découverte, et en constater l'efficacité.

You are at the head of the committee sent by the government to M. d'Esilon's house, in order to obtain evidence of my discovery, and to judge its efficacy (Mesmer 2017: 247).

A translation of the first sentence of the letter is given on the Yale University website as, 'You are at the head of the committee [...] in order to witness the evidence of my discovery, and to judge its efficacy' (Mesmer 2017: 247).¹⁴ However, I would suggest that the sentence is more direct and that the phrase 'pour obtenir la révélation de ma découverte' could be interpreted as 'to *obtain* evidence of my discovery', as the Commission did not just witness the therapy but actively participated in obtaining evidence of how animal magnetism worked. The verb 'to obtain' also seems more in keeping with the tone of the letter, which is terse and proprietorial, as illustrated by the reference to 'ma découverte' (my discovery).

Mesmer's letter is long and goes on to denounce Deslon in the strongest terms:

I must therefore inform you, Monsieur, and through you I inform the entire committee chosen by the government, what kind of a man M. d'Esilon is, of what abuses of my trust he is guilty, and how feeble and imperfect is the knowledge that he stole from me (Mesmer 2017: 249).¹⁵

¹⁴ <http://franklinpapers.org/franklin/framedVolumes.jsp?vol=41&page=598> (accessed 1 May 2018).

¹⁵ The translation is given on the Yale University website: <http://franklinpapers.org/franklin/framedVolumes.jsp?vol=41&page=598> (accessed 1 May 2018).

Moreover, Mesmer enclosed a memoir that he intended to send for publication, as well as bringing a lawsuit against Deslon. The letter, particularly the concluding paragraph, foregrounds his aims both to tell his own story in an unadulterated manner and to defend his revolutionary method: ‘it is for all nations that I wish to tell my story and make my defense. Therefore, [...] my voice can be stifled here [the Report]; [but] this will only make my claim more imposing and terrible elsewhere’ (2017: 250).

Nicolas Bergasse, a lawyer and patient of Mesmer who also served as Mesmer’s secretary, claimed that he wrote this letter and many others on his behalf, much as Deslon had done in previous years (247). Bergasse also wrote the memoir against Deslon (‘Mémoire contre le Docteur d’Eslon’) but later wrote a pamphlet declaring that the information that Mesmer had provided about Deslon and his breach of contract was false (*Observation de M. Bergasse*, 1785, cited in Franklin 2017a: 249). However, this publication followed an acrimonious dispute between Bergasse and Mesmer.

Franklin’s reply, dated 23 May 1784, was unequivocally evasive:

I received, Monsieur, the letter which you did me the honor of writing on the 14th of this month, and the memoir which accompanied it concerning M. d’Eslon. I transmitted the letter as well as the memoir to the other committee members, as you wished, and they charged me with informing you, that in listening to M. d’Eslon, they are simply limiting themselves to the execution of their commission, in keeping with the wishes of the government (2017a: 251).¹⁶

As noted earlier, Franklin had already met with Mesmer in the autumn of 1779 at a dinner that Mesmer hosted for Franklin and Madame Brillon. That evening, Mesmer not only discussed animal magnetism with Franklin but also introduced him to patients whom he had successfully treated, as stated in the letter that Mesmer wrote to Franklin a few weeks later, on 1 December 1779:

Excellence,

The desire that you have shown me to learn about the benefits to be gained from the discovery of animal magnetism makes me hope that you will have the goodness to see for yourself the reality of the healing that I am doing.

¹⁶ The translation is given on the Yale University website: <http://franklinpapers.org/franklin/framedVolumes.jsp?vol=41&page=598> (accessed 1 May 2018).

Besides the patients whom you saw, I have several others whose state might shock you; I will have the honor to present them to you next Friday, the 3rd of this month, at noon, if your Excellence would take the trouble to come see them, and since you will be far from home, I would be doubly honored, if you will deign to accept an invitation to dinner.

I am, with the deepest respect, Your Excellence, your very humble and obedient servant. (Mesmer 1959b: 186).¹⁷

Whether or not Franklin accepted Mesmer's invitation to learn more about the therapy is unclear, but there is nothing to show that Franklin was convinced by the therapy. However, some correspondence between Franklin and La Sablière de La Condamine, a retired doctor in the south-east of France, in March 1784 reveals some valuable information about how Mesmer and his work were perceived. La Sablière de La Condamine is enquiring about the therapies of Mesmer and Comus, a showman who had set up an electric therapy practice in Paris, as he has read about them in the journals and newspapers:

I hear a lot of talk, sir, [...] of Comus, Mesmer, and so on. The first appears to have the approval of the faculty of medicine and operates openly, [...], while the second [Mesmer], although a doctor, appears to have the faculty and all the physicians of the capital against him (Franklin 2017b: 66).¹⁸

La Sablière de La Condamine's understanding of the reception of the two therapies is illuminating in its own right as it illustrates that even in provincial France, Mesmer is perceived as a *persona non grata* within the medical fraternity. A draft of a reply prepared by Franklin dated 19 March 1784 offers a view into Franklin's thoughts as the Commission began its enquiry. First, Franklin addresses the issue of Mesmer, stating that:

As to the animal magnetism, so much talk'd of, I am totally unacquainted with it, and must doubt its existence till I can see or feel some effect of it. None of the cures said to be perform'd by it, have fallen under my observation (Franklin 2017b: 66).

¹⁷ The translation is given on the Yale University website: <http://franklinpapers.org/franklin/framedVolumes.jsp> (accessed 1 May 2018).

¹⁸ My translation.

As in the letters involving Madame Brillion earlier in the chapter, there had been a meeting of the two men five years earlier. Duveen and Klickstein also comment on this in a footnote, 'Franklin fails to recall that Mesmer had shown him some cases in 1779' (1955: 288). This begs the question of whether Franklin forgot to mention his involvement with Mesmer or was just being cautious given his involvement with the Commission. In the same reply to La Sablière de La Condamine, Franklin goes on to say that he suspects animal magnetism will prove to be a 'delusion':

I cannot but fear that the expectation of great advantage from the new method of treating diseases will prove a delusion. That delusion may however in some cases be of use while it lasts. There are in every great rich city a number of persons who are never in health, because they are fond of medicines and always taking them, and hurt their constitutions (Franklin 1970: Vol. IX, 181).

Franklin is already alluding to the ideas of imagination or 'delusion', and also to the opportunism of Mesmer in terms of exploiting those with money. It was well known that Mesmer had made considerable sums of money from his wealthy clients and also that the cost of an initial subscription to the Society of Harmony ran to the sum of 100 louis and there were some 430 members (Darnton 1968: 73). The idea of the treatment room being a place of entertainment is reinforced in the 'Secret report', prepared by Bailly and the Commissioners for the king but not for general publication because it comments on the morality of the treatment: 'most of the women who present themselves to be magnetized are not really ill; many come out of idleness, or for amusement' (Bailly 2002: 364–5). Franklin is also alluding to the medical practices of the time and the excessive use of medicines that 'hurt their constitutions'. Despite advances such as the smallpox inoculations that Ingenhousz took to Vienna and the greater understanding of anatomy that emerged over the course of the eighteenth century, orthodox treatments had changed little and still involved bleeding, purging, and cauterization, which often caused more harm than good, as noted by Derek Forrester when he is talking of the treatments that Maria Theresa Paradis received in Vienna prior to being entrusted to Mesmer's care (1999: 13). Having warned of the perils of orthodox medicine, Franklin goes on to offer a positive view of a treatment such as animal magnetism:

If these people can be persuaded to forbear their drugs in expectation of being cured by only the physician's finger or an iron rod pointing at them, they may

possibly find good effects tho' they mistake the cause (Franklin 1970: Vol. IX, 181).

Here, Franklin is already alluding to the power of suggestion, invoking the symbols of healing by way of the physician's finger with its association to a mystical touch whether from a spiritual leader, monarch, or shaman, as well as the Staff of Asclepius, the ancient Greek symbol of medicine and emblem of the physician's profession. Mesmer too would claim that magnetic fluid would run through his fingers or through his iron rod, so Franklin is using imagery from Mesmer's own healing practice. Therefore, while Franklin sees little value in the treatment itself, it is the belief that holds value.

Franklin's reply to La Sablière de La Condamine also responds to the enquiry about the electric cures of Comus the showman and reveals his views on Comus to be more favourable, commenting: 'I think in general, Maladies caus'd by Obstructions may be treated by Electricity with Advantage' (Franklin 1970: Vol. IX, 181), although given Franklin's interest in electricity this is not too surprising. Comus was the popular name of Nicolas-Philippe Le Dru, a showman of scientific wonder who set up an electric therapy practice in Paris in 1782. Electric therapy was analogous to animal magnetism in that it was concerned with restoring a healthy flow of bodily fluids, claiming that nerves could become twisted and the vital fluid that they carried could thicken, so causing blockages. Electric therapy also used similar techniques to animal magnetism, a 'friction' generator bathed the patient, who sat on a wooden platform (their version of the baquet), then a type of grounding rod generated sparks all around the person being treated. There was a third step that involved discharging a Leyden jar, which is a device for storing electricity that was discovered in the mid-eighteenth century at the University of Leiden. At this time, the Leyden jar would have been a glass flask containing water that had a metal rod in it that was connected to an electrostatic generator or friction machine. The rod passed an electric current through the body, which was quite different from Mesmer's technique and, as remarked by Sutton, must have been painful (1981: 385–6). There was no directing of the fluids manually by the practitioner as in animal magnetism, and also none of the mystical elements implied by Mesmer, but there would have been a measureable substance to prove its existence.

Therefore, just as La Sablière de La Condamine had noted to Franklin, while Mesmer met with hostility from the Parisian institutions, the Commission set up by the Faculty of Medicine to investigate Le Dru in 1783 was 'sufficiently impressed to offer

Le Dru and his son membership in the faculty and the concomitant license to practice medicine in Paris' (Sutton 1981: 381), arranging for them to take over a charity hospital as a clinic and asking the government to confer on Le Dru senior the title of 'king's scientist'. Ultimately, however, Le Dru's therapy was rejected as apparently it did not result in the cures he promised and the new Commission judged that the very procedures that had convinced at least half a dozen doctors several months earlier were in fact ineffective and fraudulent (Sutton 1981: 389). However, Michael Lynn states that Le Dru's reputation was sabotaged by a rival, another long-standing practitioner of electric therapy, Pierre Jean Claude Mauduyt de la Varenne (2006: 64), a member of the Royal Society of Medicine who continued to write reports on the subject that were accepted and endorsed by the Royal Society, even after Mesmer and Le Dru had been discredited.¹⁹ This is in contrast to Mesmer, who wanted the many testimonies of his successful cures to bear witness to the efficacy of his treatments. Sutton believes that the members of the academies based their reasoning and judgement of Mesmer, Le Dru, and Mauduyt as much on the social status of the practitioner as on the empirical status of the therapy (Sutton 1981: 390–1). In this case, Mesmer was an outsider, both as a foreigner and as someone who was found to be unacceptable to the scientific community; doubts about his credibility had circulated and Mesmer reinforced these by making it clear that he had privilege to a technique that was above needing proof through experimentation, resorting to the endorsement of public approval when he could not receive that of the Establishment. Likewise, Le Dru targeted a more popular audience with his cures and so would have been considered less erudite than Mauduyt de la Varenne, who was one of the Society's own. Mesmer's fight for recognition by the Parisian institutes was therefore most probably doomed before it had started, but this was as much caused by his own attitudes as by any prejudice on the part of the authorities.

Despite Mesmer's protests, the Royal Commission set out to conduct a thorough investigation into animal magnetism and duly considered the best way to approach the matter. While they intended to observe the treatments and to devise their own experiments to test how the therapy might work, to them:

¹⁹ Jean-Paul Marat, a physician and anti-establishment figure who had incurred the displeasure of the Society, carried out a sustained and detailed attack on Mauduyt de la Varenne. Marat would come to prominence in the French Revolution but was famously assassinated in his bath.

The question of [animal magnetism's] existence is primary; the question of utility is not to be addressed until the first has been fully resolved. Animal magnetism may well exist without being useful but it cannot be useful if it does not exist (Franklin et al. 2002: 335).

When considering the parameters of their investigation into animal magnetism, the Royal Commission decided against trying to evaluate the success or otherwise of the therapy. As alluded to earlier in the chapter, determining whether a treatment offers a 'cure' is a complex and long-term undertaking. The Royal Commission pointed out in its report that illnesses may resolve themselves with time, noting that:

Treatment of diseases, therefore can only furnish results that are always uncertain & often misleading; this uncertainty could not be evaded, & all cause of illusion offset, except by an infinity of cures & perhaps the experience of a few centuries (Franklin et al. 2002: 338).

The report of the Commissioners quotes Mesmer himself, from his *Précis* of 1781, where he refuted the suggestion from an Academy of Science member to investigate the cure of diseases, saying it is 'a mistake to believe that this kind of proof is irrefutable; nothing conclusively proves that the Physician or Medicine heals the sick' (338). This statement would contradict Mesmer's usual stance on the efficacy of his therapy as he would often put the testimony of his patients forward as the necessary evidence to substantiate his claims, as for example in his 'Dissertation on the Discourse of animal magnetism', written in 1781, where he comments that his cases 'were known and verified by the physicians of the Paris Faculty [...] That should have been more than enough to prove beyond all doubt the advantages of my methods' (1980: 66–7). However, the conclusion reached by the Commission constitutes another example of the evasiveness and inconsistency that Mesmer displayed when his work was under official scrutiny, especially his unwillingness to help the investigation.

The Commission was unremittingly rigid in its approach and confined itself to 'purely physical proofs, that is, to the temporary effects of the fluid on the Animal body by stripping these effects of all illusions possibly mixed up with them' (Franklin et al. 2002: 338–9). Therefore, the Commission narrowed down the investigation to search for the existence of the fluid associated with animal magnetism and to eliminate 'suggestion' or 'imagination' from the experiments that they undertook, particularly as 'suggestion' had been linked to animal magnetism in the past. The investigation

consisted of various elements carefully constructed to test the existence of animal magnetism. First, the Commissioners attended Deslon's clinic, witnessing the effects of the treatments, including the crises experienced by his patients. They took measurements using an electrometer and a non-magnetized needle to see whether the baquet had any form of electric or magnetic charge, but found none (Franklin et al. 2002: 334). Second, the Commissioners themselves were then magnetized by Deslon, but failed to respond to the treatment. The Commissioners argued that in order to carry out their experiments in a more neutral environment they needed to test the treatment in a less public place and so Benjamin Franklin's house at Passy, just outside Paris, was used. It was in Franklin's garden where the famous tree experiment was carried out; here, Deslon was asked to select a patient who had proved sensitive to the treatment in the past and then to magnetize a tree out of sight of the patient. The patient was then brought out and experienced a strong reaction, falling down in a fit, but it was in front of the wrong tree. As well as experiments involving patients known to have responded well to animal magnetism, groups of people from diverse backgrounds were tested to see whether they responded to animal magnetism; of particular interest was whether the class or gender of the person affected their susceptibility. Finally, blinded trials were conducted, in which the patients were blindfolded so that they could not see the magnetizer during a series of controlled experiments. The conditions of the experiments were altered in order to test the responses of the individuals, and the results of these experiments were recorded in great detail. However, the conclusion was vague, deducing that 'there was not in all those experiments any variation other than that of the degree of imagination' (347). Shortly after the report, Franklin declared:

The Report [on Mesmerism] makes a great deal of talk. Everybody agrees that it is well written, but many wonder at the force of imagination described in it as occasioning convulsions, etc., and some feel that consequences may be drawn from it by infidels to weaken our faith in some of the miracles of the New Testament (Franklin 1906: 543).

As Franklin points out here, if the imagination can produce such extreme physical effects, then it could put into question events that were previously ascribed as the work of God. The idea of the imagination effecting improvements in health could also undermine the power of the medical institutions as it suggests that their pills and potions are no longer needed, although, as Franklin noted earlier, this would probably be a

benefit in many cases. In England, the report was considered so important that William Godwin was commissioned to provide a full translation. In his Introduction to the translation, Godwin calls animal magnetism an ‘imposture’ but also comments that the report ‘seems to throw new light [...] respecting the influence of the imagination upon the animal frame’ (1785: xvii). The findings of the Commission influenced many of Godwin’s future thoughts on power constructs not only of the mind but also of the power assumed by authority, ideas that were explored in his fiction, as discussed by Sharon Ruston (2013: 63–96). The report was sensational as it promoted what Emily Ogden calls ‘Mesmer’s demon’ (2012: 145), the idea of an unbiddable imagination that was capable of producing such profound effects as the mesmeric crisis or the means to heal. This view was echoed by Jean-Sylvain Bailly, one of the Commissioners, in his 1784 ‘Exposé of the Experiments that carried out to examine Animal Magnetism’, the text of a report presented to the Academy of Science to describe the work of the Commission: ‘Never had a more extraordinary question divided the opinions of an enlightened nation’ (2014: 78).

In retrospect, the investigations of the Royal Commission into animal magnetism proved an important step in terms of clinical research as they used early versions of randomized controlled trials, the methods that ‘have evolved into a standardized procedure, focusing on scientific assessment of efficacy and guarding the patient [sic] safety’ (Bhatt 2010: 10). While Dr James Lind’s ‘Treatise on Scurvy’, published in Edinburgh in 1753, was a famous landmark in the use of controlled clinical studies (Bhatt 2010), the Mesmer investigations provided some early ideas and applications of similar trials. A 2016 study by Matthew Jensen (et al.) discusses how the 1784 report by the Royal Commission described the evaluation of the use of animal magnetism ‘to treat neurological and other syndromes including headache and epilepsy’, in this case using blindfolds and screens to conceal the activities of the magnetists and so to control for suggestibility. While these trials are particularly well documented in the Commission’s reports, the proposal of similar trials was introduced into the animal magnetism debate prior to the 1784 Commission, including one suggested by Mesmer himself. Although blinding in therapeutic clinical research for neurological disorders was documented in the late eighteenth century, it did not appear to enter modern trials until the 1950s. Jensen et al. suggest that this increase in blinded trials has been due to the drive to disprove a therapy rather than to look for ways of proving it and, in addition, the

increasing recognition of the need to account for bias. In a similar way, the Commission used blinded trials to try to distinguish between the effect of animal magnetism and suggestibility.

The Royal Commission's report found that the 'power that sight has over the imagination explains the effects that the doctrine of magnetism attributes to it' (Franklin et al. 2002: 352) and 'signs & gestures employed are ordinarily useless, the Commissioners were told, unless the subject has already been taken hold of by being glanced upon' (352). The physiological importance of fixing the gaze in the patient was to become a subject of study in itself, for example James Braid in the mid-nineteenth century investigated the phenomenon as part of his work that would later become known as hypnosis (this is considered in more detail in Chapter 2). The gaze also would be an important trope to explore the power play between the magnetizer and magnetizee. As well as sight, touch, and sound, the report comments on its finding concerning the effects of imitation on the imagination, what we would now call crowd behaviour, on the patients subjected to group treatments, who are 'doubly excited therefore by its [imagination's] own movement & that of the surrounding imaginations' (Franklin et al. 2002: 357), noting that the 'same cause gives birth to revolt' and concluding that: 'Thus we meet again with magnetism, or rather with the theatrical play of the imagination, in the army, in large gatherings like that around the vat, acting by different means, but producing the same effects' (357–8). This concept was especially pertinent in view of the role of the mob in the French Revolution that was soon to come, and the role of suggestibility would also be important in future studies of human behaviour, particularly in the work of Gustave Le Bon (1841–1931) and Gabriel Tarde (1843–1904) in the late nineteenth century (Borch 2006: 83–102).

It was reported that 12,000 copies of the Commission's report were printed and circulated. As a result of the Commission's findings, Mesmer's followers expected animal magnetism to be outlawed as a therapy and Mesmer prepared to flee the country. However, Bergasse intervened and issued an appeal to the Paris Parlement for an unprejudiced investigation rather than the one carried out in the name of 'tyrannical medicine' (Darnton 1968: 85–6). In an extraordinary turn of events, the Parlement supported the petition and, although the investigation never took place, Parlement's defence of animal magnetism against the government and its institutions was a significant blow to the power constructs within the *ancien régime*. The Society of

Harmony began to dissolve when Mesmer quarrelled with Bergasse and Kornmann, who then formed the 'Kornmann Group', a more radical organization that used the ideals of Rousseau and the virtue of nature to highlight the moral and political standards of the times (Darnton 1968: 117–18). The political involvement was heightened when a scandal involving Bergasse's friend, Kornmann, and the aristocratic Beaumarchais became public, pushing the Society and animal magnetism into the dispute between the old regime and those who wanted a more equal society. Deslon himself was unhappy with the findings of the Commission's report and published a pamphlet in September 1784 refuting their findings and restating his admiration of Mesmer (Deslon 1784: 1–31). Deslon died in 1786; he never reconciled with Mesmer and in many ways his death marked the end of the first phase of animal magnetism.

Following the findings of the Royal Commissions, and despite the subsequent support of the Parlement, Mesmer became in many quarters a figure of ridicule in cartoons, and plays such as *Les docteurs modernes* (1784) by Pierre-Yves Barré and Jean-Baptiste Radet at the Comédie Italienne in Paris, and *Le magnetisme animal* (1786) by Louis-Nicolas Mareschal were hugely popular. At these performances, supporters of Mesmer would enter the auditorium to protest and hand out pamphlets in defence of animal magnetism, much to the annoyance of the audience. These encounters often resulted in violent outbreaks that were as dramatic as anything seen on the stage (Darnton 1968: 65–6). Animal magnetism continued to be a popular subject for entertainment and spread further afield. For example, Elizabeth Inchbald's *Animal Magnetism* (1788), an adaptation of *Le Médecin Malgré tout le monde* (1781) by Antoine-Jean Bourlin (known as Dumaniant), was performed in London's Covent Garden theatre district. While Inchbald's play is a farce, with the usual deceptions and false identities, Nathaniel Leach suggests that it also explores the darker aspects of animal magnetism, as in its 'reproduction of and not its divergence from, "legitimate" discourses of power' (2014: 715). In the play, the failed doctor embraces animal magnetism both to spite the medical authorities who want to revoke his licence to practise and to win the hand in marriage of his young ward. The young ward and her maid then pretend to submit to the wand of the magnetist, but in a deliberately exaggerated fashion, which seeks to subvert the authority both of the doctor and of the patriarchal figure. The performance within a performance harks back to a key aspect of Mesmer's treatments, particularly in his public salons, where Mesmer would create a

mysterious atmosphere, heightening the theatrical effect through the use of heavenly music, mirrors, and magician-like magnetic wands. In this environment, patients would create their own performance, either knowingly or otherwise, as they experienced the drama of the 'crisis'. This is noted in the Royal Commission's report: 'Impressions are communicated & reinforce each other, as one may notice at theatrical spectacles where the impressions are greater when there are many spectators [...] This indication of particular emotions establishes a general emotion which each shares to the extent to which he is susceptible' (Franklin et al. 2002: 357). Mesmer's extravagant costumes, particularly those adopted in his practices in Paris, which according to Jonathan Miller were embellished with 'mystical symbols' (2001: 729), did little to promote Mesmer's desire to be taken seriously as a man of science. However, the 'theatre' of animal magnetism did contribute to the authority of the magnetist and therefore would affect the susceptibility of those taking part in the treatments. The use of the gaze of the magnetist, already mentioned in conjunction with the findings of the Commissioners' report, is an element that grew in importance as 'animal magnetism' developed, a subject that will feature in later chapters.

Perhaps the most famous parody on animal magnetism appears in Mozart's 1790 opera *Così fan tutte*. The abrupt end of the friendship between Mesmer and the Mozart family was discussed earlier in this chapter, and although Mozart would have been aware of the implications of the comical portrait of Mesmer, he was not involved in the opera's inception. A study by Pierpaolo Polzonetti (2002) considers the effect on the opera of a scandal that broke out between Kornmann, who together with Bergasse was instrumental in setting up Mesmer's Society of Harmony, and the playwright Pierre-Augustin Caron de Beaumarchais (1732–1799). The libretto of the opera was originally written by Lorenzo Da Ponte (1749–1838) for Antonio Salieri (1750–1825); Salieri had been staying with Beaumarchais during the time of the scandal and witnessed the intrigues surrounding Kornmann's claims of his wife's infidelity with a high-ranking nobleman. When Salieri withdrew from the project, Da Ponte brought it to Mozart, who undertook the composition. In the opera, the maid, Despina, enters dressed as the doctor who pretends to revive the two lovers, themselves disguised, of Fjordiligi and Dorabella, as part of a ruse to test the fidelity of the two women. It is a short scene but pivotal to the plot and one that further layers the motif of disguise and pretence. The libretto makes it clear that the doctor is Mesmer:

DESPINA: Don't be worried, don't be upset; / here is a proof of my power (*with part of the magnet she touches the heads of Ferrando and Guglielmo, then draws it gently along their bodies*) /

DORABELLA, FJORDILIGI, DON ALFONSO: He has taken an iron implement in hand.

DESP: This is that piece of magnet, Mesmer's stone that originated in Germany, then was so famous there in France.

DORABELLA, FJORDILIGI, DON ALFONSO: How they move, writhe, stir! Soon they will strike their skulls on the ground.

(Polzonetti 2002: 279)

So here we see a direct reference to Mesmer and his treatment, including the crisis as the men 'writhe' and the women are instructed to help. Polzonetti comments on how the scene is reflected in the score:

Mozart stresses the effect of holding the heads tight by repeating the word 'forte' three times [in the score]; meanwhile the string tremolos and repeated crescendo–decrescendo dynamics convey a sense of the intensification and then smothering of the convulsions (Polzonetti 2002: 281).

This indicates that Mozart was able to reflect the drama of Mesmer's salon in his music and also had a familiarity with the process. While Andrew Steptoe's view is that Mozart's participation in ridiculing Mesmer stemmed from both his personal disapproval of Mesmer and his appreciation of how the topicality would entertain his audience (1986: 254), Polzonetti considers the possibility that the main thrust of the opera was more concerned with the ideology of the Kornmann group and its moral stance than with ridiculing Mesmer (Polzonetti 2002: 293–6). The popularity of the opera in our own time suggests that the themes addressed here are still important, in terms of the power constructs not only between the sexes but across the classes, particularly through the manipulative figure of the aristocratic Don Alfonso. The theatrical representation of Mesmer is fitting in that while it represents the dualism in terms of the 'imposture' of animal magnetism, it also celebrates in a strange dichotomy the truth that can emerge from the imaginative abilities of those who believed in and benefited from the therapies.

Mesmer and his legacy

As we have seen, Mesmer courted controversy, embarking on acrimonious disputes and vitriolic quarrels, dismissing even his most devoted disciples, such as Deslon. With the more collegiate approach that existed, at least outwardly, across the increasingly pan-European centres of learning, Mesmer's attitude was out of time. He was not someone who was prepared to work collectively for the greater good of science, despite his protestations that his only motivation for pursuing his treatments was to benefit humanity. Mesmer sought sole recognition and admiration for theories that were often appropriated from other sources, for, as Pattie notes of Mesmer's medical thesis, 'the taking of a set of case histories and quotations *en bloc* from Mead is entirely in harmony with the lack of scholarship which is glaringly apparent in Mesmer's other writings' (1956: 284). When individuals or institutions stood in his way, as in the case of Father Hell, the French authorities, or even the Queen of France, Mesmer would react by circulating vicious publications rather than reasoned debate. He frequently misread responses to the demonstrations of his therapies, for example Ingenhousz in Vienna and Le Roy in Paris, incurring the enmity of the very people whom he wanted to impress. Ellenberger described Mesmer as 'a fundamentally egocentric and suspicious man, moody, despotic, greedy, and at times even dishonest' (1970: 65), and while this portrait would endorse the one painted by the scientific and medical establishments, it should be noted that Mesmer had a devoted following both as a physician and as a teacher. Therefore, it is difficult to resolve the two aspects of his personality.

Derek Forrest stated that 'there can be little doubt that at the height of his mood swings he [Mesmer] had the charisma of a great religious or political leader, and he had a psychological makeup in common with many such' (2002: 305). Goldsmith comments on the almost mythical stories that were told about Mesmer's early abilities, for example how as a boy 'he exerted a magnetic influence on the sick' and how his presence could affect the flow of blood when someone was being bled (1934: 41), although these may have been apocryphal accounts that Mesmer himself gave to a biographer later in life.²⁰ Mesmer's unwavering belief in himself and his compulsion to protect the ownership of his therapy go some way to explaining his success with patients. If his own confidence was supreme, his personal presence so intense, and his

²⁰ For example, the German physician Christian Wolfart visited Mesmer in his retirement, publishing a work on Mesmer and animal magnetism in 1815.

famous gaze so piercing, it is reasonable to assume that this faith would be imparted to his patients and followers, just as in the infectious effect of the crises in a crowded salon noted by the Royal Commission. This raises the question of the relationship between an individual practitioner and the patient, and whether a study of Mesmer's treatments would have produced a different outcome to Deslon's.

Mesmer's personality and its effect on the reception of animal magnetism beg some debate about how certain unorthodox ideas were acceptable to the Paris institutions, while others such as Mesmer's were dismissed at an early stage. Mesmer's arrogant attitude, dogmatism, and seemingly grasping desire for money negated any serious evaluation of the results of his methods. Mesmer's view of himself can be seen in this letter sent to Franklin dated 14 May 1784: 'Like you, Monsieur, I am among those men who, because they have accomplished great things, are empowered to shame others, just as powerful men have authority at their disposal no matter what one dares attempt' (Mesmer 2017: 247–50).²¹ Mesmer may be considered a charlatan, with his unsubstantiated claims for his treatments, but nonetheless he saved many from the harmful effects of the orthodox prescriptions of the time. It should also be noted that Mesmer's treatments benefited many and paved the way for studies into the workings of the mind. This supports Steven Jay Lynn and Scott Lilienfeld's description of animal magnetism as 'protoscientific rather than pseudoscientific' (2002: 380), as it was a phenomenon that was ahead of its time but nonetheless prompted debate and investigation, as well as raising political issues in terms of the entitlement of power. This is where Mesmer's contribution is most evident; if Mesmer had not been so tenacious and, one might argue, intractable in his pursuit of obtaining definitive approval of this therapy, the methods adopted on both sides to disprove or prove the treatment may not have been so inventive, which would have been a loss to the development of scientific research. The Royal Commission, through its critical and thorough investigation into animal magnetism, highlighted the effects, or perceived effects, of the mind on the physical state of the body. Mesmer was continually unwilling, or perhaps unable, to carry out, or cooperate with, a serious and detailed study of animal magnetism. However, Douglas and Joseph Lanska view the abandonment of animal magnetism under the impetus of the negative findings of the Commission as an example

²¹ The translation is given on the Yale University website: <http://franklinpapers.org/franklin/framedVolumes.jsp?vol=41&page=598> (accessed 1 May 2018).

of the so-called ‘tomato effect’,²² where something is rejected because of a lack of prevailing knowledge at the time, to the extent that the therapy incorporated a therapeutically efficacious component, even if the theoretical basis was faulty (2007: 315).

The subject of the imagination, raised so often by the investigators of animal magnetism, and the effects of suggestion would become a topic of much debate across Europe during the early years of the nineteenth century. Mesmerism did not go away but evolved, particularly through the work of the Marquis de Puységur, who treated patients by putting them into a trance or state of ‘artificial somnambulism’, that is as opposed to natural somnambulism (i.e. sleep), rather than inducing a seizure-like crisis in the manner of Mesmer. As Benjamin Franklin wrote in a letter to Jan Ingenhousz dated 29 April 1785:

Mesmer continues here and has still some Adherents, and some Practice. It is surprising how much Credulity still subsists in the World. I suppose all the Physicians in France put together, have not made so much Money during the Time he has been here, as he alone has done.

Franklin’s words reinforce the idea that Mesmer was a charlatan who was in pursuit of money, but as he rightly comments, Mesmer’s therapies continued:

And we have now a fresh Folly. A Magnetiser pretends that he can by establishing what is called a *Rapport* between any Person and a Somnambule, put it in the Power of that Person to direct the Actions of the Somnambule, by a simple strong Volition only, without speaking or making any Signs; and many People daily flock to see this strange Operation! (Franklin 1785: unpublished).

Medically, the state of somnambulism was found to be a powerful anaesthetic and was the basis of further scientific investigation. However, somnambulism also served as an inspiration to artists and writers, who used this phenomenon to examine the interplays of human behaviour. This is discussed in more detail in the Conan Doyle chapter of this thesis.

As to the Parisian institutions, during the turbulent period of the French Revolution, the demand was for democracy in science, not ‘aristocratic’ science, something that

²² The ‘tomato effect’ refers to the presumption on the introduction of the fruit from South America that it was poisonous because it belonged to the nightshade family (Lanska and Lanska 2007: 315).

Michael Gordin et al. term ‘ideologically correct science’ (2002: 35, 37). The Royal academies were closed at the start of the revolution because of their association with the old regime, but they reopened in 1795 as part of the Institut National des Sciences et des Arts.²³ Mesmer himself was caught between two camps: he was viewed suspiciously by the new guard because of the links to his aristocratic patients, resulting in his money and land being confiscated, but on returning to Vienna he was arrested because of his associations with the radical elements of the Society of Harmony. After his release, Mesmer returned to Paris, managed to obtain a pension and spent a quiet retirement in the town of Frauenfeld, close to Lake Constance and near his birthplace. But this was not the end of Mesmer’s story, as Franklin has predicted in a letter in 1784:

Some think it [the Report on Mesmerism] will put an end to Mesmerism, but there is a wonderful deal of credulity in the world and deceptions as absurd have supported themselves for ages (Franklin 1906: III, 543).

Three years before Mesmer’s death in 1815, the Berlin Academy decided to re-evaluate the phenomenon, despite the fact that the institution had rejected Mesmer’s claims for animal magnetism to be recognized in 1775. On discovering that Mesmer was still alive, the Academy issued an invitation to Mesmer as they wished to honour him. Mesmer refused on the grounds of his age; however, he did permit a visit from the German physician Karl Christian Wolfart (1778–1832). Mesmer was so impressed with Wolfart that he asked him to edit the book that he had been writing for some time on his reflections on animal magnetism. While Ali Landauer admits that ‘it was the spirit of the time, the *Zeitgeist* of romanticism rather than scientific method, which motivated Wolfart’s interest in animal magnetism’ (1981: 207), Wolfart took up animal magnetism and became Professor of Magnetism in Berlin. Therefore, it was Wolfart’s work, together with the new ideas of de Puységur, that started a new phase of animal magnetism, or as it was increasingly called, mesmerism.

²³ The name of the Academy of Science was restored by the Bourbon monarchy in 1816 and, although autonomous, still remains part of the Institut de France.

Chapter 2

Magnets and Mesmerism: Ada Lovelace at the Cusp of Reason and Romance

While Augusta Ada Lovelace¹ is considered a pioneer in the field of computer science, her interest in and investigations into mesmerism are less well known. By integrating a technical perspective with archival research and a historicizing approach, I consider in this chapter the detailed and inspirational work that AAL undertook on Charles Babbage's Analytical Engine and the many facets of her investigation into mesmerism, a practice that seemed to defy the laws of reason, yet was accepted by many at the time as a valid healing therapy. The chapter examines documentary evidence drawn from the letters and notes written by AAL and her circle that reveal the extent of AAL's involvement in the subject of mesmerism. I also draw on contemporaneous reports in the medical press as well as local newspapers to chronicle and contextualize the debates and controversies on mesmerism that were taking place in England at the time. From the examination of AAL's work on the Analytical Engine and the draft of a review of Baron von Reichenbach's work on magnetism prepared by AAL, most probably written in 1846 but never published, I suggest that AAL promoted a unique approach to science, one that offered method and rigour but was also radical and imaginative. Further to this, AAL's refusal to comply with the conventional roles and behaviours expected of a woman of her class point to her as a prototype for the 'New Woman' that was to emerge later in the nineteenth century. Therefore, in this chapter, I will position AAL not only as a key figure within the social and scientific sphere of early Victorian Britain but also as an important innovator in terms of contemporary thinking.

AAL was the daughter of the Anglo-Scottish poet Lord Byron and the English scholarly reformer Anne Isabella Byron (*née* Milbanke and affectionately known as 'Arabella'). By virtue of her mother's strict ideas on her daughter's schooling and later her marriage to William King, the Earl of Lovelace, AAL was an educated woman of wealth and influence. From this privileged position, AAL was uniquely placed to question those who were at the forefront of the scientific and medical community. This was a task that she undertook with relish, having both the determination to get to the

¹ Hereafter referred to as AAL, a signature that she often used herself.

heart of a problem and the confidence to continue unabashed until she understood the answer. Her mathematical training and imaginative eye offered fresh insight into the possibilities of Charles Babbage's revolutionary machines, leading to her being celebrated in our own time for her contribution to what would become computer science. AAL's interest in the latest scientific theories and advances was well known, which meant that it was her name that was raised as the likely anonymous author of the sensational *Vestiges of the Natural History of Creation*, which was published in 1844.²

AAL has been the subject of a number of biographies and has featured in many texts that consider contemporaneous figures and cultural phenomena. Critical opinions on her abilities and contribution, particularly in relation to Babbage's work, are often divided. Bruce Collier, for example, was particularly dismissive of AAL in his 1990 book-length study of Babbage. Dorothy Stein was also critical of AAL's mathematical abilities in her incisive 1985 biography, taking into account not only letters by AAL but also those sent to her, so providing a multifaceted view of the discussions. At the other end of the spectrum, Doris Langley Moore's 1977 and Joan Baum's 1986 biographies were much more favourable. Betty Toole's comprehensive and extensive research into the Byron–Lovelace correspondence was published in 1992. Toole's book contains transcriptions of almost 400 of AAL's letters that chart her life from childhood until her last days, and includes helpful summaries to interpret the letters in terms of the dates and events surrounding them. These works establish AAL's place not only in nineteenth-century society but also in the history of technology, a position that is endorsed by Doron Swade (1991a, b), an acknowledged scholarly authority on Babbage and his work. More recently, Benjamin Woolley's 1999 biography takes a measured view of these different perspectives, while James Essinger nailed his colours firmly to the mast in *A Female Genius* (2014).

² AAL was often assumed to be the author of the anonymous publication of *Vestiges of the Natural History of Creation* (1844), although the author was later identified as the publisher himself, Robert Chambers. *Vestiges* aimed to explain the current thinking on science and creation and while much of the science was dismissed as amateurish, nonetheless there were those in the scientific Establishment who supported its attempts to explain the many theories of the time. Indeed, Charles Darwin said, '[*Vestiges*] has done excellent service in [...] preparing the ground for the reception of analogous views' (Krueger and Stade 2003: 76). James Secord also notes that another who was considered as a potential author of *Vestiges*, Sir Richard Rawlinson Vyvyan, a staunch Tory aristocrat, was most displeased, 'not because evolutionary doctrines ruled out all but infidels as painless authors, but rather because of the wide readership the work appeared to target' (2003: 182). This echoes the exclusivity of events such as Babbage's soirées, which separated the elite from the general public. This division was to be challenged by mass education and the demand for knowledge through lecture circuits and public readings, such as those performed by Dickens.

The vast bank of correspondence and literature that has been left by AAL, her family, friends, and acquaintances means that it is possible to build up a picture of her world and to examine events through the different perspectives that emerge. The extensive and efficient postal service network of the time meant that correspondence could be despatched, delivered, and even replied to within the same day, or possibly in a few hours for those in London. These letters and notes provide an often intimate insight into the minute details of AAL's daily life, in a similar way to today's texts and emails. AAL's mother, Lady Byron, was particularly aware of the legacy of correspondence, using it to great effect in her acrimonious disputes with her 'mad, bad and dangerous to know'³ husband and his fervent supporters. For example, in the early stages of her separation from Lord Byron, Lady Byron would write letters to her mother that documented her maternal care and included the instructions 'to be kept' (Stein 1985: 17), so ensuring that she, rather than Lord Byron, kept custody of her daughter, Ada, which was an unusual occurrence at that time. AAL was less cautious and there are gaps in the Lovelace letters that correspond to particular events or relationships that were felt to be too scandalous to remain on record; for example, AAL's alleged indiscreet letters to John Crosse, a man rumoured to be her lover as well as her accomplice in a gambling ring, were purchased by Lady Byron and destroyed. Florence Nightingale records that when she visited the Lovelaces' London family home just days after AAL's death, she was told by the housekeeper that Lady Byron 'has burnt everything, all the dreadful letters which would have broken their hearts to know of' (2003: 760–1). However, in the Lovelace–Byron Collection at the Bodleian Library in Oxford alone there are still something in the order of a thousand of AAL's letters, and these honest, often impulsive and playful, writings reveal much of AAL and the work that she undertook.

Ada Lovelace: her background, circle, and beliefs

The daughter of the scandalous Lord Byron was from the start, as her friend Woronzow Greig put it, 'cradled in celebrity' (Stein 1985: 172): crowds would gather just to catch a glimpse of AAL and her mother on their way to church. The press watched for signs of her being her father's daughter, as did Lady Byron, who was terrified by the possibility that her child might display the undesirable traits or poetic temperament that

³ This famous description was recorded by Lady Caroline Lamb in her diary on first meeting Lord Byron in March 1812 (Shapiro, Fred R. 2006. *The Yale Book of Quotations*. New Haven, CT: Yale University Press, p. 440).

were so evident in her husband. This may account for the fact that, unusually for a girl at the time, young Ada was schooled in science and mathematics as well as the more ‘acceptable’ skills of music and French. Lady Byron herself came from a family that encouraged her aptitude for learning and she studied under the controversial and radical social reformer William Frend. Frend would later tutor AAL in mathematics and encourage her acquaintance with Mary Somerville, a mathematician who was becoming established in the world of science.

Lady Byron was well known in her own right, as a leading reformist and prominent slavery abolitionist. The regime that she imposed upon her daughter was strict, although AAL was able to escape into her imaginative world. For example, in a letter to her mother dated February 1828, she explains her ideas for exploring the art of flying, by making paper wings and creating a book on ‘flyology’ that would document her methods, an episode that Betty Toole describes as the beginning of AAL’s ‘very unique path to understanding science and technology, a combination of imagination and experimentation’ (1992: 29). AAL’s escapes were not only in her imagination and, much to Lady Byron’s horror, the seventeen-year-old AAL developed an infatuation for a young tutor assigned to teach her shorthand. AAL was meeting him in secret but her plans to elope were thwarted when the affair was discovered by the ‘three furies’, the close companions of Lady Byron, who tormented the young AAL through, as AAL perceived it, their constant observation and tale-telling. Sophia De Morgan (William Frend’s daughter and later the wife of Augustus De Morgan⁴), one of the ‘three furies’ and often quite duplicitous in her dealings with AAL, wrote some years later⁵ of the affair and AAL’s ‘heedlessness & imprudence’, informing Lady Byron at the time that ‘[i]t was very evident that the daughter who had inherited many of her father’s peculiarities also inherited his tendencies’ (Woolley 1999: 121). AAL later confessed the whole episode in great detail to her confidant and lawyer, Woronzow Greig (Mary Somerville’s son), who included it in his memoirs (Stein 1985: 34–5). AAL’s letters to Greig were very intimate and alluded to a number of episodes that had resulted in gossip about her unchaperoned meetings with men, writing to him in July 1850 that, ‘[m]y character cannot be mended now. It was utterly gone before I was 26’ (Toole 1992:

⁴ Augustus De Morgan was a famous logician and one of Ada’s mathematics tutors.

⁵ Sophia De Morgan’s reminiscences were written in 1895, many years after the events took place, but nevertheless offer an interesting insight into Lady Byron and her character. It also reveals much of the correspondence detailing Lady Byron’s education projects.

361).⁶ This indicates AAL's passionate and impulsive nature as well as a lack of care for social convention, suggesting that the destroyed letters may well have contained scandalous material and that AAL was openly flouting the conventions of the time.

After the failed elopement, and in an effort to make amends for her misconduct, a shamed AAL resumed her studies with Dr William King, a reformist and staunch Methodist friend of her mother's. He advised 'Mathematics and Natural Science [...] they have no connexion with the *feeling* of life: They cannot by any possibility lead to objectionable thoughts' (Stein 1985: 43). This was an unusual therapy for diverting AAL's attentions away from the temptations of the flesh as at the time too much bookishness was considered injurious to the delicate female constitution. Later in life, AAL was advised to refrain from too much mathematics because of its harmful effects on her health.

In the spring of 1833, AAL was presented at Court and entered the marriage market, where she found in William, Lord King (later to become Earl of Lovelace) a suitable and advantageous match. They married on 8 July 1838 in a quiet wedding, although they could not completely escape the interest of the press. Lady Byron did, however, feel the need to communicate the extent of her daughter's earlier escapade to her prospective son-in-law but wrote with much relief to Sophia Frend (later Sophia De Morgan), 'He knows *all*, and is most anxious for the marriage' (Stein 1985: 53), suggesting not only Lady Byron's scrupulous moral values but also the burden of guilt that must have weighed heavily on AAL.

The 'mesmeric' figure of Byron still fascinated the world at large and his presence in AAL's life cannot be ignored. At the height of the threat from Napoleon, Elizabeth, Duchess of Devonshire noted in a letter to her son shortly after the publication of Byron's *Childe Harold's Pilgrimage* in 1812, 'The subject of conversation, of curiosity, of enthusiasm almost, one might say, of the moment, is not Spain or Portugal, Warriors or Patriots, but Lord Byron!' (Foster 1898: 375–6). Benjamin Disraeli's popular novel *Venetia*, published in 1837, centred around AAL's relationship with her father, in the guise of Venetia Herbert. However, Lady Byron herself did not comment on or even acknowledge the many publications that speculated on the poet and his family, the exceptions to this rule being Thomas Moore's *Life of Byron*, first published in 1830, which she intended to refute in a published pamphlet but was eventually persuaded

⁶ The underlinings are as per AAL's original.

against so doing, and Byron's own memoirs, which her representatives ensured were destroyed shortly after his death in 1824. AAL was dogged by the scandal of her parents' dramatic separation, and many of Byron's devoted followers blamed Lady Byron for his early death. Harriet Beecher Stowe later wrote a biography, *Lady Byron Vindicated* (1870), designed to restore Lady Byron's reputation after the scandal of her separation from the famous poet, although this was not entirely successful as, to many people, Byron still could do no wrong.

AAL strove to establish herself as a serious student of science and mathematics. However, the position of women in science was a frustration for AAL, as witnessed when she was thwarted in an attempt to gain access to the library at the Royal Society. She wrote to Woronzow Greig on 5 December 1844:

When [Lord] Lovelace became a member of the Royal Society several years ago, it was entirely on my account. But the inconvenience of my not being able to go there to look at particular Papers &c which I want, continually renders the advantages I might derive quite nugatory (Toole 1992: 305).

Not dissuaded, AAL went on to ask if she could be smuggled in during the early morning when no one was about; it is unclear whether she actually did this, but perhaps this letter illustrates her rebellious streak.

Though sensitive to how she appeared to others, AAL was not one to pay court to convention. She was often considered an outsider and some questioned her mental health, as recorded by her father's old friend, John Cam Hobhouse, in May 1847, when 'Lady Charlotte Berkeley, in a whisper, asked me if she [AAL] was not mad' (Hobhouse 1909: 191). AAL had already shocked Hobhouse at a dinner party in June 1846, by discussing the taboo subject of life after death. He wrote in his diary:

[s]he spoke to me very freely on subjects which few men, and scarcely any women, venture to touch upon [...] She said that she would not say so much to any one except very privately, nor would she run the risk of depriving any human being of the consolations of belief. Her own impressions were only doubts and she thought it as presumptuous to be certain one way as another (Hobhouse 1909: 175–6).

AAL was equally candid in her enquiries to Michael Faraday about his religion. He disclosed to her that he was of a 'very small and despised sect of Christians, known, if

known at all, as Sandemanians' (Stein 1985: 140).⁷ Faraday seemed overawed by AAL, requesting via Babbage in 1840 a portrait of her for his collection, but they became friends (Stein 1985: 131–2). Faraday was one of a number of leading scientists who were part of her circle, but her acquaintances also included writers, artists, and musicians, as well as social reformers of the day.

The extreme highs and lows in AAL's spirits, her compulsive, almost obsessive, drive (a behaviour that later also manifested itself in her gambling⁸), her desire for rigour in her work, as well as imagination in her research, all suggest a struggle between the romantic and rational souls that dwelt within her. Indeed, AAL sees this struggle in terms of magnets, writing to Faraday in November 1844, 'I have in me both north and south polarities [...] & for once united in a beautiful harmony faculties that usually do not co-exist' (Lovelace 1844). AAL also often described herself in terms of the supernatural, in particular her 'fairyism'. Stein (1985: 109) notes how Babbage, in a letter in July 1843, attempted 'to bring her [AAL] back to reality and moderate some of her more manic transports'. In reply, AAL defends her use of the imagination:

Just because she happens to have some of that very imagination which you would deny her to possess; & therefore she enjoys a little play & scope for it now and then. Besides, this, I deny the Fairyism to be entirely imaginary; (& it is to the fairy similies that I suppose you allude). [...]

Your Fairy for Ever,

A.A.L. (Toole 1992: 203).

Babbage must have accepted the fairyism as, by 9 September 1843, he wrote to AAL as 'the Enchantress of Numbers', and finished the letter 'Farewell my dear and much admired Interpreter' (Toole 1992: 266–9).

Benjamin Woolley suggests that fairyism was a way that AAL 'expressed her own ambivalence towards science, the feeling there was a part of her that was too romantic for Babbage's solid permanent, consistent scientific world' (1999: 264). According to

⁷ The Sandemanians believed in the literal interpretation of the Bible. Faraday writes 'in my intercourse with my fellow creatures, that which is religious and that which is philosophical have ever been two distinct things', prefiguring perhaps the divisions in science and arts that were to come.

⁸ Florence Nightingale received a letter from the artist and medical reformer Selina Bracebridge, dated 7 August 1850, passing on the news that AAL had lost £20,000 in gambling at Epsom. Bracebridge commented, 'it is a grievous matter for her poor husband when she plagues him enough in other ways without gambling—how sadly she has inherited her father's disposition and [illegible] mind' (2003: 759).

Charles Dickens, fairies bridged the arts and sciences. In 'Fairyland in 'Fifty-Four' (1853), Dickens' narrator asks,

What have I done that all the gold and jewels and flowers of Fairyland should have been ground in a base mechanical mill and kneaded by you—ruthless unimaginative philosophers—into Household Bread of Useful Knowledge administered to me in tough slices at lectures and forced down my throat by convincing experiments? (1853: 313).

Melanie Keene suggests that 'such responses were a common part of the debate over who should have access to scientific knowledge in the second quarter of the nineteenth century' (2015: 41). Whether AAL's fairyism was a way to establish her poetic side as well as her scientific credentials we cannot be sure; however, there were those who thought her aristocratically eccentric at best and a witch at worst. Joan Baum describes how the anatomist Henry Acland, who lived near the Lovelaces' Somerset estate, went riding with AAL one afternoon after luncheon in September 1839. He wrote to his mother immediately afterwards to say that he found AAL blunt and 'so very curious' that he amused himself in thinking she might be a 'papist' or a 'witch', and told her so (Baum 1986: xiii and 110, note 6). This idea was reinforced by her 'Devil or angel' remark to Greig, 'I have a spell of some *sort* about me' (Stein 1985: 174).

Ada Lovelace, Charles Babbage, and the Analytical Engine

Shortly after she had been presented at Court, AAL met Charles Babbage and by March 1834 she was writing to Mary Somerville about her invitation to Babbage's 'Saturday parties' (Toole 1992: 137). Babbage's weekly soirées held at his home were an important feature of London society. They were frequented by famous figures from across the disciplines, such as the Duke of Wellington, scientists such as Michael Faraday and Charles Darwin, and writers such as Charles Dickens and Harriet Martineau. At these parties, Babbage would show the 'Silver Lady' mechanical figure that he had acquired, as well as a model of his invention, the Difference Engine. Babbage's Difference Engine was designed to compute the complex arithmetic tables used for applications such as navigation in order to reduce the errors from manual calculation. Babbage had published logarithmic tables in 1827, which were reprinted and in use into the twentieth century, and so had some experience with the problem. It was the Difference Engine rather than the 'Silver Lady' that intrigued AAL; so began

her interest in Babbage's machines and her friendship with their inventor. Lady Byron wrote to Sophia De Morgan on 28 June 1834, reporting that, 'Ada was greatly delighted with the first of Dr Lardner's lecture on Babbage's machine at the Mechanics' Institute' (De Morgan 1895: 203). By July of the same year, AAL is writing of her 'great anxiety about the machine [Babbage's Engine]' (Stein 1985: 59).

By the time AAL was introduced to Babbage, he was already a controversial figure. He had secured considerable funds from the government to develop the Difference Engine but had not actually delivered a fully functional machine. This damaged his reputation and meant that when he then wanted to move on to his new device, the Analytical Engine, this was met with a less than enthusiastic response. He was also an outspoken critic of the scientific institutions and publicly declared them to be behind the times. However, the friendship between AAL and Babbage flourished. In November 1834, AAL writes, again to Mary Somerville, about how grateful she is to Babbage and his son for sending 'the plates & account of the Machine' and says that she is busy 'copying out the Steam Engine paper that [she] carried off from Mr Babbage's the other day' (Toole 1992: 61). Both before and during her marriage, AAL had spent time touring the steam-driven factories of the industrial North of England. She particularly noted the way that the Jacquard loom used an early form of punched card, a technique that inspired both AAL and Babbage in terms of the design and application of the Analytical Engine, a more sophisticated and general-purpose machine that supplanted the original Difference Engine.

AAL and Babbage shared many interests. Communication systems were important to them both. Laura Otis comments on their mutual curiosity about parrots, as they were fascinated by these random generators of language [...] What automata are to motion, parrots are to language: they produce patterns that have been impressed upon them, but they do not design their own patterns or "think" about the best – or worst – time to reproduce the patterns (Otis 2011: 40).

This separation of the mechanical operations and higher reason of the brain can be reflected in the concept of a machine carrying out the tasks as given to it but not creating the ideas in the first place.

B.V. Bowden talks of Babbage's outspoken criticism of the Royal Society but also cites his long list of inventions and ideas, even quoting how Babbage once tried to establish statistically the credibility of biblical miracles, estimating that the chances of a

man rising from the dead were 1 in 10^{12} (one trillion) (Bowden 1971: xii). Babbage was a strong Europeanist and had radical connections abroad, whom Hyman calls his ‘old Bonaparte friends’ (1982: 186), and Charles Lucien, eldest son of his friend Lucien Bonaparte, was a leader of the radical scientific movement in Italy. In Italy, however, ‘every subject mentioned seemed to have revolutionary implications ... And Charles Babbage for a time was a formidable radical force [helping to build railways to unite Italy, with his son Herschel and his brother Douglas]’ (Hyman 1982: 186–7). Ever enquiring, Babbage also contemplated the possibilities of geothermal energy when he considered Italy’s hot springs. Hyman notes that in England, ‘there was little radicalism left among men of science, who were becoming increasingly absorbed into the bureaucracy’ (1982: 186), which perhaps was at odds with someone like Babbage, who seemed more at home in scientific debate than in management and administration. This was noted by AAL later in their association when she suggested, in August 1843, that she and Lord Lovelace ‘conduct the business’ for Babbage while he devoted his ‘undivided energies [...] to the execution of the work’ (Toole 1992: 230). While there was a firm refusal of this proposition from Babbage, it did not seem to affect their friendship. Babbage was perhaps a father figure for Ada, and likewise she may have been a daughter figure for him, as she was about the same age as the daughter he had lost in 1834.

Babbage continued to produce drawings and diagrams of his Analytical Engine, eventually taking them to Turin in 1840, where he explained his plans and ideas to an interested audience. In response to this, the young Italian mathematician Luigi Menabrea published a paper in the French *Bibliothèque Universelle de Genève*, in October 1842, which provided a ‘Sketch of the Analytic Engine’.

By this time, married and having discharged her duty to produce an heir, AAL wanted to continue her studies and research work. Despite her social and family duties, AAL’s diverse interests meant that she mixed not only in courtly circles but also among those engaged in the sciences and the arts. She also continued her acquaintance with Babbage and her links with the scientific community, attending the public lectures at the Royal Society and the Mechanics Institute as well as Babbage’s soirées. Charles Wheatstone, a staunch figure of English science, was, according to Stein, a family friend of the Lovelaces and ‘took a great deal of sympathetic interest in Ada’s plans, constituting himself as a sort of career advisor’ (1985: 88). He had seen Menabrea’s

paper and wanted to publish a translation of it in *Taylor's Scientific Memoirs*, a new periodical that focused on the dissemination of interesting European papers. Benjamin Woolley asserts that it may have been the passage in Menabrea's paper that refers to 'imagination' (1999: 259) that suggested to Wheatstone the name of AAL as a suitable translator.

In an extract from an essay written by AAL on 5 January 1841, she ponders on the meaning of imagination, describing it as a 'Combining Facility. [...] It seizes points in common, between subjects having no very apparent connection, and hence seldom or never brought into juxtaposition' (Toole 1992: 136). AAL links imagination to science as a 'Discovering Facility [...] which penetrates into the unseen worlds around us, the worlds of Science' (1992: 136–7). Ada continues on this theme when she writes to her mother of the positive effects that her mathematical studies are having on her, particularly the 'immense development of imagination; so much so that [...] I shall in due time be a Poet', although she balances this with her 'scientific Trinity' of intuition, concentration, and reason (Toole 1992: 145). AAL experienced volatile mood swings and her letters reflect how at times she became carried away with her own grandiose ideas, which is perhaps her 'Byronic' side, and possibly the mental illness inherent in the Byron family that her mother so feared. In a letter to Sophia De Morgan on 21 December 1844, she talks of her illness and the 'mania and whims [she] has been subject to', with 'too much mathematics' being cited as a possible cause (Toole 1992: 309). AAL suffered frequent breakdowns in health and also from a nervous disorder. These incidents appear to coincide with particularly difficult periods in her life, for example the appearance in 1841 of Medora, the daughter of Byron's half-sister, and the revelation the Medora was most likely her father's daughter as well as her cousin. However, for all the upheaval in her personal life, AAL seemed to find solace in her research and studies.

Aware of their friendship and the interest that AAL took in Babbage's work, Wheatstone suggested to AAL that she translate the Menabrea paper. AAL, for her part, jumped at the intellectual opportunity it provided. Her knowledge of French proved an invaluable skill, but she also compiled a number of extensive notes that expressed not only her understanding of the mechanics of Babbage's invention but also its wider applications. It would be these notes that would lead to AAL being considered a pioneer in the field of technology and analytical thought. She must have worked very quickly

and devoted considerable time and effort to the project, as by early 1843 the first draft of the translation was complete and submitted to Wheatstone with a view to its appearing in *Scientific Memoirs*. While AAL was working on this project, Babbage had been very ill and so only knew of it once it was complete. He was very supportive of the translation and also of her publishing the accompanying Notes, offering to go through them with her.

It is outside the scope of this chapter to consider the mathematics of either the translation or the Notes, which have already been the subject of much debate, particularly by Dorothy Stein. Suffice to say that the Notes contain detailed equations as well as tabularized breakdowns of the pathways of the variables as they are processed by the Analytical Engine. Both the original paper and the Notes explain the concepts of the Analytical Engine. A punched card was required for each component of the operation: one card for the instruction (e.g. add, subtract, multiply, compare), two cards for the data to be input, and the final card for the result of the operation or output. The store, which was the memory, comprised a series of metal cogs each with ten teeth and with each cog representing a digit, holding the numbers and the instructions to be carried out. The ‘mill’ was equivalent to a central processing unit (CPU). The Analytical Engine incorporated in its design the concept of ‘loops’, where an operation can be repeated, and ‘conditional looping’, which corresponds to a program checking if a condition is met and then, depending on the result, triggering whether or not to repeat (or loop) the instruction. Even parallel processing is alluded to, where calculations take place at the same time. In the Notes, AAL moves from detailed explanations of the workings of the Analytical Engine, such as in the clarity of her explanation of the construction of the discs that store numbers, to more sophisticated ideas that, while they make sense now, may not have been so accessible at the time. For example, in Note B, AAL alludes to the idea of ‘how clearly it [the Engine] separates those things which are in reality distinct and independent and unites those that are mutually dependent’ (Toole 1992: 251–2), suggesting the modularity that is inherent in software design and underpins efficient and effective systems. Even in this very factual account, there are the visionary aspects that make AAL’s work so compelling. Christopher Green et al. explain that Note A, ‘Supposing, for instance, that the fundamental relations of pitched sounds ...’, ‘the science of operations’, suggests that the operations can act on symbols, for example musical notes, rather than just numbers (2001: 150). Green also discusses

the Analytical Engine and the possibility of a nineteenth-century ‘cognitive science’, claiming that both Babbage and AAL ‘are typically described as having foreshadowed the foundational article of faith of cognitive science – that human brains are, in essence, biological computers, and that human thought is no more than the running of a program on such a computer’ (Green et al. 2001: 133). Babbage could himself be poetical in his description of the material world, as shown in this extract from his Ninth Bridgewater treatise (1838): ‘Every atom, impressed with good and with ill, retains at once the motions which philosophers and sages have imparted to it, combined in ten thousand ways with all that is worthless and base. The air itself is one vast library, on whose pages are for ever written all that man has ever said or woman whispered’ (1838: 112–13). Richard Menke suggests that Babbage’s atoms ‘*were* the first bits [the basic unit of data in a computer]; [...] Babbage’s imaginary catalog of this real-world “library” turns the physical universe into a massive databank that is also a book, an immense history, a work of Victorian multiplot fiction’ (Menke 2008: 25).

By displaying what would now be called ‘helicopter vision’, AAL is able to move from the minute instruction, which forms part of an equation, to considering the wider applications, such as music synthesized by a computer. Toole comments how, in Note A, AAL is able to see the need for precision in order to communicate precisely to the Engine what it is required to do, and remarks on AAL’s appreciation of ‘the principle that power comes from disciplined creativity. ... Neither her analyst or metaphysical persona is allowed to overcome the other, resulting in a synergy of amazing potential’ (Toole 1992: 244). This illustrates how AAL is able to contain her natural exuberance to provide a balanced view of the machine that she is describing.

In terms of the language adopted by AAL in the Notes, this can be exemplified by Note A; when talking about the ‘calculus of operations’, AAL as translator distances herself from Babbage, commenting that ‘[w]hether the inventor of this engine had any such views on his mind while working out the invention, or whether he may subsequently ever have regarded it [calculus of operations] under this phase, we do not know; but it is one that forcibly occurred to ourselves’ (Menabrea and Lovelace 1889: 23). Effecting a professional stance, the note emphasizes AAL’s impartiality as a translator and her ability to express her own opinions and even to interrogate Babbage’s work. It is also significant that the Notes were attributed to AAL in the published edition.

Another interesting aspect of the Menabrea translation and the Notes is how AAL expresses an awareness of her writing style. Diana Basham notes, ‘she recognised, with astonishment and delight, a significant change in herself, the emergence of a new “masculine” writing persona’ (1992: 28). AAL wrote, in a letter in the summer of 1843 to Babbage, that she was ‘thunderstruck at the power’ of her own writing, ‘It is especially unlike a woman’s style surely but neither can I compare it with any man’s exactly’ (Toole 1992: 213).

The publication of the Menabrea translation and Notes transformed AAL’s profile in society. She had always been considered odd, often neglectful of her duties as a society hostess, and scandalous in the way that she would keep the company of men in a manner deemed inappropriate at the time, but now she felt she had an excuse as she was a ‘professional person’. However, despite her many projects, and possibly because of her ill health, more publications were not forthcoming.

AAL’s work on the Analytical Engine was not forgotten and was particularly acknowledged in the post-Second World War computer era by D.R. Hartree (1949), Alan Turing (1950), and particularly by B.V. Bowden (1971). However, her role also sparked debate. For example, Bruce Collier, a biographer of Babbage, comments that

[a]lthough it is clear that Lady Lovelace was a woman of considerable interest and talent, and it is clear that she understood to a very considerable degree Babbage’s ideas about the general character and significance of the Analytical Engine, and expressed them well in her notes to Menabrea’s paper, it is equally clear that the ideas were indeed Babbage’s and not hers (1990: 180).

Collier also says that while AAL

made a considerable contribution to publicizing the Analytical Engine, [...] there is no evidence that she advanced the design and theory of it in any way. And she did not even express an interest in learning about the machine until January 5, 1841 (1990: 180).

This seems rather harsh given the long-standing correspondence that suggests meetings and exchanges of documents going back a number of years. Collier continues, ‘[a]ll of this is not to belittle Lady Lovelace, but [...] a very exaggerated view has been formed by some writers of the significance of her contribution to the Engine or of her role in Babbage’s life’, adding that ‘[Maboth] Moseley’s *Irascible Genius* [1970], is the prime

example of this, devoting over a quarter of her biography of Babbage to material on Lady Lovelace' (1990: 181). Perhaps Collier was concerned that AAL was eclipsing Babbage's part in the development of the Analytical Engine.

Green et al. comment that AAL's claim of the Analytical Engine being a 'uniting link' between mind and matter suggests that she was considering 'mechanistic materialism' and that there is a tension about whether to see the Analytical Engine as a thinking machine or an automaton (2001: 146). This would have been contentious in a society that was still primarily following the teachings of the Church. Green also states that there 'can be little doubt that Babbage's main goal in working with Lovelace was to have a public show of support from a member of the nobility who might have some influence on the government' (2001: 142). There may have been some justification for this, given AAL's connections and the attention that her involvement could bring, but nonetheless she was female, an 'amateur', and daring to voice her own views on Babbage's device, and therefore AAL's involvement would be a risk for Babbage. Green concludes that Babbage's key objectives for the Analytical Engine were industrial and economic, as it could be argued that 'the powers of this engine served to distinguish precisely between those aspects of the human mind that were thought to be merely mechanical and those that were regarded as being truly original, creative, rational, and ultimately divine in character' (2001: 150). While this may be the case, and considering the implications of such inventions, for example Jacquard's loom resulted in mass unemployment in France, 'it is not that scientific progress should be stopped but that [...] [its] consequences should not be ignored' (Blohm et al. 1986: 85). Blohm et al. comment that AAL 'understood, perhaps better than Babbage himself, where all this [the Analytical Engine] would finally lead' (89), which was that technology would ultimately result in a fundamental change to working life as it could develop to fulfil many tasks that were previously undertaken by human labour.

The workings of the mind and how they might be investigated were of great interest to AAL. Her detailed exploration of the mechanisms of the Analytical Engine may well have inspired her desire to solve the mystery of the body-brain connections. Mesmerism would prove a subject that was full of conjecture and thus ripe for further research.

Ada Lovelace and her investigations into mesmerism

AAL did not limit her investigations to the technical applications of mathematics but also experimented with a number of ideas and theories that were circulating at the time. One such area of interest was mesmerism, a therapy that had become very popular in Victorian Britain but was also the subject of much debate in terms of its efficacy and propriety. AAL's curiosity was aroused and she was soon to be found at the heart of this subject, bringing her own enthusiasm and analytical methods to the investigations. Probing the mysterious claims of mesmerism by applying scientific reason and rigour provided the perfect opportunity for AAL to consider a topic that both resonated with her ideas on 'poetical science' and addressed the competing aspects of 'passion' and 'reason' within her own upbringing as the daughter of a Romantic poet (her paternal legacy) and a stern educator (her maternal legacy), respectively.

AAL first came to mesmerism through her mother. Despite Byron's famous description of Lady Byron in an 1818 letter to Thomas Moore as 'the mathematical Medea, [Ada's] mother, who thinks theorems and speaks problems';⁹ and his likely reference to her in his famous poem *Don Juan*, written in the same year, as 'she was a walking calculation' (1837: 592), this may not be a fair portrayal. Certainly she studied mathematics but she also wrote poetry, sending her work both to Byron before their marriage and to the poet Joanne Bailey. It would also appear unlikely at first that the staunchly religious Lady Byron held strong beliefs in what Diana Basham calls 'occult experimentation' (1992: 14), particularly phrenology and mesmerism. However, Sophia De Morgan offers an explanation for why such matters held a fascination for Lady Byron, '[t]here was one reason, perhaps for her belief that one day an open link might appear in that great mystery, expressed so perfectly, as [Lady Byron] said, by Lord Byron: "The electric chain wherewith we are darkly bound"' (De Morgan 1895: 216). The quote given here is from Lord Byron's *Childe Harold*¹⁰ and suggests the strange unknown forces that are at work within and around us. This is particularly apt given the scientific research being carried out by Faraday and others, as well as the universal magnetic fluid proposed by the mesmerists. Sophia De Morgan goes on to explain that Lady Byron's mother, Lady Milbanke, was a successful water diviner, although

⁹ This passage from Byron's letter of 9 February 1818 was omitted in Thomas Moore's 1832 *Life of Lord Byron*, but the full text was included in Leslie A. Marchand's 1981 edited edition of *For Freedom's Battle: Lord Byron's Letters and Journals*, Volume, 11, p. 197.

¹⁰ From *Childe Harold's Pilgrimage*, Canto IV, Stanza 23, line 207 (1818).

correspondence from the time states that Lady Milbanke disliked ‘speaking of or exhibiting this gift’ [an extract from a testimony from 1838 is reproduced in the memoirs (1895: 217–20)]. This suggests that Lady Byron was brought up in an environment where out-of-the-ordinary events took place and also was more of a poet than would superficially seem to be the case in the austere figure that she sometimes presented in later life. Basham suggests that Lady Byron changed as a result of the sensational ‘Separation Drama’ (1992: 11) and that ‘she was looked to as an authority on spiritual suffering, and as an illustration of female managerial enterprise’ (13). Diana Basham describes the thorough methods that Lady Byron undertook when researching her social projects, for example, ‘[s]he visited existing institutions, prisons, lunatic asylums, even a convict ship, read articles recommended to her [...] and before setting up her own school at Ealing Grove, sent an emissary to Switzerland to acquire first-hand information [on the subject]’ (1992: 17). Therefore, it seems that, in her mother, AAL had a model for carrying out her own investigations.

Ada wrote to her mother freely about her own medical ailments. Illness was a subject of great interest to Lady Byron, who seems to have been troubled with many afflictions herself. Elizabeth Blackwell, who was to become the first woman to receive a medical degree in the USA, reported in a letter to her sister that ‘I never met with a woman whose scientific tendencies seemed so strong. She seemed well versed in medicine and was her own physician, having consulted many physicians who were quite unable to aid her’ (Blackwell 1895: 183).

As a young girl, AAL was exposed to her mother’s interest in the different types of medical therapies available. Sophia De Morgan recalls AAL’s experience of phrenology, another of Lady Byron’s interests, at an early age:

The head showed imagination, wonder, constructiveness and harmony, with very high intellectual powers. How could these fail of making a poet? We found a solution of the difficulty. Language was not so powerful as the others; had it been so, there would probably have been a musical poetess instead of, or perhaps as well as, a cultivated poetical musician. As has been often noticed in other cases, music and mathematics were indicated in this head, and were both strong elements of character (1895: 179–80).

Although AAL, according to Woolley, was sceptical, she did visit a phrenologist in adult life (1999: 198–200).

The first reference to mesmerism appears in a letter from AAL to her husband, Lord Lovelace. Lady Byron had attended a demonstration of mesmerism and had seen the famous shilling experiment in early 1838 (where a shilling tied to a thread and suspended in a glass is ‘willed’ to move) (Toole 1992: 102–3). This demonstration was quite possibly given by John Elliotson, who, at the time, was a well-respected surgeon and professor of medicine at University College Hospital in London. Elliotson was also one of the first in the medical profession to embrace the practice of mesmerism.

Inspired by her mother’s experience, AAL recreated the experiment herself, noting that she experienced a very strong reaction, not just in the movement of the coin around the glass, but also in terms of physical sensations in her finger and thumb, as well as a feeling like a current flowing at the top of her head. This may suggest that she was sensitive to the experiment, or to the idea of it, or somehow, involuntarily or otherwise, directed the movement of the suspended shilling, and perhaps imagined the physical sensations. This may well have been an example of what Carpenter described in 1852 as the ‘ideomotor effect’, which linked suggestion to involuntary movement (1852: 147–53).

By 1841, AAL was in touch with Elliotson. However, by this time, Elliotson had become a controversial character. His experiments with mesmerism, particularly his public displays, had led to accusations of theatricality and even fraud by *The Lancet*, which had been founded in 1823 by Thomas Wakley. As a physician and medical reformer, Wakley’s intention was to publish a weekly journal devoted to raising the standards of the medical profession. He campaigned to eliminate corruption, demanding close scrutiny and reporting of surgical cases, as well as the use of plain English. Using the concept of a lancet as an incisive medical instrument, as well as a window into clinical practice (Sharp 2012: 1916), the aptly named journal helped to establish evidence-based medicine (Jones 2009: 406). Wakley had a particular dislike of anything that might be construed as quackery, therefore it was only a matter of time before the extravagant claims of John Elliotson and his mesmeric performances became the focus of his investigation.

Elliotson’s serious research into the phenomenon was compromised by his involvement with two sisters, Elizabeth and Jane Okey, whom he treated for epilepsy. The sisters proved highly susceptible to mesmerism, slipping easily into a trance. While in this state, they seemed to undergo a change in personality, interacting with the

audience in a quite uninhibited way. Although this behaviour caused a stir, the Okey sisters also started to visit hospital wards and, claiming the gift of clairvoyance, would offer prognoses on the patients. Thomas Wakley arranged for the Okey sisters to demonstrate their powers at his house and in front of a number of notable witnesses. The sisters had to distinguish between magnetized and unmagnetized water. They failed to do this consistently, which *The Lancet* took as proof that they were fakes. These events incurred the displeasure of University College, as it was felt that Elliotson was bringing the institution into disrepute. Elliotson resigned from his post in December 1838 but continued in private practice, setting up *The Zoist* magazine as well as later founding the London Mesmeric Infirmary. Wakley and *The Lancet* would continue to oppose and discredit Elliotson and his activities. The Elliotson case illustrates well the opposing aspects of mesmerism, with, on the one hand, the serious medical investigator and, on the other, the more sensational performance aspects. This contradiction was to compromise the efforts of the mesmerizers to be taken seriously by the scientific community.

Despite the scandal attached to Elliotson, AAL continued to attend his demonstrations. She wanted to investigate the phenomenon further, as well as to involve her own circle, including Michael Faraday, Mrs (Mary) Somerville, Charles Babbage, and her physician Dr Charles Locock. AAL hosted and attended mesmeric performances during the summer of 1841. While AAL herself did not document these, Dr James Kay, a physician and an educational reformer, who later became Sir James Kay-Shuttleworth, recorded these events in his diary. Dr Kay was a friend of Lady Byron but became, according to Toole, ‘totally captivated’ by AAL (1992: 163); indeed, he described her in one letter as his ‘Will o’ the Wisp’ and, as Woolley notes, ‘there are few direct references to Ada in his journal, for reasons of discretion (it was written to be read by others, including members of his own family)’ (1999: 232–3). Kay describes being invited to the Lovelaces’ home in St James’s Square for ‘some mesmeric experiments’ (Kay-Shuttleworth 1841, Extract 3). On 9 July, he attended Charles Lafontaine’s mesmeric experiments, although it remains unclear whether this was the same event hosted by the Lovelaces the previous week. Lafontaine was one of the most famous mesmerists and had only just arrived in England from Europe, therefore it would have been quite an event to see him. Kay described the room as full and mentions that Mr Townshend (possibly Chauncy Hare Townshend, the poet, clergyman, and

mesmerist) and Dr Elliotson were there. Kay records:

Lafontaine was in an adjoining apartment, and the subject of the experiment a young man seated in a chair near the window. I was informed by Mr. Townshend that Lafontaine had assured them that the patient would be affected from the adjoining room, and that he accordingly had fallen into an apparently cataleptic slumber. After waiting some time Lafontaine came in. A coarse porcine man, with a coarse thick head and moustache. He put the patient in various positions to show that he was in a state of catalepsy. Sometimes he placed a limb in tonic spasm [sudden stiffening] and sometimes on clonic spasm [twitching] [...]. He stuck a pin forcibly into the patient's forehead, and subjected him to the influence of a powerful galvanic apparatus without eliciting any sign of pain; though a gentleman in the room was unable to support the influence of the galvanic battery more than a few seconds. He then by some paper [power?] restored the sensibility to the arms of the patient, and he was immediately unable to bear the galvanic current, though not roused from his comatose state. Then Lafontaine introduced a young woman about 20 or 22 years of age, who we were assured by Mr. Squire had been Deaf and Dumb from birth. She had been previously operated on by Lafontaine, and she could now hear monosyllabic words uttered close to her hear [sic] in a moderately elevated tone of voice. This was a pleasing experiment, the previous one, as well as the operator preeminently disgusting (Kay-Shuttleworth 1841, Extract 11).

This account gives some idea of the performance aspects of the mesmeric 'experiments', which would appear less than scientific. According to Woolley, at one such mesmeric demonstration in 1841, AAL had a very strong feeling of being 'overwhelmed by the mesmeric miasma and experienced unnatural feelings, mental and bodily' (1999: 235). AAL alluded to this again a few years later, in October 1844, when she wrote to her mother that she attributed the ill health that she experienced to being 'a victim to those mesmeric experiments in 1841' (Toole 1992: 282). But, on a more positive note, AAL observes that 'a sort of experience has been gained by means of this horrible episode [...] that I have been slackened in order to gather wind and vigour, & to bound past those who may seem now to be more securely in advance of me' (283). This also suggests a rather competitive spirit.

At the same time that AAL expressed her intention to investigate mesmerism, Harriet

Martineau, a friend of Lady Byron and a well-known writer and social reformer, was preparing her *Letters on Mesmerism* (1845), describing her return to health as a result of the treatment. Her work contributed towards raising public interest in the cure. AAL had seen some of the letters, possibly in advance of publication (as she noted in correspondence dated 1844; Martineau's letters were published a year later). Diagnosed with a uterine tumour, Martineau retired to Teignmouth in 1838, where she spent five years as a bed-ridden invalid. She wrote of her illness being 'the result of excessive anxiety of the mind—of the extreme tension of nerves under which I [Martineau] have been living for some years' (Martineau 1877: Vol. 2, 150). Diana Postlethwaite comments that Martineau helped to promote the debate among her biographers as to whether her illness was indeed a tumour or psychosomatic (1989: 585). Martineau wrote, 'a tumour is forming of a kind that usually originates in mental suffering' (Martineau 1877: 2, 151) and, as Postlethwaite notes, '[s]he echoes the medical opinion of her day, believing in a direct connection between the uterus and the emotions defining "hysteria" as a distinctively feminine disease' (1989: 588).

Harriet Martineau's experience with mesmerism started when the famous mesmerist Spencer T. Hall came to visit her in Teignmouth, but his attempts to mesmerize her failed. However, her maid was more successful as she was able to mesmerize Martineau, whose health was soon restored. Although not previously a believer in the power of mesmerism, Martineau wanted to share her experiences and published her *Letters on Mesmerism*. In response to this, Thomas Greenhow, who was both her brother-in-law and her physician, published a graphic description of her gynaecological history, with a condensed version appearing in *The Lancet* in 1845. Greenhow's conclusion was that her recovery was one of 'progressive improvement', as he would have expected, and noted 'an additional symptom of morbid influence over the nervous system' (1845: 19–20). Martineau followed up with a repudiation of Greenhow's report that was printed in *The Lancet* two weeks later. However, Martineau's reputation in this matter was not helped by the claims that her maid had also developed clairvoyant skills while in her mesmeric trance state, thus leading her to be mentioned in the same terms as Dr Elliotson and the Okey sisters. Nevertheless, Harriet Martineau continued to write but eschewed metropolitan life for a rural existence in the Lake District along with her maids.

Martineau's illness bears similarities to AAL's own health issues, involving both

emotional stress and physical gynaecological problems. Postlethwaite draws attention to the debilitating effect of Martineau's domineering mother and associates this with her collapse, an event that allowed her to 'escape a difficult situation without having to take responsibility for that escape' (1989: 594). After her cure, Martineau felt able to start a new and independent life without her mother. As Postlethwaite goes on to say, 'Martineau used mesmerism to explore the interactions of passivity and power through the inwardly directed, emotional self-exploration of her illness' (1989: 604).

Like Martineau, AAL had a complicated relationship with her mother: she was very close to her, as evidenced by their correspondence, and often relied on her for emotional, practical, and financial support; however, there were times when AAL rebelled against 'the hen', as she called her mother in her letters. One of the areas where AAL challenged her mother was in the practice of mesmerism, and she could do this through rational investigation.

AAL wrote to her mother that she wanted to 'draw [Miss Martineau's] powerful understanding to the subject, more systematically and forcibly, than perhaps would occur unless she is a little suggested to' (Toole 1992: 283). This implies that in AAL's view, Martineau's account should provide more evidence for the treatment in order for it to be taken seriously by the medical fraternity (although, of course, this may not have been Martineau's intention). Certainly, Dr Locock had already mentioned to AAL that he had read Martineau's first letter and that while he 'wholly disbelieved that any organic disease ever had been or could be cured by mesmerism', he did think that states of health had been and 'could be benefited by its measures' (282).

AAL had discussed the topic a number of times with her physicians. She wrote in a letter to her mother, which Betty Toole dates as most likely 1844: 'I should say that he [Dr Locock], Dr Forbes & Dr Carpenter [...] doubt if mesmeric effects will ever be produced when the mesmerer [sic] is ignorant of what is going on' (Toole 1992: 281). This view is further supported in another of AAL's letters, where she notes that Charles Wheatstone, while believing the physical effects of mesmerism, 'doubted the clairvoyance that was said to accompany the mesmerized state' (Toole 1992: 303). The idea that the power of suggestion was at the heart of mesmerism seems to be the prevailing view among the scientists and physicians, just as it was found to be by the French Royal Academy in Mesmer's time.

Although AAL appeared to agree with her medical and scientific circle on the effect

of suggestion on mesmerism, she wanted to take the matter further. During the time of her illness in 1841, AAL had noted in a letter to Lady Byron that one theory on mesmerism stated that ‘it is an abstraction of the electricity of the body, electricity being the bond between mind and muscular action’ (Toole 1992: 157). When describing her further bouts of illness to her mother in November 1844, she mentions ‘Galvanization’ and describes her body as ‘a frame so susceptible that it is an experiment laboratory always about me, & inseparable from me. I walk about not in a snail-shell but in a Molecular Laboratory’ (Stein 1985: 291). She wrote to Woronzow Greig about Martineau’s letters in November 1844:

There can be no doubt of the facts. I am persuaded. [...] All this bears on my subject. [...] I hope to bequeath to the generations a Calculus of the Nervous System (Toole 1992: 296).

The effect of magnetism and electricity on the ‘brain, blood & nerves of animals’ had fascinated AAL for some time and seems to be connected both to her own frequent illnesses and to her studies of animal magnetism. AAL wanted to study the effects of electricity on the nervous system and to use her own body as the basis of experiments, perhaps to cure herself of the illness that continually dogged her. Iwan Rhys Morus notes that AAL ‘was trying to frame a feminine view of electricity at odds with the perspective of scientific gentlemen’ (Rhys Morus 2011: 9) and that, as in the case of Harriet Martineau’s writings on her own illness that attracted such vilification from the medical community, it would be ‘presuming to put her own personal experience and testimony against the weight of the authoritative opinion’ (98).

Unlike AAL’s letters, Harriet Martineau’s writing was meant for public consumption. Martineau’s documentation of her illness in published form was unusual at the time. Anne Hunsaker Hawkins comments that ‘autobiographical descriptions of illness [...] belong almost exclusively to the second part of the twentieth century’ (1999: 11). Prior to that, as in AAL’s case, these were confined to letters and diaries but were placed among other events. Hawkins suggests that this was because illness and dying were ‘considered an integral part of living (and dying)’ (11). If AAL were to publish her findings on mesmerism, particularly if she were to carry out experiments on herself, she would risk public ridicule and scandal as Martineau had, perhaps more because of her rank and status as Byron’s daughter.

AAL was determined to pursue her experimental path. With Faraday claiming that he

was too ill and too old to help Ada in her quest to learn how to perform her electrical experiments, she went to Andrew Crosse. Crosse was known locally as the ‘thunder and lightning man’ for his investigations into electricity, but also a man who the scientific community viewed somewhat suspiciously, partly because of reported claims that he was recreating life by hatching insects from rocks. AAL stayed with the Crosses in the autumn of 1844 and during this time she struck up a friendship with John Crosse, the eldest son of Andrew Crosse. Through John Crosse, she learnt of:

The scientific doings in Germany [...] & he [John Crosse] will undertake if I choose, to be my organ to any extent he can in procuring me every means of keeping au courant as to German mathematics & Natural Philosophy (Letter from AAL to Lord Lovelace, transcribed in Toole 1992: 297–8).

AAL’s ambitions were fuelled by John Crosse reporting that there was a huge market in Germany for science literature, and she told Lord Lovelace that ‘I believe that many of my subjects would be read to an extent, in that country, which they never would here, (besides paying well) ...’ (Toole 1992: 298).

While not fulfilling her ambition ‘to write German scientific treatises’, AAL did continue her work to some degree, including drafting a review on the research into the work of Baron Karl von Reichenbach. In 1845, Reichenbach, the distinguished scientist whose discoveries played an important part in establishing the vast German chemical industry, published his ‘Researches on Magnetism, and certain allied subjects, including a supposed new Imponderable’. These researches consisted of two substantial supplements to the prestigious periodical *Annalen der Chemie und Pharmacie*, and their content linked back to the earlier controversial theories of Anton Mesmer on the properties of animal magnetism; Reichenbach would later call his ‘imponderable’ vital force Od, after the Norse god Odin. The startling claims and detailed experimental accounts from such a respected man of science soon caught the attention of William Gregory, Professor of Chemistry at Edinburgh University. Keen to bring Reichenbach’s findings to a wider audience, Gregory quickly translated this work into English, producing an abstract that even in its abridged form covered over 100 pages (Reichenbach 1846). This was the first of a number of publications by Reichenbach on the subject, and his theories on Odic force became an influential concept both in

investigations into the paranormal and in later nineteenth-century literature.¹¹ I will now consider how these first researches were presented and received, in particular examining the work undertaken by AAL as well as the review published by James Braid.

James Braid, a Scottish physician who had trained at Edinburgh University and ran a surgical practice in Manchester, had carried out some notable studies into mesmerism, offering a more ‘rational’ approach and so retaining, unlike Elliotson, an acceptable presence within the scientific community. Braid introduced a more psycho-physiological approach, which later became known as hypnosis. Braid’s involvement in the field started in November 1841 when he attended a *conversazione*¹² at the Manchester Athenaeum. This featured a demonstration of the mesmeric arts by Charles Lafontaine, the same Lafontaine who appeared at the gathering in London with Dr Kay and the Lovelaces as noted earlier in the chapter. In fact, Dr Kay was also in attendance at the event in the Manchester Athenaeum, along with a number of other physicians and scientists. There is no evidence to suggest that AAL and Braid ever met, although they would have had a mutual acquaintance in Dr Kay.

Braid had read the reports on mesmerism in the medical press and, particularly in the wake of *The Lancet*’s critical stance on the practice, was sceptical about the therapy, which ‘determined me [Braid] to consider the whole as a system of collusion or illusion, or of excited imagination, sympathy, or imitation’ (Braid 1843: 35). Nonetheless, he was keen to see for himself how mesmerism worked. The local newspapers documented the *conversazione*: after an essay explaining the ideas behind mesmerism was read aloud in English by a translator (Lafontaine spoke only French), Lafontaine moved on to give a demonstration of animal magnetism by putting members of his own retinue into a trance and subjecting them to a series of trials to test their physical senses, for example subjecting them to sudden noises and electric shocks and pricking them with pins. The *Manchester Guardian* reported that a number of ‘medical gentlemen [from the audience] [...] made examinations during the experiments’ (Anon. 1841a: 3). Volunteers were then taken from the audience and Lafontaine attempted to mesmerize them, succeeding in one of the three men who came forward. By the end of the evening,

¹¹ For example, AAL’s friend Edward Bulwer-Lytton wrote *A Strange Story* (1861), which links mesmerism to electrobiology, von Reichenbach’s Odic force and an electric fluid. This idea in *The Coming Race* (1871) is developed further and becomes the technical force ‘vril’. *Zanoni* (1842) and *The Coming Race* also contain the association of mesmerism with utopian social ideas (van Schlun 2017: 141).

¹² A *conversazione* was a term often used in the nineteenth century for a social gathering for those involved with the sciences or the arts, where a particular subject would be discussed.

however, rather than dismissing the phenomenon, Braid decided that he wanted to investigate further what he had seen. He noted that:

I saw one fact, the inability of a patient to open his eyelids, which arrested my attention; I felt convinced it was not to be attributed to any of the causes referred to [i.e. mesmerism], and I therefore instituted experiments to determine the question; and exhibited the results to the public in a few days after (Braid 1843: 35).

Attending subsequent Manchester performances by Lafontaine, Braid began to develop the idea that the ‘magnetic sleep’ seen in the demonstrations involving members of the audience was actually due to ‘a peculiar condition of the nervous system, induced by a fixed and abstracted attention of the mental and visual eye, on one object, not of an exciting nature’ (1843: 12). Feelings clearly ran high at these meetings, for the *Manchester Guardian* noted the disturbances that occurred when Braid and his medical colleagues challenged Lafontaine to respond to a letter that Braid had sent to him concerning the suggestibility of those who had previously been the subjects of Lafontaine’s experiments (Anon. 1841b: 3).

Braid worked on developing his own ‘double internal and upward squint method’ and experiments to reproduce the effect, which initially involved a cork bandaged to the forehead of the participant (Anon. 1841c). The following month, Braid’s findings were presented and demonstrated in a series of lectures that took place in Manchester from late 1841 and into the spring of 1842, which were chronicled in some detail by the *Manchester Guardian*. Braid also lectured across the country and in London. This was, however, the start of a long and often difficult campaign to establish work in the area, as Braid encountered not only misrepresentation from the mesmerists and phrenologists, but also opposition from the Church and criticism from some in his own profession. However, in 1843 Braid published *Neurypnology*, which served to explain his research as well as to document his various articles and lectures. *Neurypnology* also formally introduced Braid’s use of the term ‘hypnotism’ (1843: 4), originally neuro-hypnology,¹³ to represent a ‘nervous sleep’; that is, one effected by the action of the nervous system. Braid also offers suggestions to explain the behaviour or responses exhibited by those in a state of trance, stating that:

¹³ John Kihlstrom notes that Braid ‘initially added the prefix neuro- to make clear that hypnosis had a material basis in brain activity’ (2013: 2).

The oftener patients are hypnotized, from association of ideas and habit, the more susceptible they become [...]. Thus, if they consider or imagine there is something doing, although they do not see it, from which they are to be affected, they will become affected (1843: 36).

Braid went on to use hypnosis both as a treatment and as a surgical anaesthesia. Derek Forrest notes that Braid's achievements were 'that he had redirected the attention away from the mesmerist's personal powers to physiological and psychological processes in the subject, and that his approach made hypnotism more scientifically acceptable than mesmerism had ever been' (2000: 46–7). His work was to become crucial to the development of neuropsychiatry later in the nineteenth century, particularly in France.

With AAL's and Braid's investigations into the issues surrounding magnetism and suggestion, their interest in Gregory's translation of Reichenbach's work is unsurprising. The publication of Gregory's translation was widely known and discussed. Sophia De Morgan in her memoirs describes Anna Jameson, the Irish writer and friend of Lady Byron, as 'what Reichenbach calls a "sensitive"' (1895: 215) when she displayed supernatural gifts at a soirée (1895: 215).

AAL's review is a thirteen-page hand-written draft that offers an interesting insight into her conceptual approach to science. There is no documentation to suggest that this review was submitted for publication and, as Stein notes, 'it is impossible to know why not, but one guess would be that she was forestalled by the appearance of a review of the same work by James Braid' (Stein 1985: 153). However, a number of reviews, as Braid notes below, were published on the abstract. Elliotson wrote a review of Gregory's von Reichenbach abstract, which he published in his magazine, *The Zoist*, in 1846, but strategically used the work as a vehicle to justify his own findings when investigating mesmerism.

Braid's thirty-page 'experimental inquiry' into Reichenbach's work comments on how opinion is divided by the many reviewers:

The vast interest which the above-named brochure has created, is evinced by the extent to which it has been quoted, referred to, and reviewed in our numerous periodicals. [...] Nor is it devoid of interest to observe the various awards of these different authorities. [...] Between these two extremes, again, we have every grade of approval or scepticism (1846: 3).

Braid explains his own reasons for carrying out his inquiry:

I felt confident that, however carefully and perseveringly he [Reichenbach] had prosecuted his experiments, and however well-calculated they had been for determining mere physical facts, still no reliance could be placed upon the accuracy of conclusions drawn from premises assumed as true, where especial care had not been taken to guard against the source of fallacy to which I refer—viz., the important influence of the *mental* [sic] part of the process, which is in active operation with patients during such experiments (1846: 4).

The ‘inquiry’ goes on to establish Braid’s objective ‘to repeat his [Reichenbach’s] experiments, paying the strictest attention to this point [‘influence of the *mental* part of the process’]; and, as I had anticipated, the results were quite opposed to the conclusions of Baron Reichenbach’ (1846: 5). AAL concurs with this view in her draft, when she comments on ‘facility for experimenting under a variety of circumstances’ (Lovelace c.1846: folio 3).

In her review, AAL first addresses the readership for this ‘important pamphlet’. She says that it is ‘both for the strictly scientific and for the intelligent public’ (Lovelace c.1846: folio 1). This is already a radical statement as the dissemination of knowledge was a sensitive issue at the time. James Secord discusses ‘literary lionism’, which ‘maintained the ideal of a select readership among the gentry and aristocracy, who could converse directly with leading authors’ (2003: 178), as only those in the know would be at the select social events where these authors would be present.

AAL continues her contentious stance by stating that ‘[t]he experiments are many of them of such description as to be easily & satisfactorily performed by amateurs’ (c.1846: folio 1). This again challenges the Establishment hierarchy, for as Iwan Rhys Morus notes, ‘natural philosophy was the preserve of the few rather than the many [...] science was to be regarded as a vocation that was accessible to only a privileged few’ (2011: 98). The suggestion of de-institutionalizing experiments and involving ‘laypersons’ would presumably not have gone down well with the scientific community, particularly in view of the ‘protectionism’ that seemed to accompany empirical research. Alison Winter states that ‘Whenever mesmeric experiments took place, a little bit of Britain was transformed into a laboratory for studying social relations [of class and gender]’ (Winter 1998: 7), rather like AAL’s note on the reproducibility of Reichenbach’s experiments.

In AAL’s review, the final sentence on folio 1 begins: ‘If amateurs would amuse

their idle hours with experimenting on their subjects & ...'. In the original manuscript it can be seen that the sentence previously read, 'if amateurs of either sex would amuse their idle hours', but the 'of either sex' has been crossed out. This may be because AAL thought that an overt reference to women carrying out experiments was too strong, or perhaps she was advised to delete these words. However, this implies that AAL was aware of the issues surrounding women and challenges to their role as experimenters.

As the review progresses, AAL acknowledges the superior knowledge and experience of the scientific fraternity:

We point this out, not because we should attach the same degree of value to the experiments of amateurs as to those of the philosophical & experienced manipulators with Nature's secrets (c.1846: folio 1).

AAL goes on to explain her rationale for this proposal:

Very numerous observations of experiments will be desirable in order completely to test the reality of the facts brought forward by Baron von Reichenbach. If amateurs would amuse their idle hours with experimenting on their subjects & should keep an accurate journal of their daily observations, this should in a few years have a mass of registered facts to compare with the investigations of the scientific (c.1846: folios 1–2).

Here, AAL is promoting the idea of recording data and building up a database of results that can then be used for analysis.

Braid had already introduced his term hypnotism, but AAL also connects 'mesmerism' and 'animal magnetism' to charlatanism and occultism, suggesting that these names should be dropped and replaced with something without such sensational connotations. She states that: 'We could wish even the name Mesmerism to be dropped. We associate with it a disgusting tissue of human imposture & weakness' (c.1846: folio 9); others had the same thought and this is believed to be the reason for the introduction of the term 'hypnosis' by Braid.

AAL's fascination with technology also surfaced in her review. She commends the use of 'a Daguerotype [sic] plate enclosed in a large dark chest with a Magnet' as 'it affords the means of testing the magnetic emanations without the aid of a human re-agent [sic]', but she does not reproduce the experiment herself. However, as with the Analytical Engine, AAL is quick to understand the potential of technology, stating that

‘Photography should become a most invaluable instrument of experimental investigation on the occult & subtle forces of nature’ (c.1846: folio 6). Braid did carry out the experiments (1846: 27–8) but found no light being emitted from the magnets.

In her review, AAL provides a clear account of the different components of the sections in the abstract. As is the case with Braid, she is also clear about being ‘very sceptical of human influences’ (c.1846: folio 7) and states that Reichenbach’s work ‘is invaluable as opening out the completely new & infinite fields for investigation, both in the organized and inorganized world; and as indicating tracks for connecting together branches of natural science hitherto unlinked; for instance terrestrial magnetism & human physiology’ (folio 12). However, the remark that the ‘hint’ in her review is ‘carelessly and hastily thrown out & would require nice & close consideration as to how it might be followed up [...] We have not ourselves fully examined the subject’ (folio 12) suggests that this was a work in progress and while it is not a fully fledged paper, or one that might meet AAL’s exacting standards, she is illustrating that her ideas are structured and her method critical.

There were a number of claims made by Gregory in his Preface that other studies supported the findings of Reichenbach’s work. At the time of the publication of Reichenbach’s abstract, Faraday was conducting a series of experiments into electromagnetism and light. This was commented on by Gregory in his Preface, where he notes that ‘Baron von Reichenbach’s discovery of the luminous appearance connected with the magnet has been so soon confirmed by the researches of Faraday’ (Reichenbach 1846: vi). This statement would seem to refer to Faraday’s research that resulted in the phenomenon known as ‘Faraday’s rotation’. Faraday’s experiments and findings on the topic were published in the *Philosophical Transactions of the Royal Society of London* in January 1846 and demonstrated the effect of a magnetic field on polarized light passing through a medium, where the medium was heavy glass or ‘aqueous solutions’ (Faraday tried 150 or more). The experiments showed that the plane of polarity was rotated by the action of a magnet in such a case, a finding that was significant to the understanding of electromagnetism. This may imply that magnets can directly affect light, but, very basically, it is the electrons in the material of the medium that are affected by the magnetic field, which in turn alter the angle of polarization of the light passing through the material. Therefore, Faraday’s researches do not confirm Reichenbach’s ‘luminous appearances’ but are a different phenomenon. AAL notes in

her review that she ‘shall perhaps in a second notice, consider Reichenbach’s experiments in connection with Faraday’s recent researches on a somewhat similar subject’ (Lovelace c.1846: folio 13). No such notice appears to have been prepared but it is interesting to muse on what her conclusions may have been, as AAL has identified that while Faraday’s work is ‘on a somewhat similar subject’, it is not the same and requires further investigation. This illustrates how the exhaustive work that AAL carried out on the Analytical Engine stood her in good stead in terms of problem solving, in this case breaking the subject down and comparing each aspect in detail.

AAL’s comment that ‘We trust that there are dawning indications of the time when some great atomic law may unite & harmonize all nature’ (Lovelace c.1846: folio 13) echoes Faraday’s own words:

I have long held an opinion, almost amounting to conviction, in common I believe with many other lovers of natural knowledge, that the various forms under which the forces of matter are made manifest have one common origin; or, in other words, are so directly related and mutually dependent, that they are convertible, as it were, one into another, and possess equivalents of power in their action (c.1846: 1–2).

This enquiry into the nature of matter and its common origin suggests an integrated approach, particularly in relation to the concepts of electricity and magnetism, reflecting Faraday’s own discovery of electromagnetism which had such a profound effect on the production of power. However, confirmation of the discovery only came about through his tenacity of belief and continued experimentation. AAL’s remark suggests that she has some comprehension of Faraday’s ideas, which also reflects her own strong belief in working through and testing ideas to achieve empirical results.

Gregory mentions in relation to Reichenbach’s conclusion, ‘that the new power existing as it does in crystals, as well as in magnets, plays an important part in crystallisation, [this] has also received powerful confirmation from the recent researches of Mr Hunt’ (Reichenbach 1846: vi). This refers to the work of Robert Hunt, a geologist, on the influence of magnets on crystallization. However, Hunt’s experimental results did not produce any conclusive results, and while later in the nineteenth century further investigations into magnetochemical effects were carried out, as reported by Roberto Martins, ‘the effect was weak and its practical importance was negligible. The subject was gradually forgotten’ (2011: 157, 161). This suggests that even eminent scientists

such as Reichenbach and Gregory were not questioning enough or applying sufficient rigour to experimental results in the former and bias in the latter, something that both AAL and Braid warn of in their reviews.

AAL shows her knowledge of the research in progress at home and abroad by referring to Carlo Matteucci's research at the University of Pisa (c.1846: folio 12), which led to the measurement of genuine animal electricity from the muscles of frogs and other animal preparations (Piccolino and Wade 2012: 645). She suggests here further experiments to test 'the magneto-crystalline effects [...] in the living animal nerve' (c.1846: folio 12), which would be in line with her interest in the function of the nervous system and her ambition to produce a 'Calculus of the Nervous System'.

Gregory also includes an appendix that references Haygarth's 'Bristol experiments', which were documented in a paper entitled 'Of the imagination, as a cause and as a cure of disorders of the body; exemplified by fictitious tractors, and epidemical convulsions' (Haygarth 1800). This was an important step in establishing the placebo effect. The experiments involved the claim by an American physician, Elisha Perkins, that metal tractors would relieve rheumatism by their magnetic healing properties. Haygarth orchestrated a number of experiments with Mr Richard Smith at Bristol Infirmary, where wooden tractors were substituted for the metal ones and achieved the same result. Gregory's criticism seems to lie with the fact that further experimentation should have been carried out to determine definitively that imagination 'is the agent which produces these phenomena' rather than 'the action of the nervous system as effected by external causes' (Reichenbach 1846: 110–11). AAL expresses her agreement on the matter, which is unsurprising given her continued fascination with the nervous system and her dedication to the importance of exhaustive experimentation.

While not able to endorse Reichenbach's 'imponderable', Braid's diligent efforts to reproduce Reichenbach's results through replication of his experiments and AAL's exploration of the possibilities offered by the detailed instructions within Reichenbach's work provide a powerful example of the different sides of science. Together they illustrate the need for rigour and reproducibility, of being careful not to be 'too easily operated on by imagination & enthusiasm' (Lovelace c.1846: folio 3), but also the need to relate research to people, regardless of class, creed, or gender.

The subject of mesmerism did not disappear from AAL's life. In February of 1849, she wrote to her mother, who seemed to be pressing her to consider the topic further:

As for Mesmerism: [...] I am more disposed to believe even in errors of my own senses, & in being my self-deceived than in what is so contrary to all my previous experience & philosophy. [...] I don't want you, or anyone else, to disbelieve. [...] I don't mean that no evidence could convince me. But it would require very strong, & I think repeated evidence (Toole 1992: 347).

This shows AAL to be tolerant of others' beliefs but also strong in her own conviction of requiring firm evidence, a legacy from her understanding of the scientific method, before committing herself on such a controversial subject.

At this time, too, AAL was still trying to engage with science, investigating the experiments of phrenologist and mesmerist Mr John Rutter, who had invented the 'magnetometer', a machine consisting of a metal ball hanging from a wooden frame, where the ball would oscillate as a result of a finger being held on the frame. Although the actual metal ball of the magnetometer was not touched, Carpenter's principle was described in his 'ideomotor effect', where operator expectancy results in muscular movement. Despite this, Lady Byron was quite evangelical in her quest to convince others of the efficacy of the device. She wrote a long letter to Elizabeth Blackwell, who was now practising medicine in New York, in December 1851, explaining the workings of Mr Rutter's machine, and promised to send a pamphlet (Blackwell 1895: 191–3). Sophia De Morgan talks of Mr Rutter's experiments, carried out between the years 1845 and 1850, and also of a Dr Léger. Lady Byron and her circle were interested in this as they hoped that 'some valuable conclusion might be drawn from them as to the function of the brain and nerves [...] Mr. Rutter believed that the body might be compared to a large magnet' (1895: 214). This was a topic close to AAL's heart and although she was very ill, in early August 1851, AAL travelled to Brighton to meet Rutter, with Sir David Brewster and Dr King. Earlier she had disclosed to her mother that she would prefer Faraday rather than Brewster to accompany her as she felt he was 'much more in [her] opinion, the right kind of mind' (Toole 1992: 191). She may have been correct in her judgement, as a publication in 1852 by Dr Léger about the device was dedicated to Brewster. AAL wrote a note to Lady Byron after her visit to Brighton, saying that she had left behind two manuscripts on Rutter (Toole 1992: 394), although whether this was one last venture into scientific review or just something that she was reading, we will never know.

When AAL was very ill, Lady Byron applied ‘Rutter’s principle’ to the north and south poles of her head (Stein 1985: 228–9). It is not recorded whether this helped her condition. Still committed to the idea of Rutter’s work, in June 1852, Lady Byron wrote to a friend about her daughter’s progress: ‘Babbage won’t hear of Rutter *because* Dr. Leger uses his inst[rument]t for Phren[omesmerism]!’¹⁴ [...] I shall go to Faraday today as this Sun gives me strength’ (Stein 1985: 227). Lady Byron may have hoped to convince Faraday of the validity of Rutter’s practices, however Faraday had always believed in the importance of teaching science, saying that ‘in maintaining the fabric of modern society ... technology – not classics – is the pillar supporting modern culture’ (Cantor 1993: 148). Shortly after AAL’s death, in an outspoken attack on table-turning and spiritualism, Faraday went further in a letter to *The Times* dated 30 June 1853, pointing out that ‘without an adequate education in science the public was prey to every charlatan’ (Cantor 1993: 149). In response, Rutter published a paper ‘to defend electrobiology, table-turning and other satellite practices of mesmerism from Faraday’s dismissal’ (Winter 1998: 193).

Despite Faraday’s refusal to adopt her as a student, he remained on friendly terms with AAL and her family until her death. Geoffrey Cantor comments that Faraday, would have given a negative response regardless of his state of health, ‘since he pursued his research in a personal and independent manner’ (1993: 143). AAL reports in a letter to her mother dated June 1851 that he had spoken and written to her ‘in very high terms of Annabella, & also of Ralph [AAL’s children]’. AAL’s daughter, Annabella, wrote to Faraday on 15 June 1851 to thank him for his letter and to say that she has got ‘Harris’s book on electricity [...] it is to you [Faraday] that I owe my desire to become more nearly acquainted with this interesting branch of science’ (Faraday 1999: 309). That same month, Faraday had arranged to spend an evening with AAL (Toole 1992: 189–90).

Babbage was a constant feature at AAL’s house and, in the summer of 1852, had some influence on the physicians that she consulted. Babbage had been increasingly concerned about AAL’s health and called in other doctors to obtain second opinions, but by this time it was too late. Once Lady Byron had moved in to the Lovelaces’ home in August 1852, Babbage was banned from the house. AAL tried to make him her

¹⁴ ‘Recognizing mesmerism as a natural corollary to the understandings of mind and matter hypothesized by phrenologists, moves were made in the early 1840s to formally conflate the two as “phrenomagnetism” or “phrenomesmerism” ’ (Richardson 2013: 91).

executor, passing him a letter during his last visit, but this too was overruled by her mother.

Lady Byron continued to be fascinated by mesmerism, but AAL remained sceptical. Even when she agreed to her mother's pleas to see a mesmerist as AAL's health declined, she did not find that it helped her to control the pain and she rejected mesmerism for laudanum. During the course of her studies on the subject, AAL fluctuated from believing that mesmerism could cure her ill health to claiming that an indirect exposure to the phenomenon in 1841 was, in fact, responsible for her disease. As to her reasons for ultimately rejecting mesmerism, she just required more tangible scientific evidence and believed that the whole practice was too prone to suggestibility. Alternatively, this may have been a means of challenging her mother, whose belief in the treatment and similar therapies was unshakeable, and declaring independence through rational enquiry.

Conclusion

'I do dread that horrible struggle that I fear is in the Byron blood. I don't think we die easy'. So wrote Ada, Countess of Lovelace, a year before her death on 27 November 1852. Florence Nightingale visited the Lovelaces' London house in the days following AAL's death. She wrote a very moving account of a family in turmoil. Lord Lovelace had left to accompany AAL's body on its journey to the Byron ancestral home. AAL's desire to be buried next to her father must have been known to only a very few, as Nightingale writes, '[o]f all the queer things it does seem to me the queerest that they should wish to being her into connection with Lord Byron after her death' (2003: 760–1). This was not a last-minute decision on AAL's part, as she had been in contact with Colonel Wildman, who now owned the Newstead property, two years earlier (Woolley 1999: 262–3).

AAL had said that she was more than a wife and mother and sought to be a 'professional person' (Toole 1992: 225). Openly flouting conventions of the time, she would run around London, take the train, attend public lectures, discuss taboo topics at dinner parties, and think nothing of having private conversations with men, something that was frowned upon at the time and, indeed, caused her to be the subject of gossip. Sarah Grand noted in her groundbreaking article introducing the 'New Woman' that women do not wish to ape men, but a woman should be 'content to develop the good material which she finds in herself' (1894: 270). Sixty years earlier,

AAL had looked to find her own ‘good material’. AAL did not want to ‘ape’ men but sought to introduce a poetic science that allowed her to use imaginative thought to explore and expand the possibilities offered by the discoveries and inventions of the time. Her notes on Babbage’s Analytical Engine, with detailed tables and visionary ideas on technical method and application, would only be truly appreciated a century or more after their publication. AAL was committed to rigorous scientific method and questioned the reliability of human experience and testimony, and it was this that ultimately caused her to reject mesmerism as a therapy.

The role of women in science and mathematics at that time followed strict rules, with their involvement being limited to the interpretation of ideas; activities such as translating or writing books to explain complicated concepts was acceptable, while originating thoughts and carrying out experiments was generally considered unseemly. This became more apparent to both men and women as the growth of the institutions and the role of the career scientist meant that a clear divide formed between the professional and the interested amateur. Daring and questioning though she was, AAL ultimately left many unfulfilled enquiries. Nonetheless, she showed that women were capable of organized and logical thought as well as, through her poetical science, innovative and imaginative ideas.

In a letter to her mother dated Wednesday 3 March 1841, AAL prophetically wrote, ‘in all probability my reign (if ever I have one) over mankind will be chiefly after my death or at any rate a much more extensive one than at any period of my life’ (Toole 1992: 156). AAL’s egalitarian approach to science was at odds with the formal hierarchical, institutional structures of the nineteenth century, but to modern eyes she is representative of the ‘open access’ attitudes that liberal, Western societies seek to promote today, although full gender equality has not yet been achieved. This crucial issue is recognized on Ada Lovelace Day, held every year in the month of October, which represents and encourages the role of women in science, technology, engineering and medicine (STEM). At the same time, AAL has now been elevated to cult status: she appears as a steampunk heroine in *The Difference Engine*, the 1990 novel by William Gibson and Bruce Sterling, and as a pipe-smoking cartoon figure in the graphic novels of Sydney Padua. AAL is as mesmeric in her legacy as she was in her lifetime.

Chapter 3

Santiago Ramón y Cajal: Vision, Hypnosis, and the Power of Suggestion

The work of the physician has always been surrounded by a certain mystique. Through her or his ability to heal, the physician can, to some extent at least, bestow life or death on the sick and infirm and as a result holds a position of esteem and power within society. This is the case even today, as Harry Cayton, the UK Department of Health's National Director for Patients and the Public, notes, 'opinion polls suggest that doctors are among the most trusted people in society' (Royal College of Physicians 2005: 8). Indeed, modern medical practitioners, of conventional medicine at least, are bound by professional standards and codes of ethics, many of these being based on the Hippocratic Oath taken by Ancient Greek physicians, which includes swearing to do no harm and to avoid any voluntary acts of impropriety or corruption (US National Library of Medicine 2012). Nonetheless, the intimate relationship between the physician and patient is a delicate one, offering as it does the potential for the exploitation of the weak by the powerful.¹

The development of modern medicine can be said to have its origins in the Enlightenment of the eighteenth century, a philosophical movement that emphasized rationality, reason, and evidence. This was an age that promoted scientific enquiry and the organization and categorization of knowledge, which led to the introduction of more formalized methods of medical investigation. These methods included mapping the body through dissection and experimentation, the introduction of standards of 'normality' and 'abnormality' obtained from large-scale studies carried out in clinics or hospitals, and the establishment of medicine as a discipline. According to French philosopher Michel Foucault in *The Birth of the Clinic*, written in 1963, this change in approach to medical science resulted in the patient becoming powerless under the gaze of the physician. Foucault's concept of the clinical gaze, as noted by Anne-Marie Barry and Chris Yuill, 'is part of a specific discourse on the body in which the body is perceived as a physical object capable of being observed, measured and treated with

¹ The website of the General Medical Council contains lists of anonymized cases illustrating that, despite the high standards in place, there are still those who are found guilty of bringing the profession into disrepute: www.gmc-uk.org/guidance/21204.asp (accessed 15 June 2015).

little or no reference to the person' (2008: 29). However, the concept of the all-powerful, all-seeing gaze includes within it the potential to exercise control over the mind as well as the body of the patient. An example of this can, to some extent, be seen in the famous Tuesday lessons and Friday demonstrations on hysteria held by the French neurologist Jean-Martin Charcot at the Salpêtrière Hospital in Paris in the latter part of the nineteenth century. The artist André Brouillet captured such a scene in his 1887 painting, *A Clinical Lesson at the Salpêtrière*. Here, female inmates would 'perform' as Charcot hypnotized them in front of an audience of fellow scientists and wealthy patrons, all of whom would be fascinated by the writhing, groaning, and final quelling of the semi-clothed 'Queens of Hysterics'. Simon Shorvon notes that 'like all celebrities Charcot attracted bitter criticism, not so much from the medical profession who themselves were essentially mesmerized by his theories [...], but by novelists such as Tolstoy, Guy de Maupassant, Zola and Huysmans' (Shorvon 2007: 3346). This idea of the dehumanizing effect of institutional treatment as part of the medical profession's quest to bring a deviant body back into the accepted 'norm' has been explored in many ways through the arts, from Gothic monsters brought to life by ruthless researchers to the futile attempts at rebellion by the inmates of a psychiatric hospital. Often, these interpretations are offered by doctors and scientists themselves, using their medical insight to examine the dynamics of science, society, and the individual.

There is a long tradition of physician-writers, from St Luke 'the doctor' (Colossians 4:14, NIV Bible), believed to be the author of the third Gospel and the Acts of the Apostles, to, in our own times, best-selling novelist Khaled Hosseini,² who juxtaposes the abuse of power with the generosity and redemptive qualities of the human spirit. William Carlos Williams, a doctor and poet, described the unique view that physicians have into the world of the individuals who present themselves for healing: 'we begin to see that the underlying meaning of all they want to tell us and have always failed to communicate is the poem, the poem which their lives are being lived to realize' (1967: 362). Perhaps this urge for doctors to express themselves through words is a response to the pressures of balancing the demands of diagnosis and treatment through examination and deduction, with the constant exposure to the pain and passions of their patients. Whatever the case, the writings of physician-writers can provide an understanding of the power dynamics between doctor and patient, and also warn about the potential for

² Hosseini's most significant works include *The Kite Runner* (2003), *A Thousand Splendid Suns* (2007) and *And the Mountains Echoed* (2013).

abuse that may lurk there. In particular, a consideration of hypnotism as a practice not only encompasses human interaction and its effects on the mind and body but also examines the point at which the science of healing meets the art of performance.

This chapter and the following chapter will investigate the relationship between the science and art of two eminent physician-writers of the nineteenth century, Santiago Ramón y Cajal (1852–1934) and Sir Arthur Conan Doyle (1859–1930), in a consideration of how their work sheds light on human power-play in an age of scientific discovery and social change. Both men were medically trained to respect the rigour of empirical research and yet were intrigued by the phenomena of mesmerism and hypnosis that came to prominence when they were young doctors. Their work provides a fascinating insight into the point where deduction and rationality meet the more controversial and subjective aspects of scientific enquiry.

Cajal's artistic laboratory: vision and the power of scientific lyricism

Santiago Ramón y Cajal (1852–1934) is described by Patricia Novillo-Corvalán as ‘one of the most representative figures of the fruitful interaction between medicine and the arts in nineteenth-century Spain’ (2015: 23). Cajal achieved fame and worldwide recognition for his pioneering work in neuroscience, winning the Nobel Prize for medicine in 1906, despite an unpromising start to his studies and living through the turbulence of *fin de siglo* Spain. In addition to his talent as a scientist, Cajal was a gifted artist and a writer of both fiction and non-fiction. Cajal’s writings covered a number of areas outside his main field of research, including an article documenting his investigations into hypnosis and a story that considers the implications of a scientist who undertakes an experiment of mass mesmerism using a whole town as his subject.

In an interview conducted in 1900, Cajal said, ‘[t]here can be no doubt that only artists are attracted to science’ (DeFelipe 2010: Frontispiece). Cajal himself wanted to be an artist, as he says in his autobiography, *Recollections of My Life*, first published in Spanish in 1917, ‘convinced of my artistic ability, [I] believed myself capable of emulating the glories of Titian, Raphael, or Velasquez’ (1989: 107). Cajal’s father had other ideas and wanted him to become a physician. In an effort to curb the unruly behaviour of the young Cajal, whose propensity was to be outdoors with his sketchbook making drawings of the natural world rather than studying in the classroom, Cajal’s father took his son out of school and apprenticed him to a barber, thus ensuring that he had a trade. Cajal writes, ‘[the apprenticeship] placed me in contact with the soul of the

people, [...] it developed in me that feeling of humility and modesty, which is associated with inborn poverty' (107). The love of nature and his social conscience never left him and can be seen in his writing, for example in one of his stories, 'The Natural Man and the Artificial Man', included in the 1905 collection *Vacation Stories* (Cajal 2001), which is full of the wonders of nature and the rewards that their study can bring; the Catholic Church and organized religion, however, are less favourably portrayed.

Cajal did learn to apply himself to his studies and by 1873 was licensed to practise medicine. Indeed, Cajal had impressed his father so much with his anatomical drawings that the latter tried to publish his son's work (Cajal 2001: xi). After serving his national service as a military physician in Cuba during the Spanish colonial war, Cajal returned to medical research and applied himself to passing his doctorate in medicine. During the doctorate examination in cytology, 'he was shown actual preparations under the microscope; he had not seen such before. They keenly excited his interest' (Sherrington 1935: 427) and so began Cajal's involvement with microscopy. Working first in bacteriology, Cajal was seconded to study the cholera pathogens in the epidemic that broke out in 1884. He disagreed with the trial of the immunization programme proposed by the well-known Tortosa physician, Ferrán, as Cajal wished to 'preserve [his] independence of judgement and to remain free of any suspicion of mercenary motives' (Cajal 1989: 286). This proved to be a wise course, for Ferrán immunized 15,000 people with disastrous results: 'Ferrán's method was primitive, the dosage wrong, and his cultures impure' (Altman 1998: 120). In appreciation of his work during the epidemic, Cajal received 'a magnificent Zeiss microscope' (Cajal 1989: 290) from the provincial government of Zaragoza. After this, Cajal decided, despite the economic rewards and possible glory on offer in bacteriology, to choose 'the cell [over] the microbe' for:

I knew well that I could never be able to drive through such a narrow path in a luxurious carriage; but I should feel myself happy in contemplating the captivating spectacle of minute life in my forgotten corner and listening, entranced, to the restless beehive which we all have within us (1989: 291).

This extract from Cajal's autobiography illustrates his poetic style of writing. In her introduction to *Vacation Stories*, Laura Otis talks about the problems of translating Cajal's stories: they are written in 'long convoluted sentences', which Otis shortened to

appeal more to modern readers (Cajal 2001: xix). Cajal's 'humor, high tone, and inspirational insights' remain, though, and his rich and romantic style is as evident in his stories as it is when he is describing what he sees under the microscope. In this example, Cajal is writing of his study of the brain:

My attention was drawn to the flower garden of the grey matter, which contained cells with delicate and elegant forms, the mysterious butterflies of the soul, the beating of whose wings may someday [...] clarify the secret of mental life (1989: 363).

This combination of art, poetry, and medicine enabled Cajal to perceive brain cells through both a rationalist and a poetic lens, an interdisciplinary fluidity that he termed 'scientific lyricism' (1989: 281). Laura Otis notes that Cajal was:

[A] visual thinker, [he] learned best through observation; [...] [o]nce science and medicine became a visual experience, Cajal found himself fascinated by the human body (Cajal 2001: ix).

Cajal believed that observation was an essential quality, a subject he discusses at length in his book *Advice for a Young Investigator* (1897). He quotes the Spanish writer Ramón Pérez de Ayala, who urged others to 'look at things as if for the very first time', adding that:

[T]hat is, admire them afresh [...] We must free our minds of prejudice and fading images, and make a definite point to see and judge for ourselves (Cajal 1999: 111–12).

This was not just a 'do as I say, not as I do' empty statement; rather, this concept underpinned Cajal's approach to scientific study. The issue of education was dear to Cajal and he returned to it frequently.

Laura Otis quotes the French philosopher Henri Bergson, who said ‘Cajal first saw the truth, then confirmed it experimentally’ (Cajal 2001: xiv). As well as referring to Cajal literally seeing through the microscope and his close visual scrutiny of his subjects, this suggests the vision that Cajal possessed to see things differently. By considering ideas, such as form as a cause of function (Pratt 2006: 260), he was able to come up with innovative ways of explaining how things might work. One of the many legacies of Cajal’s work that also serves as an unintentional testament to his powers of seeing is that the group of cells in the midbrain responsible for holding vertical gaze still carries his name: the interstitial nucleus of Cajal (Mai and Paxinos 2012: 340).

Just as his fictional characters were inspired by the spirit of science, Cajal’s popular articles, where he adopted the pseudonym ‘Doctor Bacteria’, were his ‘attempt to enhance the cultural status of science in Spain’ (Pratt 2006: 108). By trying to engage the interest of his readers, particularly potential ‘young investigators’, Cajal sought to bring the exciting world of science to those outside the exclusive enclaves of the institutions, helping to explain to the population at large some of the modern ideas and developments that were taking place. Pratt also comments on the metaphor of Cajal’s language in these articles, for example: ‘the neuron has giant arms that later become tentacles (the image smacks of imperialistic language related to the Spanish colonies)’ (108). These words could carry the suggestion of political comment but as they are being written from the point of view of ‘Doctor Bacteria’, who is ‘sufficiently small and humanlike that such comparisons seem natural’ (109), they appear perhaps more benign than they really are.

Juan Lerma and Juan De Carlos (2014) consider the position of scientific research in Spain during the time of Cajal, suggesting that it was Cajal’s recognition abroad after he received the Moscow Prize in 1900 that led to his acknowledgement by the Spanish government, who then promoted him and provided a laboratory and an endowment to go with it. Caudill describes Cajal as ‘more of an ambassador than a critic of the scientific establishment, though he was critical of ethically irresponsible science’ (2011: 40), a subject that he explored in his fiction.

Cajal’s engagement with the social questions of the day is evident in that he was asked to write the Preface for Enrique Lluria’s *Super-organic Evolution: Nature and the Social Problem* (1910). Cajal is modest, however, describing himself as:

A worker bee of the great human hive, I have confined myself chiefly to gathering honey in the garden of Nature, in order to build my small individual cell, leaving others, with the eagle's vision and powers of concentration, to trace the perspective and found the philosophy of a common labour, marking the future routes of the human swarm (1910: vii).

Cajal's considerable observation skills, honed both by his studies of cellular matter through the microscope and by his detailed reproduction of what he saw, must have contributed to his interest in the science of psychology. Cajal's personality, with his drive to see, study, and understand, would at times seem to border on the obsessive. An example of this obsessive nature can be seen in his near addiction to the game of chess. Having accepted an invitation to join the *Casino Militar* in Barcelona, Cajal notes that 'I reached the point of playing four games simultaneously [...]. In my desire to shine at all costs and my confidence in my rather good visual memory, I even played without looking at the board' (Cajal 1989: 326–7). However, this 'vice' was taking its toll on him; he was dreaming about the game, having nightmares about missing moves, and his concentration was failing. To combat this, Cajal devoted himself for a period of time exclusively to the game, adopting the '*similia similibus* of the homeopaths' (1989: 328) until he was able to defeat all his competitors. Honour satisfied, Cajal then 'abandoned [his] place at the casino and did not move a pawn again for more than twenty-five years' (328), although Richard Rapport notes that a photograph taken only ten years later shows him once more playing chess (2005: 26; 99).

Cajal's scientific study of hypnosis

Cajal said in his autobiography that during his time in Valencia (1884–7), he 'developed two kinds of amusement; picture-taking excursions and the experimental study of hypnosis, a budding science which at that time was attracting the curiosity of and inspiring a passionate interest in the minds of the public' (1989: 311). It is perhaps hardly surprising that Cajal would focus on these 'amusements', as both would involve the concept of seeing, a recurrent theme throughout his life, whether it was through a camera lens or a microscope, or by observing the behaviour of people.

José Sala et al. summarize the early work on hypnosis in Spain, suggesting that it was only in the second half of the nineteenth century, with the work of Braid in England, James in the USA, and Charcot and Bernheim in France, that interest developed in the

country (Sala et al. 2008: 361). Hypnosis was a subject that divided opinion at the time, such that in 1887, Abdón Sánchez Herrero, Professor of Therapeutics at the University of Valladolid and a man described by Ryan A. Davis as ‘Spain’s foremost exponent of hypnotism’ (2012: 2), prefaced his famous book on hypnosis and suggestion with a plea to the official Spanish health authority for protection against ‘the slander against me that has been and is still being carried out’ (Sala et al. 2008: 362).

While in Valencia, Cajal set up a ‘Committee for Psychological Investigation’ in his house. The patients included lawyers and physicians, although in his autobiography he only mentions those who were ‘healthy and apparently free from any neurotic taint’ (Cajal 2001: 313). Cajal seemed less willing to deal with the ‘[c]rowds of unbalanced people, and even those completely mad who flocked to consult [him]’ (2001: 314) once the success of his clinic became known, and ‘having satisfied [his] curiosity, [he] dismissed [his] patients (2001: 314). As José Sala et al. note, ‘although he did not contribute new techniques or theories to hypnosis, he can be seen as an international pioneer in the use of hypnoanalgesia’ (2008: 366). Cajal comments that the results of his experiments concerning hypnosis caused him:

[M]ingled sentiments of surprise and disillusionment: surprise at recognizing the reality of phenomena of cerebral automatism deemed thitherto tricks and deceptions of circus magicians; and sad disillusionment by the consideration that the human brain [...] suffers from the enormous defect of suggestibility (2001: 315).

Cajal’s unsettling realization of the effectiveness of ‘suggestibility’ prompted his more serious investigations into hypnoanalgesia. As part of his investigations, Cajal hypnotized his wife, Silveria Fañanás García, who had a history of difficult and painful childbirth. She welcomed the use of hypnosis for the delivery of her sixth child, after she had been reassured that the method would not jeopardize her health or that of the baby. In ‘Pains of labour’, Cajal mentions that she had previously been the subject of numerous hypnotic experiments and that ‘she underwent vigil suggestion [i.e. while awake] with great ease’ (2007: 355). He then reports that ‘ten days prior to the birth, she underwent hypnosis and it was suggested to her that labour was evolving rapidly, the contractions of the uterus were strong and frequent and in contrast to what ordinarily happens the pain was minimal and tolerable’ (355). By pretesting his method, Cajal ensured that during childbirth his wife achieved a similar state of anaesthesia and

suggestibility, without losing consciousness, which alleviated the pain of the contractions and the dilation of the cervix (Lanfranco et al. 2014: 2). Cajal then adds that ‘upon the termination of the labour, the patient shifted on the bed, unable to mask her happiness for being freed, at such little cost, from a long-feared painful moment’ (Cajal 2007: 355).

It is not difficult to see that for Cajal this experiment into hypnoanalgesia was a success. And yet the outcome of the hypnotic case study is radically undermined by Cajal’s tentative conclusion, where he admits that ‘we have been unable to reach a definite conclusion to this day’ and that ‘it will take more concomitant evidence to establish an aetiological relationship between these two phenomena’ (2007: 356). This hesitant tone is a far cry from the unequivocal microscopic evidence of his neurological investigations, showing a more cautious Cajal whose reservations contrast with the firmly established scientific rigour of his histological studies. For the ‘empiricist’ Cajal, moreover, the hypnotic method required further experimentation and quantifiable evidence which he was unable to provide. In this sense, Cajal’s medical restraint shows that he did not want to tarnish his scientific name as a histologist by forging himself a reputation as a hypnotic dilettante or, at worst, an impostor in a field widely associated with charlatanry. Nonetheless, the results were documented in an article, which was published in the journal *Gaceta Médica Catalana* in 1889. While this journal was fairly limited in its circulation, being a regional publication, the article did achieve a mention, albeit an anonymous one, in the *British Medical Journal*.³ The year that Cajal published his study of hypnosis and childbirth is significant as it was also the year that Charcot hosted the First International Congress for Experimental and Therapeutic Hypnotism in Paris, and so perhaps he had less cause for concern about its reception than Herrero had two years earlier.

Cajal’s literary critique of hypnosis

At the same time as Cajal became interested in hypnosis, he also wrote *Vacation Stories*, although the stories were not published until 1905, almost twenty years after they were written and one year before he was awarded the Nobel Prize for Medicine, a

³ According to Jacobson, ‘Cajal’s habit was to publish rapidly in a local journal to establish priority [of discovery], and to send the same results to a foreign journal to be published about a year later’ (1995: 244), so that he could disseminate his work internationally. Cajal also founded his own journal in 1888, *Revista trimestral de Histología normal y patológica* (244), enabling him to control the communication of his findings.

coincidence of dates that is far from accidental. In his foreword to the collection, he explains that the stories were in fact written in 1885–6, at a time when his emerging medical career was not yet firmly established, thus partly justifying his decision to postpone their publication. A flippant Cajal, however, dismissively labelled the tales as ‘pseudo-scientific narratives’ (the full title of the book is *Cuentos de vacaciones: Narraciones pseudocientíficas*), and believed that the amateurish stories might have put at risk his nascent scientific reputation, thus relegating the collection to two decades of virtual oblivion (Novillo-Corvalán 2015: 28). D.J. O’Connor explains that the belated publication of *Vacation Stories* was due to Cajal’s concern that ‘these “anti-religious, anti-establishment”’ tales might threaten his scientific funding, thus explaining his decision not to publish them until his scientific career was properly established (O’Connor 1985: 100; see also Otis’s ‘Introduction’ to Cajal 2001: vii–viii). Indeed, Cajal feared that the five tales included in *Vacation Stories* could compromise his scientific reputation, not least because they were a collection of seemingly ‘subversive’ science fiction tales that openly undermined the deeply rooted religious beliefs and local superstitions of Spanish society, through their empiricism, secularism, and application of scientific methods. Moreover, in delaying the publication of the ‘Doctor Bacteria’ stories, Cajal the ‘scientist’ is displaying the same type of reticence he had shown towards his hypnotic activities. What Cajal previously labelled as just mere ‘amusements’ (i.e. photography and hypnotism) can be easily extended to his aesthetic drive, which he self-effacingly called a ‘literary mania’ (Novillo-Corvalán 2015: 24). But, as shown earlier, this labelling is deceptive and contradictory, since the demarcation between Cajal’s different pursuits was not as rigid as he claimed. The stories, in effect, are closely linked to Cajal’s microscopic and hypnotic investigations, illustrating the interplay between literature, art, and science through his endeavour to test the ethical implications of his scientific discoveries within the relatively ‘safe’ confines of fiction. This fits well with Reginald Bretnor’s definition of science fiction as ‘fiction based on rational speculation regarding the human experience of science and its resultant technologies’ (Stableford 2004: xxxiii–iv). For Cajal, then, the science fiction tales allowed him the possibility to test *risqué* scientific ideas and to apply them to literary characters, with all their frailties and passions.

The titles of the fictional stories illustrate an attempt to speculate with a variety of moral conundrums that would have preoccupied Cajal throughout his career as a

scientist. For example, at first glance the title ‘The Fabricator of Honor’ sounds rather stilted, old fashioned, and moralistic. Yet this title is not intended to be serious, but rather a playful engagement with one of the most significant themes of Spanish Golden Age theatre: the code of honour. Thus, ‘The Fabricator of Honor’ is a humorous reworking of well-known titles such as *El medico de su honra* (*The Surgeon of his Honour*, 1631), a tragedy by Pedro Calderón de la Barca. However, the similarities end here, as Cajal is preoccupied in dramatizing the conflict between science, morality, and hypnosis, as opposed to the tension between family, honour, and revenge that is established in Calderón’s play.⁴ Thus, the concept of ‘honour’ is perceived through the lens of the scientific and moralistic dilemmas it raises. Dale Pratt, in this respect, considers that in Cajal’s stories ‘[the] characters resolve their problems according to their own gods (the ideals of progressive science)’ (2006: 82).

‘The Fabricator of Honor’ concerns a distinguished physician named Dr Alejandro Mirahonda, ‘a favourite disciple of those learned doctors of hypnotism’ (Cajal 2001: 38), who decides to test the effects of his moral vaccine in the small town of Villabronca, a city where ‘[f]rom day to day, the disorder and lewdness spread, especially now that [it] had become primarily industrial’ (42). It is worth paying attention to the negative connotations of the compound word ‘Villabronca’, a playful coinage that brings together the word ‘villa’ (town) with the adjective ‘bronca’, meaning in peninsular Spanish ‘row’, ‘trouble’, and ‘disruption’. Cajal is equally tongue-in-cheek in naming the hypnotist Mirahonda, ‘mira’ (look) and ‘honda’ (deep), which is an allusion to, or even a parody of, the trademark physical feature of the mesmerist: magnetic and entrancing eyes. Laura Otis aptly translates it as ‘either Deep Look or Looks Deep’ (Cajal 2001: 75), while the critic O’Connor remarks that Cajal is, indeed, very fond of using ‘preposterous names’ (1985: 118). Cajal is evidently satirizing the clichéd perceptions of the hypnotist as a figure of both admiration and ridicule, a mark that is extended to the entire physical description of this charismatic personage that instantly conjures up the portrait of the mesmeric magnetizer:

⁴ It should be noted, however, that Cajal’s story ‘For a Secret Offense, Secret Revenge’ uses the plotline of Calderon’s tragedy. See Otis, ‘Introduction’ (2001: xvi). In addition, ‘Cajal openly acknowledged his debt to Cervantes’ (xvi). ‘The Fabricator of Honor’ recalls Cervantes’ farce *The Marvellous Puppet Show* (*El retablo de Maravillas*), where two tricksters arrive in a small town and claim that the miracles that they perform on a table can only be seen by ‘Christians of legitimate birth’; naturally, no one owns up to not being able to see them. As Otis says, this would appeal to Cajal as he ‘fought social suggestion that altered people’s vision of reality’ (xvi).

He had the tempestuous beard of an angry apostle, and his enormous, deep, black eyes with an irresistible, searching gaze had pupils that seemed to emit clouds of magnetic effluvia. His eyebrows were long, thick, mobile, and serpentine, apparently endowed with a life of their own. [...] Besides this, he had a very substantial voice famous for its roars, but he knew just how to manage it, transforming it, according to the situation, into the gentlest, sweetest, and most caressing music (2001: 39).

This description is reminiscent of Franz Mesmer (1734–1815), the founder of the theory of ‘animal magnetism’, who was renowned for his enthralling eyes and suggestive voice (Wyckoff 1975: 124).

For Doctor Mirahonda:

All the wonderful miracles attributed to saints and magnetizers were [...] a mere game. To enact them, all he needed was one impetuous look or a simple verbal command (Cajal 2001: 40).

So he provides an elixir that will force the citizens to lead a moral life and, even though it is plain water, this achieves the desired effect. As everyone behaves, so trade falls and people become dissatisfied with their well-behaved life. Doctor Mirahonda then provides an antidote, more water, and they go back to their old ways, leaving the doctor to publish his paper, which concludes ‘the possibility of reeducating people by means of suggestion is a firmly established fact’ (65).

Mirahonda’s performance of the inoculation of the citizens is accompanied by all the trappings of ritual and ceremony recorded in accounts of Mesmer’s salons in eighteenth-century France. The event takes place in the town hall in the presence of the local dignitaries. A splendid lunch is laid on and there is a brass band playing grave and solemn music; not quite as celestial as Mesmer’s glass harmonica but still marking the event as something special.

Mirahonda demonstrates the efficacy of his experiment by parading the reformed drinker, smoker, gambler, and brawler, and providing supporting testimonies from their factory foreman, for Mirahonda knows that ‘strong minds are not persuaded by more or less truthful tales but only by irrefutable proof *de visu*, which cannot fail to be accepted’ (44). Again, Cajal returns to the effect of the visual, the proof being in the seeing, although, of course, appearances can be deceptive.

Another interesting aspect of ‘The Fabricator of Honor’ is the consideration of physiognomy (39), the assessment of someone’s character by the way that they look, a pseudoscience popular in the nineteenth century. Doctor Mirahonda, who appears to possess the correct countenance for his position, dupes the citizens of Villabronca and embodies the dangers of taking people at face value. ‘The Fabricator of Honor’ also notes, in a nod to Darwin, that:

[T]he commandment of Nature, who, ever attentive to her primordial evolutionary ends [...] prefers tyrannical organization to liberating anarchy; conservative, invigorating cruelty to indulgent, relaxing, mercy (68).

This story echoes many of the ideas that were percolating around Europe at the time, for example the degeneration theories of Bénédict Morel and Cesare Lombroso. Morel published his *Treatise on Degeneration* in 1857, two years before Darwin’s *On the Origin of Species*, and as Laura Otis notes, ‘used earlier theories of evolution to construct a new pessimistic hypothesis’ (1994: 49), whereby the combined effects on individuals of negative inherited traits and an unhealthy environment resulted in a sad end, such as mental illness or premature death. Some twenty years later, in 1876, Lombroso published his most famous work, *The Criminal Man*. Here, Lombroso developed the ‘notions of degeneracy and atavism so far as to propose that criminals be studied as a separate race’ (Otis 1994: 50), developing a database of the physical characteristics of those who were born criminals. While Morel offered the hope that better social conditions could change the fate of the unfortunate individuals, Lombroso’s view was less positive as he felt that there would always be those with innate criminal tendencies.

Cajal was a very outward-looking scientist, involving himself in the community outside Spain, and so would have been aware of the debates surrounding inheritance and degeneration that circulated during the latter half of the nineteenth century, and therefore ‘The Fabricator of Honor’ takes a satirical look at such ideas and would seem to negate them. David Caudill notes that the short stories of Cajal ‘not only reveal the ethical, rhetorical, and reputational (or public relations) aspects of the scientific enterprise but frequently contrast law and lawyers with science and scientists’ (2011: 6). More ominously, as observed by D.J. O’Connor, ‘Cajal clearly saw the implications of suggestion as applied to a whole population’ (1985: 115). O’Connor goes on to quote Joaquin Iriarte, who saw ‘The Fabricator of Honor’ as ‘an insight into the origin of evil’

(1985: 115), a statement that suggests that the tale foreshadows the dark events that were to take place in the twentieth century.

Around the same time that Cajal published his *Vacation Stories*, another Spanish writer, Blanca de los Ríos, published two stories on the dangers of hypnosis, ‘Metempsychosis: De las “memorias” del doctor Hipnos’ [‘Metempsychosis: From the “memories” of Dr. Hipnos’] (1906) and ‘Las Hijas de Don Juan’ [‘The daughters of Don Juan’] (1907). As discussed by Ryan Davis (2012), these stories serve as a warning of the vulnerability of women to the power of suggestion, particularly by men, and that education is necessary in order to avoid the dangers of ‘donjuanism’.⁵

In contrast to de los Ríos, the women in Cajal’s stories are often shown to be colourful and vivacious, as well as demure and virtuous. In ‘The Fabricator of Honor’, not only are many of the women portrayed as debauched hussies in danger of tempting the scientist to stray from his ‘principle that the *fascinator* must never himself be *fascinated*’ (2001: 41), but they give themselves over to complete abandon at the end of the story:

[In] their thirst for sin, [the women] including the registrar’s wife, the syndic’s wife, and many other distinguished women of leisure ignored the recommended dose [of the *liqueur of evil*], emptying not just cups but entire pitchers (63).

There are those who are more acquiescent, such as Mirahonda’s beautiful and rich German wife, ‘subjugated forever with a single look’ (40), although Röschen’s dotting and submissive attitude is quite hard to believe and raises the question as to whether she has in fact been hypnotized herself.

The quote from Madame Necker de Saussure offers an explanation for the attitude adopted by the women of the town towards ‘such a proud, virile specimen of the *human animal* [that] aroused and enchanted them’, for ‘woman “possesses a *self-concept* weaker than a man’s”, a self that senses its own feebleness and seeks the force of willpower and strength’ (Cajal 2001: 40). The sentiments expressed here, while possibly meant tongue-in-cheek, nonetheless imply that women actively seek subjugation and are full of admiration for the ‘*man’s man*’. This could, of course, just be an example of animal magnetism in a Darwinian sense, and that the attraction of an

⁵ The legend of Don Juan first appeared in a work by Spanish dramatist Tirso de Molina around 1630. The character has reappeared in many forms, including an opera by Mozart, a play by Molière, and a poem by Lord Byron. The theme of the evil charlatan–seducer with its stone ghost and eternal damnation is one that continues to fascinate.

alpha male with good genes is sufficient for the good ladies of Villabronca to forget themselves.

Nonetheless, Cajal does not just single out women to be the victims of suggestion; the men too are taken in by the experiment, ‘transfigured as though a flash of faith had illuminated and uplifted their souls!’ (2001: 44). The use of language more often applied to a religion to describe the result of a scientific experiment based on deception enhances the irony of the tale and builds on the earlier descriptions of Mirahonda as ‘prophet’ or ‘Byzantine Christ’ (39). Indeed, ‘the townspeople called him the Christ’ (42), a title given to Mirahonda based on his ‘knowledge and appearance’ (42), and perhaps echoes the privileged position of power that people afford to the healer, even if the healing takes place only in their own minds.

‘The Fabricator of Honor’ deals with one man’s ability not only to exert power over an individual, ‘[f]or him, to impose ideas or to suppress existing ones in docile minds was child’s play’ (Cajal 2001: 40), but also to extend control across the masses in his desire to ‘realize an ethical purification of the human race’ (44). Here, Cajal is warning of the sinister potential of hypnosis and recalls something from his own practice, the view that these effects were produced ‘not just in hysterical people but even in sane, alert individuals’ (40).

The hyperbolic and hubristic tone of Mirahonda’s dubious practice sets a stark contrast to the excessive caution and medical restraint shown by Cajal in his hypnotic case study. These antithetical attitudes demonstrate that the fictional story allowed Cajal to speculate freely about the possible dangers of hypnotic suggestion. This makes evident, once again, the interdependence between Cajal ‘the scientist’ and Cajal ‘the storyteller’ to show that the case study and the fictional story are two sides of the same coin. In the latter, Cajal brings an imaginative, yet realistic, view to the controversial subject of hypnosis, a practice that could potentially alleviate suffering but could also lead to the exploitation of vulnerable people, or at least those individuals more open to suggestion. At a didactic level, then, the science fiction story is constructed as a type of dystopia or cautionary tale.

Don Quixote of the microscope: Cajal’s legacy

By looking at the medical applications of hypnosis and by attempting to map the concepts of consciousness to the physiological workings of the brain, Cajal tried to offer scientific explanations for the mysterious elements of the phenomena displayed. His

belief that the more a patient was exposed to the experience of hypnosis, the faster and more effective were the results, is related to his ideas of neuroplasticity and learned behaviour. However, Cajal was not blind to the abuses of the hypnotic technique, or to the ruthless streak that scientists in positions of power might display in order to enhance their reputations, exploring through his fiction what happens when the boundaries blur. This shows, once again, that the subject of hypnotism was not just a mere ‘amusement’ in Cajal’s industrious career, but rather an ongoing interest that informed his scientific and literary writings and that allowed him to expose the benefits and the dangers of hypnotic suggestion.

Just as much as his research, his artwork and his stories, it was Cajal’s ability to look and see things differently that really made him stand out as a scientist and as a man. The British neurophysiologist Charles Scott Sherrington, in the obituary that he wrote for Cajal, says ‘[t]he orthodox teaching at the time was that and had been for many years, that the grey matter [of the brain] is a network of minute anastomosing nerve-fibres’ (1935: 430). Sherrington goes on to say that Cajal:

[H]ad reshaped our knowledge of the cellular architecture of the nervous system. [...] This conception launched and established [...] that the nervous system is built of conductive chains of individually and discrete conducting nerve cells is sometimes called the neurone-theory (433).

Cajal’s great ability was to be able to understand function by looking at the form of a biological system and so, at a time when this had not been proven by experimentation, Cajal drew arrows on diagrams of the cellular architecture of the nerves to illustrate the direction of electrical current flow. As Jacobson notes, ‘this is the microcosm represented by the railway system or the telegraph system’ (1995: 260) and led to another of Cajal’s major discoveries, ‘the so-called Law of Dynamic Polarization’ (De Carlos and Borrell 2007: 8), that is the conduction by nerve cells of electrical signals. The idea of an electrical current flowing from cell to cell relates to the notion of magnetism, providing a commonality with all systems, whether in the electropolarity of a unicellular organism, the telluric current of our planet, or the energy that drives our industry and lights our cities and houses.

Benjamin Ehrlich has recently published excerpts from his translation of Cajal's *Charlas de café [Café Chats]*, the title of the edition published in 1921,⁶ and one of these particularly seems to embrace Cajal's approach to thinking:

Nature has endowed us with a limited number of brain cells. This, then, is the capital, great or small, that no one can increase, because the neuron is incapable of multiplying itself. Fortunately, however, as compensation we have been granted the limitless privilege of being able to shape, stretch, and entangle their extensions, like cognitive telegraph lines, forming nearly infinite connections between reflective associations and intellectual creations. ... And there is nothing more worthless and even dangerous than a rigid mind, incapable of learning and correcting itself (2012: 181).

The mystery of how our consciousness can affect the physiological workings of our bodies still remains, although ideas such as neuroplasticity, considered by Cajal over 120 years ago, are beginning to shed light on this subject.

Neuroplasticity is a concept that recurs not only in Cajal's work, but also in his approach to life. In *Recollections of My Life*, Cajal says that his time in Valencia was not devoted entirely to:

[H]ard work and feverish labour in the laboratory [...] The artistic and philosophic furrows of my brain were also employed. It was necessary to allot to each cell its rations and to each reasonable instinct a convenient opportunity for exercise. In the guise of relaxing agents for neurons in danger of hardening from disuse, I developed two kinds of amusement (1989: 310–11).

Another of Cajal's *Charlas de café [Café Chats]* seems to embrace the idea of neuroplasticity:

Thanks to the hyper-intensive power of the mind, we are all capable of weaving some of our cortical threads. Without even realizing it, we bend and shape the extensions of our neurons, lacing and interlacing them into

⁶ This first edition, titled *Chácharas de café [Café Chitchats]*, was published in 1920, when Cajal's favourite *tertulia*, the Café Suizo, was demolished. Benjamin Ehrlich in his Translator's note describes this as 'a partly serious, partly humorous booklet of aphorisms and meditations reconstructed from his past *tertulia* conversations' (2012: 168). The 1921 edition was retitled *Charlas de café [Café Chats]*.

infinite patterns, and we spur them on to connect with cells in faraway cerebral territories (2012: 180).

Current research is considering the links between hypnosis and neuroplasticity, and how hypnotic suggestion can be used to strengthen the neural pathways in those suffering from conditions such as stroke or dementia (Doidge 2015).

Cajal comments that it is in the nature of the adolescent to see ‘the world through a magnifying glass, everything appears to him enlarged and with a rainbow halo; in contrast to old age, which seems to see things through a concave lens, that reduces and debases everything’ (1989: 104). However, Cajal retains his youthful view of things, as Pratt comments, ‘They [Cajal and Sherrington] show that the best scientists never grow up—it requires a certain childlike capacity for an adult to continue a vigorous life of the imagination’ (2006: 236).

Later in his life, rather like his British contemporary physician-writer Sir Arthur Conan Doyle, Cajal ‘abandoned his neurobiological research in order to focus on the study of dreams and spiritualism; he even hired an alleged medium from Zaragoza to carry out experiments’ (Lanfranco et al. 2014). Although Cajal recognized that the medium was, in fact, a fraud, he nevertheless ‘maintained the belief that hypnosis may connect mind and matter, thus forming a method capable of producing profound neurobiological changes’ (Lanfranco et al. 2014). Nevertheless, Cajal collected his research data into a manuscript, *Ensayos sobre el hipnotismo, el espiritismo y la metafísica* [*Essays on hypnotism, spiritualism and metaphysics*], completed shortly before he died, but this was then lost in the Spanish Civil War.

Some of Cajal’s work on dreams is recorded in his 1908 paper *Las teorías sobre el ensueño* [*Theories about dreams*] and also in the many contributions he made in terms of prefaces and introductions to a number of subsequent publications (Stefanidou et al. 2007: 358). Bergson referenced Cajal’s ‘ameboid theory of sleep’ in defending his notion of sleep and the relaxation of the nervous system (Kroger 2007: 138). Maria Stefanidou et al. also note how Cajal closely followed the works of Freud, observing that while ‘their views on mental life and on the analysis of dreams differed, they shared similar views on the plasticity of the human brain’ (2007: 359). More recently, Benjamin Ehrlich published a work featuring an English translation of Cajal’s dream diary, a work previously thought to be lost (2016).

Along with contemporaries such as Sigmund Freud, Cajal had a lasting effect on modern science as well as raising the profile of Spanish research both at home and abroad. A much-travelled man, Cajal developed an international presence that brought his work to the attention of the world, even achieving recognition among the artistic fraternity. For example, Edvard Munch's 1900 portrait of his insane sister depicts a table covered in a design from the sketchbook of Cajal showing 'a sagittal section of cerebral nerve tissue viewed in tight perspective and painted in the colors of histological stain' (Everdell 1997: 114). Even now, Cajal still fascinates us, as witnessed by the play *Soldier of the Mind* that was based on Cajal's life and first performed in February 2013 at the Ensemble Studio in New York City. Mary Beth Aberlin, editor-in-chief of *The Scientist*, who had attended a reading of the play a year earlier, interviewed the playwright Justin Fleming and asked what had inspired him to write about Cajal. Fleming said, '[t]o a playwright, this story was a gift—art, science, father and son at the center of a dramatic conflict' (Aberlin 2012). Certainly, Cajal's life was one of adventure, and he deserves the title that Harley Williams gave to the book that he wrote about him, *Don Quixote of the Microscope* (1954), for Cajal was an 'ingenious gentleman'.

Chapter 4

Arthur Conan Doyle and the Interplay between Science and the Imagination

Introduction

While Arthur Conan Doyle¹ (1859–1930) is remembered first and foremost as a writer rather than a scientist, his medical training and experience as a practising physician provided a rich source of material, as well as a diagnostic framework that would prove invaluable in constructing his detective stories. Pierre Nordon described Conan Doyle as ‘a deeply involved observer of his own time’ (1967: 148), but Conan Doyle was not someone who would merely watch from the sidelines, he was also an enthusiastic participant in the popular events and pastimes that were essential to the expanding middle classes of late Victorian Britain. As well as sporting and cultural activities, he made sure that he was involved in the philosophical and spiritual debates that were raging in the later part of the nineteenth and early twentieth centuries.

In an age of unprecedented literacy, increased leisure time and long rail journeys, the demand for entertaining reading material grew enormously. This gave Conan Doyle an outlet for his creative talents and, as his stories sold, a much-needed additional income stream. However, there was more to Conan Doyle’s work than just a good yarn and, in this chapter, I posit that his stories offer a profound insight into not only the changing social and technical world of late Victorian Britain but also the emerging subject of psychology, as many of his stories examine the ‘darker’ aspects of the mind and suggest that Conan Doyle was using Gothic motifs well before the publication of *The Hound of the Baskervilles* in 1902. Senf notes that ‘the second generation of Gothic writers (Mary Shelley and Polidori, for example) [were] interested in exploring the psychology – often the abnormal psychology – of characters who appear perfectly ordinary’ (1988: 24). By harking back to these earlier works, Conan Doyle built on the Gothic tradition of writers such as the physician-writer John Polidori (1795–1821), whose medical writing on the workings of the brain found its way into his fiction as he considered issues such as human autonomy, the imagination and suggestion.

¹ Conan was the name of Arthur Conan Doyle’s great-uncle and godfather, Michael Conan, and while originally given as an additional forename, was included by Arthur Conan Doyle as part of his surname. In this chapter, he will be referred to as Conan Doyle.

In addition to writing in medical journals, such as the *British Medical Journal* and *The Lancet*, Conan Doyle was able to bridge the growing divide between science and literature by publishing articles in newspapers and periodicals. His contributions often chronicled the new ideas, discoveries and inventions that would propel the Victorian world towards modernity, as in the thirteen articles that he published in the *British Journal of Photography* during the 1880s, the *Good Words* article published on ‘Life and Death in the Blood’ in 1883 and *The Review of Reviews* report, ‘Doctor Koch and his Cure’, into the tuberculosis treatment announced in Berlin in 1890. As an ambitious man without the funds or social connections for advancement, Conan Doyle’s writing enabled him to raise both his financial and public profile (Kerr 2013: 62). Writing for the popular press also provided a way for Conan Doyle to pursue his commitment to social justice, something that was evident from early in his career and continued as his public profile grew. In fact, David Canter and Donna Youngs note that Conan Doyle contributed to at least twenty-eight actual police investigations (2009: 53).

A number of recent studies have re-examined Conan Doyle’s work. Lawrence Frank (2009) and James O’Brien (2013) focus on the science in Conan Doyle’s Sherlock Holmes stories and, in particular, the use of forensic techniques. Maria Konnikova (2013) positions Holmes as a master of mindfulness, from whom the reader can learn much about the benefits of meditation when confronted with a challenging problem. Terry Thompson considers the environmentalist side of Conan Doyle’s work, taking his Professor Challenger novels as ‘an understated metaphor for humanity’s hubristic desire to subjugate nature, to redesign it and subsume its elemental powers’ (2015: 180). Critics such as Joshua Wade, Laura Habbe, Laura Otis, Merrick Burrow, Bernard Lightman, David Beck and Douglas Kerr comment on Conan Doyle’s desire to go beyond the pure material. Wade (2015) considers, particularly in his later Holmes stories, that Conan Doyle is moving ‘towards a new emphasis on exploring the psychological motivations behind character actions’ (2015: 82), although it could be said that these preoccupations have always underpinned his stories, as, for example, ‘John Barrington Cowles’ examined masculine insecurity in 1886, albeit from a different perspective to ‘The Creeping Man’ some thirty-five years later in 1923. Habbe considers that stories, such as *The Parasite*, present ‘a surprisingly early critical view of materialism in science’ (2015: 62) while Burrow argues that when Conan Doyle wrote ‘The Final Solution’, a story published in 1894, where Sherlock Holmes appears to

meet his end at the Reichenbach Falls, he had reached ‘a phase of intellectual transition from the confident materialism of his youth towards a deepening fascination with apparent manifestations of the immaterial’ (2013: 309). Bernard Lightman agrees with Burrow and considers ‘the scientific naturalism that originally inspired the creation of the character [of Holmes] became increasingly at odds with Conan Doyle’s fascination with spiritualism’ (2014: 32). David Beck, however, considers ‘Conan Doyle’s wider argument that science should remain open to the possibility that a phenomenon such as spiritualism could be explained by rational inquiry’ (2015: 203) and that ‘Conan Doyle’s emphasis in “The Adventure of the Devil’s Foot,” [a Holmes story first published in 1910] as well as his wider literary output, is on scientific exploration and not mysticism’ (2013: 68). While I would agree with Beck, it should be noted that from his earliest publications, Conan Doyle’s work has always explored the boundaries of science and none more so than his mesmeric stories.

This chapter considers Conan Doyle and his writing in relation to the power dynamics in a society where an individual’s relationship with the self was under question in an ever-more complex external world. As Laura Otis notes in her exploration of germ theory at the end of the nineteenth century, Conan Doyle was concerned with ‘infiltration on both social and psychological levels’ (1999: 6). In common with other physician-authors of the time, Conan Doyle believed that the mind ‘must protect itself by developing a strong “will” to screen dangerous impulses from within and dangerous suggestions from without’ (Otis 1999: 6). Conan Doyle’s tales attempted to unravel the evolving and increasingly porous worlds of science, medicine, and the supernatural at a time when the popularity of the ghost story was at its height, a genre linking back to the Gothic and fantastic tradition of the Romantics, and which, as María del Pilar Blanco and Esther Peeren argue:

Intersected with the effort to unlock other worlds and dimensions—material, psychic, and supernatural—that characterized both spiritualism, in its entanglement with new religious movements, the emergent discipline of psychology, and the professionalization of science in general, and the invention of penetrating yet intangible new media such as telegraphy, photography, and cinema (2013: 2–3).

Conan Doyle’s stories continued the debate into reason and imagination that entered the public domain with the publication of the French Royal Commissioners’ report into

animal magnetism in 1784 and continued to evolve as the nineteenth century progressed. This reflected his own duality as both an enquiring scientist and a creative artist.

The success of the Sherlock Holmes stories outshone any of Conan Doyle's other works, much to his chagrin. This was partly owed to an identifiable Victorian appetite for sensational press reports of scandals and crime; the reading public craved a clear and rational solution to the more 'mysterious' aspects of life. According to Simon Guerrier, the Holmes stories provided a sort of 'crash course' in scientific technique: 'the implication is that we could replicate the experiment ourselves and learn to be like Holmes. [...] But it's the repetition of the challenge that makes it so compelling' (2015: 129). Furthermore, Daniel Stashower notes that, 'Conan Doyle snatched up the inspirations of Poe and Gaboriau [and their deductive methods] and transferred them to a vibrant present' (1999: 111). It was Conan Doyle's ability to latch on to the prevailing interests of the reading public that established his writing career. The way in which Conan Doyle integrated science and technology into his stories, together with his analyses of the workings of the mind, illustrates why Guerrier applied the words of Anthony Storr on Freud to Conan Doyle, 'the light which he shed upon the human mind has [...] illumined some dark corners of human behaviour' (2015: 129).

Conan Doyle and the scientific use of the imagination

Just as Cajal believed in his 'scientific lyricism' (Cajal 1989: 281), so Conan Doyle wrote of the 'scientific use of the imagination' (2014a: 40), a theme that he used not only to explore the scientific environment, but also to consider the boundaries of what constituted acceptable and credible scientific practice. Conan Doyle often examined these ideas through the lens of characters completely committed to scientific rationalism, such as Sherlock Holmes or Professor Gilmore in *The Parasite*.

According to Douglas Kerr (2013: 130–1), as a young man, Conan Doyle had read John Tyndall's lecture on the 'Scientific Use of the Imagination', first presented in Liverpool in 1870. This seminal lecture suggested that imagination was an important tool in scientific development, '[b]ounded and conditioned by cooperant Reason, imagination becomes the mightiest instrument of the physical discoverer' (1870: 6). Conan Doyle uses the term in *The Hound of the Baskervilles*, when Holmes says, '[i]t is the scientific use of the imagination, but we have always some material basis on which to start our speculation' (2014a: 40). Not everyone agreed with Tyndall though and there was considerable controversy over his words, as commented on by P.G. Tait in his

anonymous review of Tyndall's work published in *Nature* (1871: 395). Tait was concerned at the prospect of 'the admission of imagination in the pursuit of science', saying 'there is every prospect that people whose imaginative faculty is stronger than their habit of observation will give us all plenty to do' (395). However, Holmes' power of observation would surely be up to the task, given his creed of 'I have no data yet. It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts' (Doyle 2013b: 4). Kerr writes that Holmes disapproved of Watson's 'reactionary narrative' (2013: 51) that sensationalized his work: '[d]etection is, or ought to be an exact science, and should be treated in the same cold and unimaginative manner'. According to Lawrence Frank, detective stories use similar reconstructive models of nineteenth-century historical disciplines associated with geology and archaeology and later with evolutionary biology (2009: 171).

Conan Doyle's own scientific imagination was honed during his time as a medical student in Edinburgh, although this had not always been his expected career path. From an early age, Conan Doyle had shown his ability to write and his great-uncle and godfather, Michael Conan, a journalist living in Paris, encouraged him to follow a literary path, an occupation that would be in keeping with the artistic and creative Doyle family tradition. This is in contrast to Cajal's father, who considered the arts an inappropriate career choice. In the end, however, the more practical side of Conan Doyle's personality prevailed and, in pursuit of a lucrative occupation that would enable him to repay the many sacrifices made by his mother and sisters to provide him with a good education, he decided to follow medicine. Conan Doyle was accepted at the famous medical school at the University of Edinburgh, starting his studies in October 1876 and graduating in 1881.

Medical studies proved an expensive business and, even after graduating, times were hard for Conan Doyle. He took on extra work to earn some money, embarking as the surgeon on board an Arctic whaler and then on a steamboat bound for West Africa, but perhaps his most important role was as a medical assistant, most notably for the Edinburgh lecturer Joseph Bell but also in general practices in the Midlands, which broadened his experience not just in medicine but also in life.

Joseph Bell came from a long line of Edinburgh surgeons. The university was affiliated to the Royal Infirmary of Edinburgh, and so incorporated both practical work and pioneering advances in medicine. In fact, the Edinburgh method, 'which combined

a university education in humanities and natural science with the clinical study of patients in a hospital' (Bagg 2012: 160), could be traced to the University of Leiden, where Archibald Pitcairne (1652–1713) lectured in 1692 before returning to Scotland to become a founder member of the Royal College of Physicians of Edinburgh. Just as Conan Doyle worked as a medical assistant to Bell, so Bell worked as a dresser to the progressive surgeon James Symes, who encouraged his students to attend and closely observe operations. From his close vantage point, Conan Doyle was able to witness at first hand how Bell would use his fine observation techniques to amaze the patients by identifying where they came from, their occupations, as well as their likely maladies. Not only was the physical appearance of Bell very like that of Sherlock Holmes – a tall thin man with an aquiline nose – but Conan Doyle also adopted Bell's diagnostic techniques into his stories, for example when Holmes identifies the regiment of his military visitor in 'The Adventure of the Blanched Soldier', first published in 1926, in much the same way that Bell did with his patients.

Conan Doyle openly acknowledged his debt to Joseph Bell as witnessed by an exchange with Robert Louis Stevenson. Stevenson was also at Edinburgh University, first studying engineering before switching to law, although this was a few years before Conan Doyle was there. In a letter dated 5 April 1893, Stevenson, after reading a Sherlock Holmes volume, asked Conan Doyle 'only the one thing troubles me: can this [Holmes] be my old friend Joe Bell?'. Conan Doyle replied 'I'm so glad Sherlock Holmes helped to pass an hour for you. He's a bastard between Joe Bell and Poe's Monsieur Dupin (much diluted)' (Mehew 2001: n240). Other influences are also suggested for the character of Holmes. For example, Conan Doyle was an admirer of Oliver Wendell Holmes, the American professor of anatomy, poet and essayist and refuter of spiritualism (Booth 1997: 107). Bernard Lightman also provides a very comprehensive description of the Huxley–Zadig–Cuvier–Holmes link (2014: 24–8), which follows the ratiocination of Voltaire's character Zadig, the Babylonian, through to scientific naturalism.

At the same time, Bell's was not the only methodology adopted by Conan Doyle. In 'The Adventure of the Cardboard Box', first published in 1892, Holmes's account of reading Watson's thoughts sounds like a rational explanation of how a medium might work, close observation catching the almost imperceptible responses to environmental suggestion. Sherlock Holmes works like a magician, and without his accompanying

explanations would appear to have supernatural powers that would impress: indeed as Watson says to Holmes in ‘A Scandal in Bohemia’, first published in 1891, ‘[y]ou would certainly have been burned, had you lived a few centuries ago’ (Conan Doyle 2013b: 2). A similar device is used by Poe when in ‘The Murders in the Rue Morgue’ (1841), Dupin appears to read the narrator’s mind, ‘How is it possible you should know what I was thinking of —?’ (Poe 1900: 7) asks the narrator and Dupin proceeds to explain how he was able to deduce that his friend was thinking of the short stature of the cobbler Chantilly as ‘there was not a particle of *charlatanerie* about Dupin’ (8). Conan Doyle adopted Poe’s process of abductive reasoning, or ratiocination as Poe termed it, in many of the Holmes stories, but supplementing this with his own experiences of Bell’s techniques.

The fascination with Conan Doyle’s use of scientific imagination in his detective puzzles continues unabated. The practicalities of closely observed detail and carefully collected data have always required the injection of inspired thought for, as Axel Gelfert notes, ‘without creative imagination and intuition, science would necessarily remain incomplete’ (2014: 589).

Conan Doyle and the ‘case report’

Conan Doyle, along with other writers, including Poe, often used the case report to tell his stories, most notably in the Holmes stories, where Doctor Watson is the narrator, but also in *The Parasite* (1894), where Professor Gilroy is scrupulous in noting down in his diary all that happens (1895b). For example, one of Gilroy’s entries reads, ‘April 2. Mesmerized by Miss P. (Sphygmographic chart [for measuring arterial pulse] taken by Professor Wilson)’ thus showing that proper records are kept of the experiment and lending scientific veracity to the narrative. Meegan Kennedy states that

the value of medical evidence is dependent on the perceived reliability of its vehicle in prose, the case history. Medical knowledge is thus imperilled by either a fraudulent or a sensationalistic record, for if the first lacks authenticity, the second lacks the authority implied by a pose of objective distance (2004: 330).

Brian Hurwitz (2006) considers the use of case histories and how this form of literature is often used by authors to lend credibility and veracity to an account, as the clinical case report is given weight by its professional association, endorsed by the seal of scientific and medical ethics. Jason Tougaw, in his examination of the development of

the medical case history and its use within the British novel, particularly during the nineteenth century, suggests that in fiction the case history offers ‘an almost diagnostic view of “humanity”’, suggesting that ‘the doctor–patient relationship becomes an implicit model for the relationship between a reader and a novel (or its characters)’ (2006: 2). This also brings into question the authority vested in the presentation of material (data or narrative) and whether it could be open to abuse, either by an individual, for example when a physician, such as Harold Shipman, the general practitioner who murdered many of his patients and was convicted in 2000, commits a crime, or on a wider scale, such as covert experimentation for financial or political gain or power. The case report is privileged information and even now, in the current era of ‘freedom of information’, it can still be a convoluted process to obtain the right to view this information. This suggests a form of power that controls the information on our own body, what is written about us, and how that information is used.

Case reports are also written in ‘code’, the jargon of the medical and scientific world, inaccessible to many who are not privy to the terms and their meaning, for example the use of Latin over plain English. Whether an individual or an institution, this suggests a manifestation of the ‘Great Man syndrome’, where, in this case, doctors ‘have such authority and charisma that underlings are reluctant to tell them to stand down’ (Kaplan 2007: 301) and, as Sherlock Holmes said in ‘The Speckled Band’ (1892), ‘When a doctor does go wrong, he is the first of criminals. He has the nerve and he has the knowledge’ (2014b: 175). Equally, it invites the question of whether information itself can be a mesmeric force, where individuals lose the power of voluntary action in response to the suggestion and direction of the information with which they are confronted.

In terms of case reports, it is revealing to read Conan Doyle’s own medical thesis, which is now available on the Edinburgh Research Archive. Written in 1885, ‘An essay upon the vasomotor changes in tabes dorsalis’, takes as its subject a form of neurosyphilis, then a fatal degenerative disease that now can be treated by a course of antibiotics. What is notable about Conan Doyle’s thesis is the engaging and sympathetic way in which he writes, providing a succinct but vivid picture of the symptoms of the disease and its effects on the sufferer. The devastating effects of neurosyphilis are established early in the report:

The protean nature of it's [sic] symptoms, it's [sic] strange and varying course extending over lengthy periods, baffling all treatment and dragging on from one variety of torture to another until the emaciated sufferer hails the death which relieves him of his pain, have excited the interest both of pathologists and of clinical observers (Conan Doyle 1885: 3).

As would be expected in a document of this type, there is a lot of technical detail regarding the case; however, in among the medical material, Conan Doyle provides a highly coloured description of a typical patient diagnosed with the disease:

The sufferer is commonly a man between five-and-twenty and fifty. In many cases he is of that swarthy neurotic type which furnishes the world with an undue proportion of poets, musicians and madmen (31).

This distinct type of description connects the two sides of Conan Doyle: Conan Doyle the physician who documents his work in fine detail and provides for Conan Doyle the writer the foundations of realism in his fiction that offset the more fantastic elements of his tales. Conan Doyle, like Cajal, also maintained an interest in many different areas, which included the latest thoughts and developments in both science and technology, particularly photography. During the 1880s, Conan Doyle published a number of articles in the *British Journal of Photography*. Possibly inspired by Poe's writings on photography as in 'The Daguerreotype' (1840), the concept of vision and technology nonetheless featured in many of the Sherlock Holmes stories, for example when Watson applies the term 'observing machine' to Holmes in 'A Scandal in Bohemia' (2014b: 1–26). One hundred years later, Jonathan Crary would express a similar view on the impact of devices such as the camera, 'a complex remaking of the individual as observer into calculable and regularizable and of human vision into something measurable and thus exchangeable' (1992: 17). And, as John Tagg notes, the camera holds 'a particular authority to arrest, picture and transform daily life, a power to see and record' (1988: 4). In *Membranes*, Laura Otis mentions Conan Doyle's resemblance to 'the neurobiologist Cajal in his fantasy of enhanced, voyeuristic vision' (1999: 93), quoting Holmes' desire in 'A Case of Identity' to 'fly out of that window [...] hover over this great city [...] and peep in' (Conan Doyle 2014b: 53). As Otis says, Holmes is '[a]ble to scrutinize every cranny of the imperial capital [...] He owes this accessibility due to his capacity to see things in new ways' (1999: 93). This echoes Cajal's plea in his *Reglas y consejos para la investigación científica* (1897; *Advice for a Young*

Investigator) to look at things as if for the first time, '[to] admire them afresh [...] We must free our minds of prejudice and fading images, and make a definite point to see and judge for ourselves' (Cajal 1999: 111–12). In fact, in an address to the young doctors at St Mary's Hospital in 1910, Conan Doyle noted the need for a physician to have an open mind, warning against 'undue materialism' and 'intellectual priggishness' (1910: 1066).

The important focus on 'seeing' is evident, not least because of both Conan Doyle's and Cajal's involvement with matters optical. In his early medical career, Conan Doyle studied ophthalmology and, although his involvement with this specialism was short lived, it nonetheless reflected his interest in the importance of observation. Conan Doyle described his early work as 'a sort of debased composite photograph in which five or six different styles were contending for the mastery' (Stoker 1907). Cajal's microscopy and carefully observed drawings were supplemented by his obsession with photography. Cajal mentions in *Recuerdos de mi vida* (1917; *Recollections of My Life*) that he would go on picture-taking excursions, keeping the prints 'as mementos of the youth to which we long to return' (1989: 311–12). Photography, as a way of capturing a moment, appears in 'La casa maldita' (1905; 'The Accursed House'), as the 'thundering, epic kiss' between Julián and Inés is disrupted by 'a dazzling, purple flash [that] suddenly rends the room's atmosphere, bathing the handsome pair in opaline sparkles' (Cajal 2001: 96). Inés is terrified but Julián tells her that it was 'a touch of science' as he was taking a photograph and the flash came from the magnesium lamp: he wanted 'to transcribe that scene of tenderness and bliss', so that '[i]n time, it will be a delight for [Julián's] memory and a consolation in my old age' (97). Once Inés has recovered from the shock, she is impressed by the romantic gesture and goes off to the darkroom with Julián, the narrator interrupting the story to draw the reader's attention to the fact that there may not be an ulterior motive in his proposition, while clearly suggesting that there is.

Sybylle Baumbach mentions Horst Bredekamp's theory of the 'picture act', whereby when images are looked at, 'the established relation between viewer and image demands a reaction that includes the gaze' (2015: 13). Susan Horton quotes from Henry Mayhew's 1851 interview with a street entertainer talking about the power of the camera: 'People seem to think that the camera will do anything, [...] after their portrait is taken, we ask them if they would like to be mesmerized by the camera, and the charge

is only 2d' (Horton 1991: 4). The subjects would sit still in front of the camera and gaze at it waiting to be mesmerized, eventually walking away when nothing appeared and their eyes grew weary. The showman, of course, kept the 2d, but as Susan Horton notes, because of the faith that people had in the technology, they believed that the problem lay within themselves. Ronald Thomas talks about the 'detective camera' introduced into England in 1887 (1991: 146), but references another, and earlier, detective. Dickens' Inspector Bucket in *Bleak House* (1853), a book published when photography was in its infancy, was described as 'seeming to possess an unlimited number of eyes' (2008: 335), leading to what Thomas describes as 'a perfect description of what only the revolutionary new machine called the camera was capable of doing' (1991: 137). Thomas goes on to comment that Conan Doyle's Sherlock Holmes is introduced as a 'powerful, personified camera' (147). Kerr writes that Conan Doyle believed that '[i]t was in the power of the photograph to constitute emphatic proof' (2013: 240). Sir Francis Galton (1883) in his classification of 'criminal types' notes, however, that '[a] composite portrait represents the picture that would rise before the mind's eye of a man who had the gift of pictorial imagination in an exalted degree' (1907: 223–4), which suggests that a photographic image is subjective, allowing the observer to focus on specific aspects and thus mediating what is presented to the viewer, resulting in bias and even misinterpretation.

The detailed observations in the Sherlock Holmes stories reflect Conan Doyle's talent for providing the most minute pieces of information that not only serve to give colour to his writing, but also prove to be essential to the intriguing methods of detection applied by Holmes in the stories. For example, he is able to tell so much about a person merely through the observation of, say, a boot. This reasoned, but honed ability ascribes a mystique to the detective that puts him in a class of his own. Martin Willis considers this aspect of Conan Doyle, in this case in reference to his association with Houdini: 'Conan Doyle's detective fiction and Houdini's magical performance should be seen as parallel experiments in an evolving visual culture' (Willis 2011: 174) as '[t]he criminal behaviour represented in Conan Doyle's fiction is rooted in visual trickery and often relies upon the creation of optical illusions' (174). Holmes' power to see what is invisible to others is not supernatural, but is, of course, processed and reasoned, 'You see but you do not observe', says Holmes to Watson in 'A Scandal in Bohemia' (Conan Doyle 2014b: 4). What appears to be Holmes' magic trick is

explainable. The magician in the form of Sherlock Holmes is not a mesmerist in the sense of specifically inducing a state of hypnosis in those around him, but more of a charismatic figure that fascinates not only those who appear in his stories but also the reader. In ‘The Adventure of the Cardboard Box’ (1893), Sherlock Holmes is portrayed as a maze of telegraph wires (Conan Doyle 1999: 307), leading, once again, to the notion of Holmes as an ‘observing machine’ (38). This is reminiscent of Cajal’s ‘El pesimista corregido’ (1905; ‘The Corrected Pessimist’), a story about learning to observe, in which the hero, Juan, is given the power to ‘see all objects [...] as though they have been amplified a thousand times’ by the ‘spirit of science’ (Cajal 2001: 138). At first, Juan is overwhelmed by this new view of the world, one that would normally be accessible to humans only through a microscope, but eventually he realizes how much we fail to see and that while ‘vision is based on repression and illusion [...] it can also reveal the unseen beauty of nature’ (Otis 2001: 82–3). Cajal and Conan Doyle both use observation as a means to uncover truth and suggest that technology offers a means to a decisive verdict on what is fact. This belief in the infallibility of the camera, however, was to deal a disastrous blow to Conan Doyle’s credibility later in his life when he endorsed the case of the Cottingley fairies, in which, in 1917, two Yorkshire girls claimed to have captured images of fairies which were later shown to be fake.

Holmes can often appear more machine-like than human or, particularly in his more modern incarnations in television and film, as an autistic savant (Keats 2013). Watson describes Holmes’ duality, ‘his extreme exactness and astuteness represented as I have often thought, the reaction against the poetic and contemplative mood which occasionally predominated in him’ (2014b: 42) and how Holmes’ ‘brilliant reasoning would rise to the level of intuition [...] a man whose knowledge was not that of other mortals’ (45). Even Scotland Yard defended his talents, “‘You may place considerable confidence in Mr Holmes, sir”, said the police agent loftily. “He has his own little methods, which are, if he won’t mind me saying, just a little too theoretical and fantastic, but he has the makings of a good detective in him”” (45). The stories involving Sherlock Holmes also warrant a review in terms of mesmerism and its effect on individuals, even though a ‘pseudoscience’ would seem to have little place in the rational works of the arch-detective. Hilary Grimes describes the interchange between the terms mesmerism and hypnotism as making ‘the contemporary confusion within the medical community palpable’ (2013: 68), reflecting the difficulty of establishing hypnosis as a *bona fide*

medical treatment and separating it from the more sensational connotations of mesmerism.

Grimes notes that Conan Doyle uses the term hypnosis in the Holmes story 'The Illustrious Client', whereas in his earlier stories, such as *The Parasite*, he had used the term 'mesmerism'. Grimes suggests that this is because hypnotism is being presented as a 'scientific practice, while mesmerism was associated with the supernatural and sinister powers of mind' (2013: 59). Grimes adds that hypnotism nonetheless retained its more sensationalist connotations both in the mind of the general public and in the scientific fraternity; thus, while 'Holmes' hypnotic abilities might on the surface link him to established, rational, scientific, thought, they also connect him to all of the occult possibilities of mesmerism' (59).

Conan Doyle, mesmerism and the power of the mind

According to Daniel Stashower, Conan Doyle 'studied the work of Franz Anton Mesmer' and 'as a medical man with predisposition toward the paranormal, Conan Doyle was naturally intrigued by Mesmer's theories' (1999: 88–9). Pierre Nordon also noted that '[i]n 1880 and for the next five years he [Conan Doyle] was observing psychical phenomena with sceptical curiosity' (1967: 149) and during in this time Conan Doyle published three stories dealing with mesmerism: 'The Winning Shot' (1883), 'John Barrington Coles' (1884), and 'The Great Keinplatz Experiment' (1885), all published before *A Study in Scarlet*, the first Holmes story in 1887. These mesmeric stories appeared shortly after the publication of the research that was being carried out into hypnosis in France, by Jean-Martin Charcot (Salpêtrière in Paris) and Ambroise-Auguste Liébeault and Hippolyte Bernheim (Nancy School), as a result of a re-examination of the earlier work of James Braid (Forrest 1999: 223). Charcot, who was known in France as 'le père de la neurologie' (Waraich and Shah 2017: 48), undertook his investigations into hypnosis as part of his wider neurological research. Charcot's work in neurology gained worldwide recognition in 1881 when he took part in the illustrious International Medical Congress in London, which was also attended by Robert Koch and Louis Pasteur, as reported in the *British Medical Journal* at the time (Anon. 1881: 300–3). Conan Doyle cited Charcot's neurological work in his 1886 medical thesis, albeit on the subject of *tabes dorsalis*, rather than hypnosis. However, it is clear that Conan Doyle was familiar with Charcot's highly influential work. For example, an April 1890 article published in the *Hampshire Telegraph* recorded an event

that took place at the Hampshire Society for Psychical Research. Here, Conan Doyle was reported as saying that science had provided proof of preternatural powers, i.e. beyond what is considered normal, rather than the supernatural powers that had formerly been associated with witchcraft. Conan Doyle reinforced this statement by citing ‘the investigations of Charcot and other eminent continental scientists into the phenomenon of mesmerism and clairvoyance’ (Bell 2012: 117).

In a letter to his mother dated 30 January 1880, while working as a doctor’s assistant in Birmingham, Conan Doyle tells her of a lecture that he attended entitled ‘Does Death End All?’ by the popular American preacher, Joseph Cook (1881: 275–332). While dismissing spiritualism, Cook, as a religious man, was naturally concerned with the immortality of the soul. Conan Doyle describes Cook’s talk as ‘[a] very clever thing indeed, though not convincing to me’ (Lellenberg et al. 2007: 121). Nonetheless, this evidence suggests Conan Doyle’s early interest in the more esoteric borderlands of science that is particularly evident in his early work, notably in the story ‘The Great Keinplatz Experiment’ (1882). This tale is different in tone from Conan Doyle’s other mesmeric stories, as it takes a playful, more cynical look at mesmerism and the human soul, as well as gently lampooning the figure of the ‘mad’ scientist. ‘The Great Keinplatz Experiment’ tells the story of Professor von Baumgarten, ‘a celebrated anatomist, a profound chemist, and one of the first physiologists in Europe’ at the University of Keinplatz (Conan Doyle 1890b: 84). Keinplatz (meaning ‘no place’ in German) is a play on names, used in rather than same way as Cajal uses the name of the Spanish hypnotist, Dr Mirahonda, which translates as ‘either Deep Look’ (from the verb ‘mirar’) and ‘Looks Deep’ (from the adjective ‘hondo/a’) (Cajal 2001: 75).

Professor von Baumgarten’s particular interest is in ‘psychology and the ill-defined relations between mind and matter [...] the study of the soul and the mysterious relationship of spirits’ (Conan Doyle 1890b: 84) and, having studied mesmerism for over twenty years, he held an ambition to bring these subjects together in ‘an exact new science’ (84–5). In order to achieve this, Professor von Baumgarten is committed to carrying out ‘a daring and original experiment’ to prove that the ‘mind’ can exist apart from the ‘matter’ of the body (87). This is suggestive of real investigations, although not quite to this level of sensationalism, that were carried out earlier in the nineteenth century. For example, around 1838, Herbert Mayo, Professor of Anatomy at King’s College London, carried out experiments to establish the existence of a human soul. To

this end, Conan Doyle's protagonist enlists the help of his most devoted student, Fritz von Hartmann, a feckless young man, who only agrees to help on the condition that he can marry the professor's beautiful daughter, Elise. The professor sets out his experiment, where he will mesmerize Fritz and then himself, so that, based on his theory, our souls 'could we separate them from the body, would be conscious of the presence of others' (1890b: 88) and therefore his 'spirit will have no difficulty in meeting and communing with the spirit of [his] pupil' (88).

The professor plans to publish the results of his experiment and in anticipation of this, has invited many scientific dignities to witness the demonstration. The mesmerizing experiment takes place and for an hour, during this time the bodies of the professor and Fritz lie still, until eventually they come back to life. The distinguished audience is rather surprised when the professor announces in a manner quite out of character that nothing happened at all and it was 'one of these nonsensical mesmeric experiments' (93). Meanwhile, Fritz stands up and challenges his master, claiming that: 'Our gross bodily memory is distinct from our spirit, and we cannot recall what has occurred' and reassures his audience that he will endeavour to recollect 'what occurs to [the spirits] in their free state' (94). The professor then ambles off to the local bar and proceeds to get outrageously drunk, much to the astonishment of the students who are drinking there. Fritz, on the other hand, terrifies the professor's wife by turning up at their home and acting as if he owns the place. In the end, it transpires that the experiment worked in a way that no one had expected as the souls returned to the wrong bodies. The experiment is repeated and order is restored, although the professor's publication of the affair results in his colleagues doubting his sanity.

'The Great Keinplatz Experiment' addresses the issue of the immortality of the human soul, a subject that preoccupied Conan Doyle throughout his life and career as a writer. Therefore, while he treats the subject with a light-hearted air, it nonetheless is a theme that is central to understanding his shifting and contradictory beliefs. In this story, Conan Doyle also displays his rather cynical view of the scientific establishment and its proceedings, a topic that he returned to a number of times, notably in the form of Professor Challenger, the key character in Conan Doyle's science fiction works, who discovers the unimaginable but has to battle to be heard in the great institutions that have been constructed as part of the 'professionalization' of science.

Conan Doyle was not adverse to voicing his opinions on such intellectual wars himself. For example, in 1890, a few years after writing 'The Great Keimplatz Experiment', he embarked on a journey to Berlin to attend a lecture by Robert Koch, who claimed to have found a groundbreaking new treatment for tuberculosis. With an eye to business, Conan Doyle even detoured en route to see the editor of *Review of Reviews* and succeeded in securing a commission to write a report on the findings. On arrival, however, he learned that the lecture was sold out. Not one to be defeated, Conan Doyle tracked down Koch's home address and although he failed to meet the great man, he observed the huge sacks of mail that arrived for Koch. Picturing all the hopes that were pinned on a cure for the disease, but having doubts about the efficacy of Koch's treatment based on his reading of the lecture notes and his tour of the hospital wards, Conan Doyle wrote a letter to the *Daily Telegraph* voicing his concerns, expanding on this in his piece, 'Dr. Koch and his Cure', for the *Review of Reviews*. As Daniel Stashower notes, 'one might question the authority by which Conan Doyle could make such a pronouncement [...] but he felt a duty to express his reservations in the most public form available to him' (1999: 113). He was later proved right, rather like Cajal's disagreement with the immunization programme proposed by Ferrán to combat the 1884 Spanish cholera epidemic. Conan Doyle was clearly unafraid to 'swim against the tide' (113) and refused to be intimidated by the scientific establishment.

In a collection of essays published as *Through the Magic Door* (1907) Conan Doyle said of Poe:

I look upon Poe as the world's supreme short story writer. I read [Poe's work] young when my mind was plastic. It stimulated my imagination and set before me a supreme example of dignity and force in the methods of telling a story. It is not altogether a healthy influence, perhaps. It turns the thoughts too forcibly to the morbid and the strange (1907: 121).

While he often acknowledges his debt to the character of Poe's detective, Dupin, it may have been that Conan Doyle was also influenced by other works by Poe, notably his mesmeric tales, which often deal with the relationship between the soul and the body. Poe's 'A Tale of the Ragged Mountains' published in 1844, for example, considers the psychic connection between Bedloe and his mesmerist physician. This connection becomes so strong that Bedloe can experience the memories of Dr Templeton as the doctor writes about the death of his old friend Oldeb, but, strangely, Bedloe's

experiences extend beyond Templeton's memory of what happened to his friend. Sidney Lind suggests that here Poe was not only considering the controversial contemporary topic of mesmerism but also exploring one of his own concerns, that of metempsychosis or the transmigration of the soul (1947: 1081). This subject also fascinated Conan Doyle, as in *Through the Magic Door*, he mentions a tale by the writer Edward Bulwer-Lytton entitled 'Metempsychosis', 'which left so deep an impression upon my mind' (Conan Doyle 1907: 120). Although Poe's mesmeric stories seem to be more concerned with the fate of the soul after death, whereas Conan Doyle uses the human will to effect a compelling tale, it is the figure of the mesmerist and his or her seemingly supernatural abilities to facilitate a transcendent state in others that puts the mesmerist above the traditional medical doctor and elevates him or her into a magician, although many would explain this as the patient's imagination and susceptible disposition, just as the French Royal Commission did when studying Mesmer's work in eighteenth-century Paris.

Conan Doyle's esoteric interests would be in keeping with his being a graduate of Edinburgh University, as here the excellence of the medical instruction was coupled with the ideas and influences of the Scottish School of Philosophy, which was, according to Peretz Lavie and J. Allan Hobson, 'much closer to the German rationalists than to Locke and the empiricists or to the cartesians' (1986: 232). Edinburgh was known for its interest in subjects relating to the mind and for investigations into practices such as mesmerism and hypnosis, as well as dreams and somnambulism, with men including Thomas Reid (1710–1796), Dugald Stewart (1753–1828), Sir William Hamilton (1788–1856) and Thomas Laycock (1812–1876) contributing to the debate as to the nature of what would later be known as the unconscious mind, a controversial topic that brought into play the arguments around free will.

Earlier students at Edinburgh were also influenced by the ideas that were fostered at the university. John William Polidori (1795–1821), well known for his role as physician to Lord Byron and participation in the extraordinary 'year without a summer' of 1816 at the Villa Diodati by Lake Geneva, as well as writing what is considered the prototype for future vampire literature, obtained his medical degree at the young age of nineteen. While *The Vampyre* (1819) can be seen as a key influence on later writers, including Conan Doyle, Polidori's novella also assimilates ideas from his medical studies, as well as providing a parallel to the developments that were taking place in mesmeric practice.

Polidori's thesis on the subject of somnambulism provided an examination of a topic that had been associated with animal magnetism through the work of Mesmer's pupil the Marquis de Puységur, who had introduced the notion of a mesmeric somnambulism or trance state. In turn, as discussed by Anne Stiles et al. (2010), Polidori's story *The Vampyre* was groundbreaking in terms of its suggestion of somnambulism in an equivocal narrative concerning a charismatic and supposedly vampyric antihero. The uncertainty surrounding the true nature of events as portrayed by the narrator is particularly apparent in three of Conan Doyle's mesmeric stories – 'The Winning Shot', 'John Barrington Coles' and *The Parasite* – and suggests that Conan Doyle was following what Roger Luckhurst termed the second wave of Gothic writers (2009: ix) in the late nineteenth century who investigated the borderlands of the mind, linking this dimension to the advances that were taking place in the medical world such as, for example, the research into hypnosis that was taking place in the Paris and Nancy medical schools.

This interest in determining a reality from what appear to be unknown or occult forces can be seen in a letter that Conan Doyle wrote to his mother in 1884 asking for her thoughts on the title, *Twilight Tales*, which he was proposing for a collection of stories concerning 'animal magnetism—mesmerism—and these other acknowledged powers' (Lellenberg et al. 2007: 224). In the same letter, Conan Doyle explains that *Twilight Tales* 'would have a double meaning—not only as being tales suitable for the gloaming, but as treating of the strange twilight land between the natural and the absolute supernatural' (Lellenberg et al. 2007: 224). The suggested contents included 'The Winning Shot' and 'John Barrington Cowles'; however, a collection under this title was not published until 1922, and neither of the titles mentioned in Conan Doyle's letter was included.

Published in the weekly magazine *Bow Bells* in 1883, 'The Winning Shot' is a relatively unknown work, receiving little critical scholarship despite containing a number of tropes that would reappear in Conan Doyle's Sherlock Holmes stories, such as the wild scenery of Dartmoor (Devon), disfigured faces, severed ears, and aggressive dogs. Evidence of Conan Doyle's interest in mesmerism and adoption of Gothic vampirism can be traced to another crucial 1882 letter to his mother where he writes that he has submitted 'The Winning Shot' for publication, describing it as 'a very ghastly Animal Magnetism vampirey [sic] sort of a tale' (Lellenberg et al. 2007: 171).

This letter followed on from an earlier one that year where he says, ‘I have a wonderful story on hand ‘The Winning Shot’ about mesmerism and murder [and] chemical magnetism’ (Lellenberg et al. 2007: 165).

In an 1888 unpublished essay, Conan Doyle ruminated on the moral implications of mesmeric suggestion, raising crucial questions regarding the power of the mind, particularly whether hypnotized patients could be made to act against their own moral character (issues which are fully explored in his mesmeric stories):

[A] man is impelled to do some act by the irresistible action of a hypnotic suggestion which may have been made some months before. Yet to him the action appears to emanate from himself and however *outré* it may be he will always invent some plausible reason why he has done it. [...] How can we tell that all our actions are not of this nature? What appears to us to be our own choice may prove really to have been as unalterable and inexorable as fate – the unavoidable sum total of suggestions which are acting upon us (Norden 1967: 51).

In ‘The Winning Shot’, Lottie Underwood, the first-person narrator of the story, and her Cambridge Blue fiancé, Charley, encounter Octavius Gaster, a Swedish doctor, on their late evening walk in the wilds of Dartmoor. Gaster is unusually pale, flaxen haired and ‘bloodless’ (Conan Doyle 2016: 9), showing similarities to Polidori’s vampiric depiction of Lord Ruthven in *The Vampyre*, although, unlike Ruthven, Gaster’s face is disfigured by a scar that runs across his face, forming ‘a nasty pucker at the side of his mouth’ (9). In keeping with the Gothic tradition, Gaster is apt to sudden appearances particularly in the moonlight and his fluttering black cape reminds Lottie of ‘a bloodsucking species of bat’ (9), an interesting allusion to the vampire bat, a trope of vampire fiction particularly employed some fifteen years later by Bram Stoker in *Dracula* (1897). Despite his ugliness, Gaster possesses a charisma that attracts those around him, again in the vein of Lord Ruthven. Lottie says that Gaster’s ‘slightly foreign lisp imparted a peculiar beauty to his voice’ (Conan Doyle 2016: 9) and his penetrating gaze echoes Franz Mesmer, as well as Polidori’s antihero. Gaster is welcomed by Charley’s father into the warm, comfortable upper-middle-class world of Toynby Hall and soon becomes a ‘social success’ (12), entertaining the assembled company with his adventurous tales. A source for Gaster’s theories on willpower is provided by a ‘musty old volume’ in Arabic (16), which he always keeps with him. Gaster explains that the book in question tells:

Of the days when mind was stronger than what you call matter; when great spirits lived that were able to exist without these coarse bodies of ours, and could mould all things to their so-powerful wills (Conan Doyle 2016: 16).

Here, Gaster foregrounds the mesmeric question and its ethical ramifications: the power of the mind, how such power can be unleashed, and the effects it may have on those involved: 'What can it [a person's will] not do?' he asks. Naturally, Lottie's discomfort grows as she 'could always tell [...] when his gaze was fixed upon me' (Conan Doyle 2016: 16). Lottie believes the power of his gaze 'was simply due to [her] disordered nervous system or morbid imagination' (16) but Gaster's mesmeric powers are also evident in the following passage that is focalized through Lottie's perspective, where she reports succumbing to Gaster's intense power:

That very night a thrill which I had come to know well ran through me, and awakened me from my slumbers. I stole softly to the window [...] and there was the gaunt, vampire-like figure of our Swedish visitor standing upon the gravel-walk, and apparently gazing up at my window (16).

'The Winning Shot' reaches its climax on the day of the long-awaited shooting competition and after Gaster fights with Charley over Lottie. As Charley loads his rifle for the final round and lies down ready to take his 'winning shot', Gaster reappears and stares 'with unswerving persistence upon a point midway apparently between the distant targets and himself [...] The jaw was locked, as if with some fierce effort of the will which demanded all the energy of his soul' (32). Charley is convinced that he can see someone in his line of fire, a figure that is the image of himself, but takes the shot; he wins the competition but is found dead on the ground still clutching his rifle. Conan Doyle's biographer, Andrew Lycett, notes that 'the implication is that Gaster has used his supernatural powers to transport the young man into the line of fire and to have him killed' (2007: 96), although the text suggests that this is more of an act of mind control, and that Gaster plants the idea in Charley's head, as no one else can see this figure. Furthermore, Charley is aware of Gaster's presence, which could have influenced his own behaviour.

Charley's sudden death could be a result of suggestion inflicted by the inscrutable Gaster, whose efficacy lies in the belief in supernatural forces rather than any material cause. Despite the fact that the ending remains elusive, it is clear that Conan Doyle seeks to negotiate the intellectual possibilities of suggestion, particularly how

controversial moral concepts such as the ‘power of the will’ can be represented in fiction. The implication is also that the imagination is used as a tool to reject a scientific explanation, in this case, the so-called ‘analytical method’ he commonly used in the Sherlock Holmes stories. In this way, ‘The Winning Shot’ is crafted as the reverse of Sherlock Holmes, where the latter relies on rationalistic explanations that allow closure and an unambiguous ending, while the former rejects scientific methods and points towards a more oblique and elusive power, one that relies on manipulation and the use of mesmeric techniques.

In his next story of mesmerism, ‘John Barrington Cowles’, Conan Doyle switched conventional gender roles, so that the mesmerizer is Kate Northcott, an archetypal *femme fatale*, who effects a dramatic breakdown in the mental health of her fiancés. In each case, this ruination is precipitated by a late-night summons by Miss Northcott to her home, where she reveals something so mysterious and shocking that the young man is left traumatized. The exact content of this disclosure, however, is never divulged to the reader. Portrayed by the narrator as the brightest medical student at Edinburgh University, John Barrington Cowles is a tall and good-looking man ‘with an olive, Velasquez-like face, and dark, tender eyes’, as well as ‘a handsome income from his father’ (Conan Doyle 1890a: 231). The ‘dark, tender eyes’ suggest softness rather than the more piecing gaze that is the trademark trope of the mesmerist. Despite John Barrington Cowles’ scientific aptitudes, he is depicted as a solitary man ‘passionately attached to art in every form’ (231), thus epitomizing the interplay between science and the imagination. At an art exhibition at the Scottish Academy in Edinburgh, John Barrington Cowles attracts the attention of Kate Northcott. She turns away from the paintings to stare at him, unashamedly, as she herself is the object of admiration by others. This behaviour would have been seen as improper and ‘unladylike’ in late Victorian Britain, a period characterized by its strict moral censorship. The narrator, his friend Armitage, watches the scene, describing the woman as having ‘a classically perfect countenance [...] the chin and lower jaw beautifully rounded off, and yet sufficiently developed to promise unusual strength of character’ (232). He particularly notes ‘those wonderful eyes! [...] their steely hardness, their feminine softness, their power of command’ (232), where, in contrast to John Barrington Cowles, her womanly tenderness is offset by the more masculine traits of ‘steely hardness’ and ‘power of command’ that embody the idea of the mesmeric gaze.

This harsher aspect to Miss Northcott, who shortly thereafter becomes engaged to John Barrington Cowles, is reinforced by her performing acts of animal cruelty which are witnessed by her fiancé. She holds ‘a heavy dogwhip, with which she had been chastising a small Scotch terrier, whose cries [they] had heard in the street. The poor brute was cringing up against the wall, whining piteously, and evidently completely cowed’ (242). The story seeks to foreground human power over animals and the natural world. However, Miss Northcott not only belittles the incident with the dog, but extends the example to include interpersonal control dynamics, musing that if ‘every time a man misbehaved himself a gigantic hand were to seize him, and he were lashed with a whip until he fainted [...] it would do more to keep him good than any number of high-minded theories of morality’ (243), issues which are highly suggestive of power, domination, and even sadomasochism.

Miss Northcott’s domineering impulses are traced back to her family history and, in the manner of Lombroso’s theories, Conan Doyle satirically presents his heroine’s connection with a disreputable uncle that explains her inheritance of so-called negative traits. This dubious ancestor had an interest in the occult, was rumoured to be a devil-worshipper, and had the evil eye, believing in: ‘The power of the human will and the effects of mind upon matter’ (249), although Miss Northcott views him as a hero, mistakenly believing that he died in glory on the battlefield. However, Miss Northcott bears a strong resemblance to her ‘wicked’ uncle and both are physically very attractive, therefore they do not possess any obvious physical defects that would mark them out as criminally inclined or degenerate, so undermining such theories.

With the issue of human will brought to the fore, the story moves on to a theatrical performance by Doctor Messinger who is presented as ‘the well-known medium and mesmerist’, a man who ‘had the reputation of being the soundest living authority upon the strange pseudo-sciences of animal magnetism and electro-biology’ (1890a: 250). From his box in the theatre, Armitage sees John Barrington Cowles with Miss Northcott and her aunt in the stalls below, and is able to observe when John Barrington Cowles is selected by Doctor Messinger to be the subject of his demonstration. John Barrington Cowles is about to rise, only to be caught by another force, and cannot leave his seat. Armitage spots Miss Northcott, ‘her eyes fixed intently upon the mesmerist, and with such an expression of concentrated power upon her features as I have never seen on any other human countenance’ (1890a: 252), a similar description to that offered in ‘The

Winning Shot' when Gaster is applying his will to destroy Charley. Doctor Messinger gives 'a short, gasping cry as of a man utterly worn out and prostrated by a prolonged struggle' (253). The mesmerist becomes ill and cannot continue, announcing that, '[t]here is a stronger will than mine acting against me' (253). Later, Armitage tells Miss Northcott that she 'mesmerised the mesmeriser' and expresses his fear that 'any will which can exercise such power is dangerous—for there is always a chance of its being turned to bad uses' (254). This scene voices the concerns of many Victorians regarding the loss of free will, which Fred Kaplan links to unease about 'the potential danger of one human being's holding concentrated power over another' (2015: 188). This fear is further compounded in this story by the fact that the person holding this power is a woman, which would have seemed shocking at the time.

The mesmerist's performance here echoes a lecture delivered by the French Professor Milo de Meyer on the subject of 'mesmeric forces' that Conan Doyle attended in Southsea and that was documented in an article entitled, 'Hypnotism at Southsea' (1889). This lecture took place before he wrote 'John Barrington Cowles', suggesting that Conan Doyle attended a number of such demonstrations. The article notes that Professor de Meyer invited a group of local professional men, to a private performance to showcase his skills as a mesmerist. Accordingly, ten young men had already been preselected and prepared by Professor de Meyer when 'Dr. Conan Doyle [...] volunteered to swell the number of would-be subjects' (Anon. 1889). The newspaper reported that 'an attempt to magnetise Dr Doyle in a similar manner [to the other young men who had been selected and appeared to have been successfully put into a hypnotic state] failed' (Anon. 1889). Professor de Meyer remarked, after trying to mesmerize Conan Doyle, that the process would take too long and so abandoned further attempts, but it was reported that the other experiments were highly successful and dramatic. This statement may have reinforced Conan Doyle's view, and others of the time, that mesmerism, or later hypnotism, relied on a weaker will or a nervous disposition. Therefore, the danger posed to society by those able to manipulate others is expressed by Conan Doyle's fictional mesmerist, Doctor Messinger:

[A] strong will can, simply by virtue of its strength, take possession of a weaker one, even at a distance, and can regulate the impulses and the actions of the owner of it. If there was one man in the world who had a very much more highly-developed will than any of the rest of the human family, there is no reason why he

should not be able to rule over them all, and to reduce his fellow-creatures to the condition of automatons (1890a: 152).

Significantly, the American physician George M. Gould reflected on the subject in an article published in *The Open Court* (1890), a weekly journal devoted to the works of conciliating religion with science:

[P]arenthetically it may not be superfluous to hint that hypnotism offers a clue if not a rational explanation of the manifold and monotonous mob of chronicled delusions, tyrannies, manias, and inexplicable aberrations that largely make up the subject-matter of history. Is it far from the mark to say that Napoleon was a kind of national hypnotizer? (1890: 2172).

A number of supernatural references are made in this story. John Barrington Cowles asks Armitage if he has heard of ‘Wehr-wolves [sic]’ (259); likewise, he describes Miss Northcott as having ‘a vampire soul’ (259). In a similar gender inversion, a few years earlier, J. Sheridan Le Fanu had cast a female as the undead vampire in *Carmilla* (1872), although *Carmilla* preyed upon young girls, sparking a lesbian vampire subgenre. However, rather than a literal werewolf or vampire, as S.T. Joshi notes, Conan Doyle prefers ‘the subtlety of the psychic vampire over the bloodsucking counterpart’ (2011: 78), once again, foregrounding his interest in spiritualism, the power of the mind, and the supernatural.

Conan Doyle’s interest in the subject did not abate as, in 1894, he published *The Parasite*, another tale of mesmerism. Roger Luckhurst reports that this story was originally subtitled ‘a mesmeric and hypnotic mystery’ (2000: 157). Luckhurst describes the story as ‘a condensation of scientific theories of trance available since the discursive explosion of 1889’ (2000: 157), which is the date that marks the First International Congress on Hypnosis. The research on mesmerism had been showcased at this event in Paris, lending a degree of scientific authority to this often dubious practice. By this time, Conan Doyle was not only an established author but also a wealthy one, which suggests that he still wanted to explore the subject, rather than writing purely for profit.

In *The Parasite*, Conan Doyle again casts a woman as the mesmerist. However, his adoption of a female mesmerist was not an invention as reports of women using their powers to take advantage of young men were not unknown. Hillman (1965) reports a case that appeared in the 28 February 1883 edition of the French magazine *La Lanterne*,

under the title ‘Seducer without knowing it’, where a man, accompanied by the commissioner of police, discovered his wife in a hotel room with one of his employees. She confessed that she had been mesmerizing the young man for six months, while her lover, awakened from his trance ‘seemed sincerely astonished [...], then furious’, declaring that ‘it’s a crime to have taken my honor while I slept’ (Hillman 1965: 174). As this humorous report shows, there may have been an issue around the integrity of such a story, but there was a general societal anxiety about women being able to exert such an influence on men. Catherine Wynne notes that both ‘John Barrington Cowles’ and *The Parasite* reflect ‘fears in the medical sphere concerning female mediumship’ (2006: 234), as witnessed by the actions of the Okey sisters in the wards of University College Hospital under John Elliotson in the 1830s, which involved not only gender boundaries but also those of class, and relate to the ‘democratization of mesmeric powers’ (235). The scandal surrounding John Elliotson and the Okey sisters is discussed in Chapter 2.

The Parasite features Professor Gilroy, an intelligent man of science, who holds ‘one of the first chairs in the university [given] to a man of four-and-thirty’ (Conan Doyle 1895b: 8). However, his claims to be a materialist are undermined as he notes in his diary that ‘much of my neurotic temperament survives, and that I am far from that cool, calm precision’ (8). This admission of his true nature is further evidenced by his appearance: he has dark hair and eyes, as well as an olive complexion (6), characteristics he shares with John Barrington Cowles, and which according to Conan Doyle in his medical thesis (noted earlier in this chapter), indicate ‘that swarthy neurotic type which furnishes the world with an undue proportion of poets, musicians and madmen’ (1885: 31). Later in the story, Gilroy envies his colleague, Sadler, who possesses a ‘phlegmatic Saxon temperament’ rather than a ‘black [melancholic] and Celtic’ (1895b: 72) personality. Conan Doyle is referring here to the four Hippocratic humours, with ‘black’ denoting black bile and its associated condition, melancholia.

While in the earlier stories the mesmeric protagonists were charismatic and domineering, in *The Parasite*, the renowned mesmerist Miss Penclosa, a guest of Professor Wilson, a psychologist and colleague of Professor Gilroy, is an unprepossessing woman, ‘a small, frail creature [...] Her presence was insignificant and her manner retiring’ (1895b: 12). Gilroy is introduced as an extreme sceptic of the mesmeric arts, and, in order to convince him, Miss Penclosa agrees to mesmerize

Gilroy's fiancée, Agatha. Agatha falls into a sleep-like trance and Gilroy cannot wake her no matter how hard he tries. Miss Penclosa also whispers some instructions into Agatha's ear and passes a sealed envelope to the professor, telling him to open it at ten o'clock the next day. The following morning, Agatha arrives at Gilroy's house very early, announces that their engagement is off, and leaves, but later has no recollection that she has even been out. On reading the letter from Miss Penclosa at the appointed time, Gilroy realizes that the events were triggered through suggestion while Agatha was in a trance.

Crucially, the precisely timed instructions given by Miss Penclosa resemble the thirteen-day experiment that Dr Hippolyte Bernheim of the Nancy School of Medicine carried out in September 1883. In this experiment, Bernheim instructed a hypnotized patient, S, to return to see him after thirteen days at ten in the morning. Although the patient remembered nothing of this event when he awoke from the hypnotized state, he duly returned to Bernheim at the appointed time: 'The idea presented itself to his mind only at the moment at which he was required to execute it' (Bernheim 1883-4: 555-6, quoted in LeBlanc 2004: 123). Being an avid reader of such reports, it is highly likely that Conan Doyle would have read Bernheim's study and adapted the findings to add credence to the power of the mesmerist in his story.

Conan Doyle's belief in the power of suggestion is also reflected in his 'The Romance of Medicine' address to young doctors in 1910. Here he advocates 'the value of kindness and humanity as well as of knowledge' (1910: 1066). He stresses the importance of a 'reasoned optimism' in a doctor, noting that:

We have known for all time that the cheery man was the healing man, but now in hypnotic suggestion we come upon the physical explanation of the fact. If you can convey the expectation of cure you have served your patient well (1910: 1066).

He then adds:

You need not go the lengths of a doctor I knew, who used to say to his neurotic and hysterical cases, 'Now, Miss So-and-So, you will take three doses of the medicine, and then watch the clock till it is quarter-past five, and at that instant all your troubles will disappear.' It is true that his prophecy was often fulfilled, and yet the method was perhaps a little crude for general use (1910: 1066).

This echoes the expectation of the timing of a healing crisis that Mesmer set up in his dealings with Baron Horecky de Horka, discussed in Chapter 1, which occurred just as he said it would, and also illustrates the potential power of the physician–patient relationship as well as the value of the so-called placebo effect.

In *The Parasite*, Gilroy is convinced by Miss Penclosa's mesmeric demonstration. He describes Agatha as having been reduced to an automaton, as though 'a person at a distance had worked her as an engineer on the shore might guide a Brennan torpedo' (1895b: 29–30). Despite this fearsome image, Gilroy's enthusiasm for such a spectacular new line of research prompts him to volunteer to be Miss Penclosa's next mesmeric subject. Miss Penclosa warns Gilroy of the terrible consequences of such research, considering his susceptible nature, but he persists in the interests of science. Whereas the French Royal Commission in 1784 feared that women were at risk from amoral male mesmerists, in this case, Conan Doyle reverses the gender dynamic to give the agency to the female character.

The vexed issue of the amorality of the hypnotist is discussed by Kelly Hurley, who draws attention to the experiments conducted in 1880s by Hippolyte Bernheim and Jules Liégeois (Nancy School), where hypnotized subjects would agree to lie, steal and, potentially, murder (Hurley 2015: 176). Although there was no proof that the hypnotized individuals would carry out these crimes in the real world, as opposed to the laboratory environment, some critics, such as William Newbold, argued that even under hypnosis, a patient could not be persuaded to undertake an act that was against their 'basic moral character' (1888: 238–9). These complex moral issues underpin Conan Doyle's mesmeric tales, which are strategically utilized as fictional case studies to test provocative ideas such as the power of suggestion.

Gilroy employs all means to defend himself against the next mesmeric summons from Miss Penclosa, even locking himself in his room. However, these precautions and the resistance of his own will are no defence against 'the overpowering nature of the force which pounced upon me' (Conan Doyle 1895b: 84). In order to obey Miss Penclosa's bidding, Gilroy observes himself as he employs the 'keenest and coolest judgement' to retrieve his key and negotiate his way out of his secured room. This is reminiscent of the case histories in Polidori's thesis (Petraïn 2010: 777), where somnambulists are able to carry out complicated tasks but without an apparent conscious awareness. Significantly, it also echoes the modern views of eminent sleep

specialists Mark Pressman and Roger Broughton on ‘the concept of so-called automatic behaviours – behaviours that are performed repeatedly so that higher cognitive function becomes unnecessary’ (2015: 378). At the time when Conan Doyle was writing these stories, there was also an intense fascination with telepathy, a term coined in 1882 by Frederic Myers (Luckhurst 2002: 3), a subject that was under investigation by the Society of Psychical Research, which, in turn, also reflected the ideas invoked by the introduction of wireless technology, such as telegraphy. These ‘fantastic’ developments embroiled science with the seemingly impossible idea of communication at a distance, as electricity and magnetism had done in the late eighteenth century. Gilroy’s musings – ‘the brain, I thought, secreted the mind, as the liver does the bile. But how can this be when I see mind working from a distance and playing upon matter as a musician might upon a violin?’ (1895b: 34) – go back to Gaster’s thoughts on the power of the mind and its effects in ‘The Winning Shot’, and suggest that this contentious subject that still preoccupied Conan Doyle.

Whether Miss Penclosa did exert some mental power over Gilroy, or whether Gilroy imagined the whole thing, given his established neurotic tendencies, or indeed somehow engaged with a different part of his personality, is not explained. Conan Doyle portrays the mesmerist and the concept of mind control as an invasive parasite that ‘[a]t any moment [...] may creep into me’ (104). As I noted earlier in the chapter, this image of the parasite has been explored in depth by Laura Otis (1999), who links it with the nineteenth-century fear of disorder and degeneration that prevailed despite, and perhaps because of, scientific and technical advances. In fact, as Hilary Grimes suggests, Professor Gilroy is a ‘powerful force in the mesmeric relationship’ (2013: 59) as the tale ends in Miss Penclosa’s death. If the story were examined from Miss Penclosa’s perspective, it may be that Gilroy is the parasite, seeking to take her knowledge and to use it to obtain his fellowship of the Royal Society. The story could be read as a morality tale, in that Gilroy views Miss Penclosa as a subject for experiment and is oblivious to her own emotional and physical state.

Hilary Grimes notes that scientists and writers of the late Victorian period ‘were deeply conflicted between a desire to police the boundaries of science, identity, and the mind, and conversely, to experience the obscure thrill of the “Unknown”’ (2013: 1). These issues are reflected in the three stories discussed, especially in the different types of ‘suggestion’ practised by the mesmerists, whether the patient is subdued through the

power of the mind, a dubious ‘scientific’ experiment, or inexplicable supernatural forces, showing Conan Doyle’s pluralistic interest in the scientific method, hypnotism (à la Mesmer), and spiritualism. Martin Booth comments that in early works such as ‘John Barrington Cowles’ and, later, in *The Parasite*, Conan Doyle used his interest in the supernatural ‘to spin a good tale, to refine his innate ability to disturb his readers’ (1997: 124), taking revenge, sexual guilt or obsession as particular themes, and most prevalently a curiosity about the ‘unknown’. At the same time, Conan Doyle was interested in the study of mental disorders:

[A] side of life which is too medical for the general public and too romantic for the professional journals, but which contains some of the richest human materials that a man could study (1895a: 190).

Like Poe, who used the mesmeric textbooks of the day to provide detail and add veracity to his tales, Conan Doyle utilized similar techniques by weaving his own medical experience with references to the many scandalous mesmeric experiments of the time, often adopting the tone of the case study. However, Conan Doyle offers a different representation of the mesmerist. Unlike the great scientific showman in Cajal’s ‘The Fabricator of Honor’, or Poe’s medical mesmerizers, who care for their patients but still use them as subjects for research and enquiry, Conan Doyle’s mesmerists are more ambiguous in their intent, in some cases showing no clear motivation for their acts, apart from seeking to test the moral consequences of their experiments. In this way, the stories respond to societal anxieties about the manipulation of the human mind, its possible ethical ramifications, as well as male fears of female domination, in the case of *The Parasite*.

Conclusion

Following James Braid’s ground-breaking research in the 1830s (discussed in Chapter 2), mesmerism became known as hypnosis as the nineteenth century progressed, meaning that Victorian writers such as Conan Doyle complexly grappled with the possibilities offered by accessing and controlling the mind, as well as by the fears that this fostered. Conan Doyle’s mesmeric tales spanned over a decade, examining the complex and contentious issues that were invoked, such as free will, fear of mental contagions, degeneration, and the potential for human exploitation and abuse. Charting the rise of psychology as a discipline and building on the tropes of Gothic literature to

examine the strange recesses of the mind, the stories reflect an abiding preoccupation with the interplay between science and the imagination, examining thoughts, deeds and behaviours, and daring to look at what remained invisible to the naked eye.

With the rise of accessible media there was a thirst for information, a challenge met by Conan Doyle with his prolific works of both fiction and non-fiction. In an interview with the Scottish-Canadian writer Robert Barr in 1894, Conan Doyle commented on the role of fiction:

Everybody is educated now, but comparatively few are very educated. To get an idea to penetrate to the masses of the people, you must put fiction round it, like sugar round a pill. No statesman and no ecclesiastic will have the influence on public opinion which the novelist of the future will have. [...] If he can't get his sugar right, people will refuse his pill (508).

Connecting medicine with his fiction writing, Conan Doyle's words imply that he sought to influence ideas and opinions through his fiction, and are prophetic if they are updated to include the technological methods of communication that were to follow.

Whereas Conan Doyle's writing covered a number of genres, he is best known for the stories featuring the 'consulting detective' Sherlock Holmes. Always associated in the public eye with his creation, as Simon Guerrier notes, Conan Doyle was 'transformed into [a guru] because of our need for figures of authority' (2015: 129), something that was particularly true as the British Empire began to fracture and traditional social roles were challenged. However, Conan Doyle's mix of social realism, deployed, for example, in *Round the Red Lamp* (1895a), and the use of scientific imagination in many of his other stories, indicates that he was a more nuanced writer than might be suggested by his often benign persona.

In the stories discussed above, Conan Doyle conjoined his scientific imagination with his lifelong interest in mesmerism and spiritualism in order to reflect on the historical events of his time, as well as to examine them from a more ambivalent standpoint. By incorporating real research and events that were taking place around him, Conan Doyle was able to invert traditional modes of perception and to examine them differently. His female mesmerists challenged the patriarchal norm by supporting the idea of female subversion; the scientists who experimented with their souls suffered unexpected moral consequences; and the mesmerizing foreigner who brings tragedy to those who offer him shelter draws on the idea of 'foreign invasion' explored by Otis

(cited earlier), which reflected imperialist anxieties. In short, Conan Doyle considered the consequences of the theories of the mind that were emerging from the hospitals and universities around Europe which provided, in the words of Sherlock Holmes, ‘some material basis on which to start our speculation’ (Conan Doyle 2014a: 40).

Conclusion

Benjamin Franklin wrote in 1784 that ‘treating diseases [by animal magnetism] will prove a delusion’ (Franklin 1970: 181), correctly anticipating the findings of the French Royal Commission into the subject. While the Commission, which included Franklin among its members, failed to find any material evidence of such a force, Mesmer’s therapies continued to be popular, developing over time to include new ideas and techniques, which nevertheless remained controversial. Further interest in the subject was fuelled by the acknowledgement of the French Royal Commission that the many positive outcomes in those treated by animal magnetism were due to the imagination of the patient rather than to any particular force flowing from the healer to the patient, prompting further questions concerning the role of the mind over the physical body. A re-examination of Mesmer’s work, its European reception, and how animal magnetism complexly engaged with the rapid changes that were occurring in scientific advancement and cultural attitudes from the late eighteenth century through to the early twentieth century, suggested that there remained many unanswered questions about this multifaceted and divisive topic.

This thesis has engaged with the scientific, cultural, and medical dimensions of the ‘mesmeric’ phenomenon by examining the many debates underpinning Mesmer’s reception, advocating a critical reassessment based on an interdisciplinary framework to discuss a wide-ranging corpus of material. The three case studies on Lovelace, Cajal, and Conan Doyle offered a detailed analysis of their creative, intellectual, and, in the case of Cajal, medical engagement with the mesmeric method, and provided fresh insights into the impact of animal magnetism on their lives and work. From these investigations, a number of common themes have emerged that not only informed the cultural understanding of the subject, but also made clear the relevance that these debates may have to healing practices today.

The importance of the written word in the communication and dissemination of ideas and opinions was one such theme that recurred throughout this research. Piecing together the various forms of material, both published and unpublished, revealed much about the multifarious debates that surrounded the acceptability or otherwise of theories and therapies, in this case animal magnetism and the theories and treatments derived from it. Much can be learnt about Mesmer himself from his use of the pamphlets that he

published to put forward his ideas as well to explain, and defend, his therapies. Likewise, the huge public interest in the Royal Commission's report on animal magnetism was noted by Franklin and evidenced by the document's swift translation into English by William Godwin. In addition, the narratives explored during the research, often in private correspondence, offer first-hand opinions and experiences on the subject. This is particularly true of Lovelace who witnessed Elliotson's mesmeric demonstrations, experienced the treatment herself, and described in great detail her medical encounters. The introduction of medical journals offered a forum for practitioners to discuss and critique openly the latest developments in their profession. *The Lancet*, in particular, led the field in this new wave of medical publishing. Cajal and Conan Doyle shared a desire to explain and educate the general public, as well as 'young investigators', in matters of science and medicine, ultimately using their fiction as a means to explore the possibilities, good and bad, suggested by the increasingly remote figure of the scientist/consultant or of those who were trained in the mysterious art of hypnosis. All these sources draw together to provide a comprehensive picture of the way that ideas were shared and how they travelled across professions, nations, classes and even time, as illustrated by the medical lineage that flowed from Mesmer, through to Braid and on to Charcot and Bernheim, and others. Today, these discourses continue and the fascination with the therapy of hypnosis still reaches across societal boundaries, from serious medical research through to blockbuster movies.

Over the recent decades there has been a resurgence of what has been termed alternative or complementary therapies. These are treatments that fall outside of orthodox regimens, possibly because some of these are based on principles and evidence that are not recognised by the regulatory scientific bodies, a position reminiscent of Mesmer's animal magnetism. However, in recent years, some of these therapies have been incorporated into mainstream healthcare. For example, mindfulness, or mindfulness-based cognitive therapy, which involves individuals focusing their attention on the here and now, rather than worrying about what has past and what will be. Mindfulness is very like what is known as meditation in Eastern philosophies and encompasses an awareness not only of our thoughts but also what is occurring in our bodies. The benefits of mindfulness have been recognized by the National Institute for Health and Care Excellence (NICE), the organization that provides advice and guidance

on policy and standards for health and social care within the UK, as a method to aid mental wellbeing and the therapy that can be prescribed by the NHS.

A similar therapy that has become more popular is neuro-linguistic programming (NLP), the term applied to a series of models and techniques based on the idea that establishing a desired goal in a person's mind can result in positive changes in their physiological state. This is, in effect, another form of therapy that uses the idea of embedding suggestion and is a process based on the psychological predisposition of the patient. NLP has much in common with Mesmer's power of suggestion, particularly through the impact that the imagination may have on the mind and body.

Hypnosis itself is a healing method that is still successfully used by health practitioners, whether to treat common addictions such as smoking or to alleviate pain, as practised by Cajal at the end of the nineteenth century. As shown in Chapter 3, Cajal's investigations reported that the more a patient was exposed to the experience of hypnosis, the faster and more effective were the results. This may be related to Cajal's ideas of neuroplasticity and learned behaviour, an area that is currently the subject of extensive research.

Mesmer's innovative methods and the responses of his contemporaries showed that his ultimate aim was to have his theories concerning animal magnetism endorsed by the medical authorities of the time, thus exposing his therapies to further scrutiny. While Mesmer was successful in acquiring patients, as well as amassing a large fortune from his wealthy clients, his work was dismissed by the major scientific institutions across Europe. The indefatigable Mesmer made countless appeals and protestations to these various scientific bodies through both personal petition and published essays, although in the latter he tended to veer away from attempting to explain the science behind his art to lambasting those he felt did not show suitable respect for his discoveries. However, a key problem with Mesmer's gaining official recognition for his therapies was that they were often ineffective under the critical gaze of the senior representatives of the medical fraternity, who wanted concrete proof that it was in fact animal magnetism and not suggestion that was causing any effects in those receiving the treatment. This proof, as Cajal soon realized in his own hypnotic experiment with his wife, proved inescapably elusive.

From his early trials with magnets dating back to 1774 in Vienna, Mesmer was quick to promote the theories of animal magnetism and to claim their efficacy, despite

warnings from scientists such as Father Hell, the manufacturer of the artificial magnets used in Mesmer's first treatments, who cautioned that the role of the patient's imagination should be excluded and recommended rigorous experimentation to verify any results. However, Mesmer believed that the curing of his patients should be sufficient evidence of the efficacy of the treatment and was unwilling to allow any critical research into his therapies. Despite developing a reputation as a great healer among the general public, Mesmer's divergence from orthodox medical practice and the rumours of inappropriate contact with his female patients led to disapproval from the Viennese authorities. However, his move to Paris, where strict regulations were applied to practising physicians by the city's institutions, meant that a maverick such as Mesmer would be viewed with increasing suspicion.

Mesmer's antagonistic response to the authorities, as well as rumours of mesmerism being at the centre of a growing countercultural force, eventually led to the French monarch commissioning an investigation into animal magnetism. The unprecedented report that resulted from this enquiry has been recognized as an important step in terms of clinical research, as the experiments were carefully planned to reduce the possibility of suggestion by, for example, including blindfolds and screens to conceal the activities of the magnetists.

While they provide a valuable way to compare the effects of administering an intervention, there are limitations to methods such as randomized control trials. For example, the French Royal Commission identified the roles of imitation and suggestion in the findings of the animal magnetism trials but did not investigate them further or suggest that these areas should be examined in more detail. Therefore, while restricting the scope of the study complied with the remit of the Commission, which was firmly rooted in establishing the existence, or otherwise, of animal magnetism, it missed, or deliberately ignored, the importance of the findings regarding the effects of the mind on the physical body.

A lack of adherence to the approved scientific method by those who believed in the efficacy of mesmerism can be observed in the mid-nineteenth century. For example, John Elliotson, a well-respected surgeon and professor of medicine at University College Hospital in London, embraced animal magnetism but became embroiled in an argument with the medical press, as his extravagant claims for the therapies were, once again, not backed up by rigorous experimentation. However, Elliotson had many loyal

followers, including Charles Dickens and Ada Lovelace's mother, the scholarly Lady Byron, who were very impressed by his treatments. Lovelace did not accept the mesmeric doctrine without question and was keen to carry out her own research into the subject. Elliotson went on to found his Mesmeric Infirmary in London and to set up a popular magazine, *The Zoist*, which published articles on mesmerism and a range of other alternative therapies. The continuing success of Elliotson's work, albeit outside orthodox practice, testifies to the fact that disapproval by the medical community did not always sway public opinion. This echoed the way in which animal magnetism survived its dismissal by the French Royal Commission.

A few years after the Elliotson dispute, Baron Karl von Reichenbach, a distinguished scientist whose discoveries played an important part in establishing the vast German chemical industry, published his experimental investigations into the existence of an 'Odic force', a concept that bears a strong resemblance to Mesmer's animal magnetism in that it is vital energy or innate life force connected to magnetism. This work was translated into English by William Gregory, a well-respected professor of chemistry at Edinburgh University, who endorsed the findings. However, both Lovelace and James Braid – the Manchester-based physician who would later be known for his investigations into the phenomenon that came to be called hypnosis – wrote about the lack of rigour in Reichenbach's experiments and explained vulnerability of the results to subject suggestibility. These works highlight how subtle the signs of suggestion can be and foreground the sensitivity of a patient to the smallest cues.

The effect of suggestion and how it could bring about a physiological change in patients was a key finding of the enquiry into animal magnetism carried out by the French Royal Commission, even though it did not investigate this phenomenon any further. As noted earlier, the experiments used controls to try to separate real and imaginary responses. This technique of introducing controls in the form of placebos has become standard in randomized controlled trials and the effect of placebos in clinical trials is receiving increased attention today. A study by Damien Finniss et al. found that the placebo effect is a 'genuine psychobiological phenomenon attributable to the overall therapeutic context, and that placebo effects can be robust in both laboratory and clinical settings' (2010: 686), although there are ethical issues surrounding the use of placebos, regarding disclosure and deception. Mesmer's pupil, Deslon, commented that if 'M. Mesmer had no other secret than that of using the power of the imagination to

improve health, would that not be marvellous?' (1780: 46–7). The fact that the idea of suggestion and its effects on the body are the subject of serious research more than two centuries after they were proposed illustrates the value of re-examining such historical documents and healing practices.

This idea of the importance of expectation in the efficacy of therapies is related, again, to suggestion. Ted Kaptchuk has researched the topic extensively and believes that 'rituals trigger specific neurobiological pathways that specifically modulate bodily sensations, symptoms and emotions. It seems that if the mind can be persuaded, the body can sometimes act accordingly' (2011: 1856). Mesmer cunningly understood the importance of performance and ritual, which he used to great effect in his salon to promote the healing effect. From his own dramatic appearance with his robe and wand, to the use of symbols, music, light, touch, and gaze, Mesmer ensured that his salon was designed to enhance the mental as well as the physical experience of the patient. Roy Porter noted 'The affinities between physic and ritual performance, clinched by the twinning of Apollo as the god of the arts and healing' (2001: 24), commenting that the participation of the doctor and the patient in a healing ritual is a form of mutual performance. In the same way that Conan Doyle emphasized the importance of the doctor's bedside manner, so Abraham Verghese et al. discuss how 'the ritualistic features of the bedside evaluation deepen engagement with the patient' (2011: 552). Lovelace's private correspondence provides an important record of the delicate relationship between doctor and patient, highlighting the vulnerability of the patient to the particular methods of the physician. In Lovelace's case, this was a problematic situation as her doctor did not carry out vital examinations or call in specialists and, by the time she was seen by those with experience of her condition, it was too late.

The thesis has highlighted how the roles of the scientist and medical practitioner changed from the eighteenth century onwards. Porter, commenting on William Whewell, who introduced the term 'scientist' in 1833, noted that Whewell's 'idealist contention that scientific discovery was not random but had a logical order, and so should be presided over by a regular elite of statesmanlike "scientists", appealed to Victorians eager to stock their reformed universities with a revitalised intellectual aristocracy' (Porter 1993: 39). As standardization and specialization grew in importance within the scientific and medical professions, so did the hierarchical distance between the general practitioner and the consultant. This is highlighted in Conan Doyle's work, most

notably with the humanitarian Dr Watson and the aloof consulting detective Sherlock Holmes, but Conan Doyle also explored the complex role of medical practitioners in innovative works such as the aptly titled *Round the Red Lamp: Being Facts and Fancies of Medical Life* (1894), a collection of stories depicting the medical profession through the lens of social realism.

Mesmer's fiercest detractors were the scientific and medical institutions of the day, both in Vienna and in Paris, whereas many of his patients, rich and poor, derived great benefit from his treatments. Geoffrey Sutton examined the French scientific establishment's treatment of Mesmer, finding that 'the political authority vested in the scientific institutions by the king explains and reinforced their summary scientific judgement on Mesmer' (1981: 392). Sutton claims that the institutions did not base their findings on clear scientific evidence, 'for this could be adduced in one form or another for either side of any of the issues – but rather on the basis of who belonged to their world' (392). Although the scientific trials did offer a convincing case against the existence of animal magnetism, as mentioned above, they did not investigate the reasons behind the positive therapeutic value of the treatments. As indicated by Franklin's statement that 'treating diseases [by animal magnetism] will prove a delusion' (Franklin 1970: 181), quoted at the start of this introduction, it was as if the results of the Commission's investigation were a foregone conclusion.

Later in the mid-nineteenth century, the medical establishment in the form of its literary mouthpiece, *The Lancet*, carried out a campaign to remove John Elliotson from his prestigious university post and even then continued to harangue his London Mesmeric Infirmary. However, popular opinion was still in Elliotson's favour and he continued his work on mesmerism with a loyal following.

The issue of adherence to orthodox medical ideas was of particular importance to physicians starting out in their careers. As discussed in Chapter 3, hypnosis as a therapy had divided opinion in Spain, and therefore Cajal took a cautious approach to the publication of his study of hypnosis and childbirth. This appeared in 1889, which was also the year in which Charcot hosted the First International Congress for Experimental and Therapeutic Hypnotism in Paris, thereby promoting the topic as being worthy of serious scientific discussion. Likewise, Cajal's contentious tales, *Cuentos de vacaciones* (*Vacation Stories*), provided a blistering critique of scientists and their scientific institutions, meaning that they were only published twenty years after they were first

written and just one year before Cajal received his Nobel Prize in 1905, so indicating that he felt safe to publish them without incurring the disapproval of the establishment. Conan Doyle took a different approach with his writing, particularly his more popular works, offering for example his article ‘Dr. Koch and his Cure’ for the *Review of Reviews* in 1890, where he voiced his concerns about Robert Koch’s proposed revolutionary cure for tuberculosis. Conan Doyle was later proved correct, illustrating his refusal to be intimidated by the scientific establishment. Conan Doyle and Cajal, who wrote under the pseudonym ‘Dr Bacteria’, were both keen advocates of communicating complicated scientific ideas in ways that could be understood by the general public, so ‘democratizing’ science by incorporating controversial scientific and moral issues into their fiction.

The frequent exchanges, both formal and informal, that passed among the scientific communities across Europe and into America (as demonstrated by the research in this thesis), illustrates the rapid spread of ideas and how quickly information was shared. The scientific networks linking the great European cities of Vienna, Leiden, London, Edinburgh, and Paris demonstrate the way in which Mesmer’s theories and methods were shared and migrated from city to city. For example, the Dutch physician and physicist Jan Ingenhousz wrote to his friend Benjamin Franklin soon after Mesmer’s arrival in Paris in 1778, sceptically describing animal magnetism as ‘such stuff too insipid for to get belief [sic] by any old woman’ (Ingenhousz 1988: 506), an opinion that would have raised doubts in Franklin’s mind when he conducted his investigation.

Lovelace’s enthusiasm and interest in a wide range of subjects provide a revealing picture of the cultural and scientific developments of the time. Of particular note is Lovelace’s ability to apply her imaginative vision to new technological ideas. Her translation of Menabrea’s paper on Babbage’s analytical engine, and specifically her accompanying notes that gave the report context, have been recognized as anticipating how such machines might function and their potential uses. Her work was famously referenced by Alan Turing, who pioneered computer science a century after Lovelace’s studies. This ability to apply technology to practical use can be seen in her review of Reichenbach’s mesmeric experiments. Here, she innovatively suggests the use of ‘a Daguerotype [sic] plate enclosed in a large dark chest with a Magnet’ as ‘it affords the means of testing the magnetic emanations without the aid of a human re-agent [sic]’, amply demonstrating that Lovelace sharply understood the far-reaching potential of new

technological inventions, stating that ‘Photography should become a most invaluable instrument of experimental investigation on the occult & subtle forces of nature’ (c.1846: folio 6). This was a prophetic statement as magnetic resonance imaging (MRI) technology is now being used to investigate the brain mechanics of hypnosis, although exactly how hypnosis affects the brain of a subject is still poorly understood (Cojan et al. 2009).

Cajal, too, showed his vision both literally and metaphorically. By incorporating his artistic talents, he was able to reproduce the detail of the biological material that he saw through his microscope. Yet he had the ability to move his gaze from the minutiae of a single cell to consider how such cells might communicate, which led to a revolutionary new theory on the structure of nerve cells, gaining him a Nobel Prize alongside Camilo Golgi for the staining technique that allowed Cajal to carry out his investigations. Cajal’s more esoteric interests, such as hypnotism and the study of dreams, led to a consideration of the human condition and the ways in which science and the imagination might interact, a theme explored in his *Vacation Stories*, which warn of the dangers of science, whether they be the amoral scientist or a myopic form of vision.

Like Lovelace and Cajal, Conan Doyle was drawn to the new emerging technologies, particularly photography. His imaginative engagement with the visual medium can be traced back not only to his studies as an ophthalmologist but also to his early medical work, where detailed observation was key to preparing a case study. However, Conan Doyle’s mesmeric stories enabled him to document the real research and events that were taking place around him. These ideas allowed him to invert traditional modes of perception and to examine them differently, for example, by testing the ethical and moral implications of the power of the mind.

While considering the importance of vision, both artistic and scientific, together with their place in the development of alternative perspectives, the findings of the research in this thesis suggest that there is an urgent need for critical analysis even in the most imaginative ideas. Lovelace and Braid critiqued the experiments put forward as proof of Reichenbach’s spectacular Odic force. Cajal tested his ideas on the structure of brain cells through diligent observation and experimentation. Conan Doyle challenged the mighty Koch’s proposed cure for tuberculosis. Finally, crucial to this research, while Mesmer was able to harness the power of the imagination in his theories of animal magnetism, he lacked the ability to critique his own methods.

Mesmer's well-known tantrums and stubbornness must take some responsibility for the medical fraternity's negative reception of animal magnetism. Indeed, the Achilles' heel of the mesmeric method, and of those who unquestionably followed it, was the lack of scrutiny and the inability to interrogate its workings. This idea of retaining the ability to question scientific ideas and theories is strongly advocated by Laura Otis in *Membranes*, when she notes that 'the scientist's mind should be semi-permeable, neither wide open nor completely closed' (1999: 73).

The objective of this thesis was to undertake a comprehensive study of Mesmer and his legacy and while there were clear subject areas that would be addressed as part of this work, for example the history of science, evidence-based medicine, comparative literature, and literary criticism, the original focus was deliberately not tied to any particular discipline. While the findings of this research have endorsed this wide-ranging approach as in the multi-layered discourses that were uncovered, the results also reveal a multitude of areas engaging with the medical humanities that warrant further investigation. The diverse nature of the historical material with its relevance to healing practices today offers an entanglement of scientific, medical, social and cultural processes that transcends the solely biomedical, as shown by the topics that have emerged from this research. The complex power dynamics of the doctor-patient relationship are illustrated by Mesmer's own approach to healing as well as demonstrated in the case studies. The effects of sensual stimuli and ritual in healing environments as practised by Mesmer in his salons contribute to an examination of the ways in which suggestion and belief can affect the physical body. The debate on evidence-based medicine and how patient testimony fits within this construct remains a contentious issue. Finally, the thesis discusses the importance of education as stressed by Cajal and Conan Doyle, as well as the role of personal accounts and fictional interpretations in opening up medical discourses.

As to the question of whether animal magnetism was a 'protoscience' or a 'pseudoscience', David Grimes et al. provide the following framework: 'Protoscience follows scientific principles, including the willingness to be refuted by evidence or replaced by more credible theories' (2010: 1731), whereas pseudoscience 'commonly makes claims lacking evidence or claims that conflict with evidence. It may fail to provide the opportunity for testing and refutation. The passion of its advocates tends to be inversely related to the objective evidence available' (1732). At face value,

Mesmer's presentation of animal magnetism would appear to fall into the latter category, as he failed to adequately test his theories or allow others to test them. However, Braid's extensive investigations into hypnosis did fulfil the criteria for a protoscience. Therefore, this methodological shift means that a pseudoscience can ascend to a protoscience given the correct experimental environment, just as a protoscience can become a science, where 'science is testable and its theories refutable' (Grimes et al. 2010: 1731). Regardless of the label assigned to Mesmer's work, it is clear that his methods cannot be easily pigeonholed and that they resist simplistic binary interpretations. In short, Mesmer's theories have acted as a catalyst to encourage scientists to examine the mind and how it interacts with the physical state.

Bibliography

- Aberlin, Mary Beth. 2012. 'Nervy production'. *The Scientist*. www.the-scientist.com/?articles.view/articleNo/31882/title/Nervy-Production/ (accessed 19 June 2015).
- Altman, Lawrence K. 1998. *Who Goes First? The Story of Self-experimentation in Medicine*. Berkeley, CA: University of California Press.
- Amadou, Robert (editor). 1971. *F. A. Mesmer: Le magnétisme animal, avec des notes et des commentaires de Frank A. Pattie et Jean Vinchon*. Paris: Payot.
- Anon. 1841a. 'Lectures on animal magnetism'. *Manchester Guardian*, Saturday, 13 November 1841, p. 3.
- Anon. 1841b. 'Fifth conversazione'. *Manchester Guardian*, Wednesday, 24 November 1841, p. 3.
- Anon. 1841c. 'Mr Braid's discoveries: second lecture'. *Manchester Guardian*, Wednesday, 8 December 1841, p. 3.
- Anon. 1881. 'The International Medical Congress'. *BMJ* 2(13 August): 300–3.
- Anon. 1889. 'Hypnotism at Southsea'. *The Evening News (Portsmouth)* 9 February. www.arthur-conan-doyle.com/index.php?title=Hypnotism_at_Southsea (accessed 1 March 2016).
- Babbage, Charles. 1838 (1837). *The Ninth Bridgewater Treatise. A Fragment*, 2nd edition. London: John Murray.
- Bagg, J.E. 2012. Two Scottish tales of medical compassion: Rab and His Friends & A Doctor of the Old School, with a Brief History of the Edinburgh School of Medicine (Book Review). *Texas Heart Institute Journal* 39(1): 160–1.
- Bailly, Jean-Sylvain. 2002. 'Secret report on mesmerism or animal magnetism' (no translator given). *International Journal of Clinical and Experimental Hypnosis* 50(4): 364–8.
- Bailly, Jean-Sylvain. 2014. 'Exposé'. In *The Reports of the Royal Commission of 1784 on Mesmer's System of Animal Magnetism and Other Contemporary Documents* (translated by I.M.L. Donaldson). Edinburgh: James Lind Library, Sibbald Library and Royal College of Physicians of Edinburgh.
- Barr, Robert. 1894. 'A dialogue between Conan Doyle and Robert Barr, recorded by Mr. Barr'. *McClure's Magazine* 3: 503–13.

- Barré, Pierre Yves and Radet, Jean Baptiste, 1784. *Les docteurs modernes, comédie-parade, en un acte et en vaudevilles, suivie du Baquet de santé, divertissement analogue, mêlé de couplets*. Paris: Brunet.
- Barry, Anne-Marie and Yuill, Chris. 2008. *Understanding the Sociology of Health: An Introduction*, 2nd edition. London: Sage.
- Basham, Diana. 1992. *The Trial of Woman: Feminism and the Occult Sciences in Victorian Literature and Society*. Basingstoke: Palgrave Macmillan.
- Baudelaire, Charles. 1952 (1848). *Baudelaire on Poe. Critical Papers* (translated and edited by Lois Boe Hyslop and Francis E. Hyslop, Jr). State College, PA: Bald Eagle Press.
- Baum, Joan. 1986. *The Calculating Passion of Ada Byron*. Hamden, CT: Shoe String Press.
- Baumbach, Sybylle. 2015. *Literature and Fascination*. Basingstoke: Palgrave Macmillan.
- Beaudreau, Sherry Ann and Finger, Stanley. 2006. 'Medical electricity and madness in the 18th century: the legacies of Benjamin Franklin and Jan Ingenhousz'. *Perspectives in Biology and Medicine* 49(3): 330–45.
- Beck, David. 2015. "The Dweller upon the Threshold" and the infringement of the unknown in Arthur Conan Doyle's "The Adventure of the Devil's Foot". *Clues: A Journal of Detection* 33(1): 62–71.
- Beecher Stowe, Harriet. 1870. *Lady Byron Vindicated: A History of The Byron Controversy*. Boston, MA: Fields, Osgood.
- Bell, Karl. 2012. *The Magical Imagination: Magic and Modernity in Urban England, 1780–1914*. Cambridge: Cambridge University Press.
- Bernheim, Hippolyte. 1883–4. De la suggestion dans l'état hypnotique et dans l'état de veille. *Revue Médicale de l'Est*, pp. 555–6, quoted in LeBlanc 2004, p. 123.
- Bhatt, Arun. 2010. 'Evolution of clinical research: a history before and beyond James Lind'. *Perspectives in Clinical Research* 1(1): 6–10.
- Blackwell, Elizabeth. 1895. *Pioneer Work in Opening the Medical Profession to Women: Autobiographical Sketches*. London: Longmans, Green & Co.
- Blanco, María del Pilar and Peeren, Esther (editors). 2013. *The Spectralities Reader: Ghosts and Haunting in Contemporary Cultural Theory*. New York: Bloomsbury.

- Bliss, Eugene L. 1986. *Multiple Personality, Allied Disorders and Hypnosis*. Oxford: Oxford University Press.
- Blohm, Hans, Beer, Stafford and Suzuki, David. 1986. *Pebbles to Computers: The Thread*. Toronto: Oxford University Press.
- Booth, Martin. 1997. *The Doctor, the Detective and Arthur Conan Doyle*. London: Hodder & Stoughton.
- Borch, Christian. 2006. 'The exclusion of the crowd: the destiny of a sociological figure of the irrational'. *European Journal of Social Theory* 9(1): 83–102.
- Bowden, Bertram Vivian (editor) 1971 (1953). *Faster Than Thought (A Symposium on Digital Computing Machines)*. London: Sir Isaac Pitman & Sons.
- Braid, James. 1843. *Neurypnology; or, The Rationale of Nervous Sleep, Considered in Relation with Animal Magnetism, Illustrated by Numerous Cases of Its Successful Application in the Relief and Cure of Disease*. London: John Churchill.
- Braid, James. 1846. *The Power of the Mind Over the Body: An Experimental Inquiry into the Nature and Cause of the Phenomena Attributed by Reichenbach and Others to a 'New Imponderable'*. London: John Churchill.
- Bräunlein, Peter J. 2012. 'The frightening borderlands of Enlightenment: the vampire problem'. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 43(3): 710–19.
- Brillon de Jouy, Anne Louise Boivin d'Hardancourt. 1959. Letter to Benjamin Franklin, 1 November 1779. In *The Papers of Benjamin Franklin*, Vol. 31, November 1, 1779, through February 29, 1780 (edited by Leonard Woods Labaree et al.). New Haven, CT: Yale University Press, p. 8.
- Buranelli, Vincent. 1975. *The Wizard from Vienna*. New York: Coward, McCann & Geoghegan.
- Burrow, Merrick. 2013. Conan Doyle's gothic materialism. *Nineteenth Century Contexts* 35(3): 309–23.
- Byron, George Gordon, Lord. 1837. *Byron's Works in One Volume*. London: John Murray.
- Byron, George Gordon, Lord. 1981. *Lord Byron's Letters and Journals*, Vol. 11, *For Freedom's Battle* (edited by Leslie A. Marchand). Cambridge, MA: Belknap Press.

- Canter, David and Youngs, Donna. 2009. *Investigative Psychology: Offender Profiling and the Analysis of Criminal Action*. Chichester: John Wiley.
- Cantor, Geoffrey. 1993. *Michael Faraday: Sandemanian and Scientist: A Study of Science and Religion in the Nineteenth Century*. Basingstoke: Palgrave Macmillan.
- Carpenter, W.B. 1852. 'On the influence of suggestion in modifying and directing muscular movement, independently of volition'. *Royal Institution of Great Britain, (Proceedings)*, 1852, 12 March: 147–53.
- Caudill, David S. 2011. *Stories About Science in Law (Law, Language and Communication)*. Farnham: Ashgate.
- Cojan, Yan, Waber, L., Schwartz, S., Rossier, L., Forster, A. and Vuilleumier, P. 2009. 'The brain under self-control: modulation of inhibitory and monitoring cortical networks during hypnotic paralysis'. *Neuron* 62(6): 862–75.
- Collier, Bruce. 1990. *The Little Engines that Could've: The Calculating Machines of Charles Babbage*. New York: Garland.
- Conan Doyle, Sir Arthur. 1885. 'An essay upon the vasomotor changes in tabes dorsalis'. Thesis presented in the hope of obtaining the degree of the Doctorship of Medicine of the University of Edinburgh. Edinburgh Research Archive. www.era.lib.ed.ac.uk/handle/1842/418 (accessed 1 June 2018).
- Conan Doyle, Sir Arthur. 1890a (1884). 'John Barrington Cowles'. In *The Captain of the Polestar and Other Tales*. London: Longman, Green and Co. www.archive.org (accessed 1 March 2016).
- Conan Doyle, Sir Arthur. 1890b (1885). 'The Great Keinplatz Experiment'. In *The Captain of the Polestar and Other Tales*. London: Longman, Green and Co. www.archive.org (accessed 1 March 2016).
- Conan Doyle, Sir Arthur. 1895a (1894). *Round the Red Lamp: Being Facts and Fancies of Medical Life*. Leipzig: Bernhard Tauchnitz. www.archive.org/files (accessed 1 March 2016).
- Conan Doyle, Sir Arthur. 1895b (1894). *The Parasite: A Story*. New York: Harpers & Brothers. www.archive.org (accessed 1 March 2016).
- Conan Doyle, Sir Arthur. 1907. *Through the Magic Door*. London: Smith Elder.
- Conan Doyle, Sir Arthur. 1910. 'St. Mary's Hospital. Introductory address on "The Romance of Medicine" '. *The Lancet* 22(4545): 1066–8.

- Conan Doyle, Sir Arthur. 1999 (1893). *The Original Illustrated 'Strand' Sherlock Holmes*, Vol. 1. Ware: Wordsworth Editions.
- Conan Doyle, Sir Arthur. 2014a (1902). *The Hound of the Baskervilles*. Tunbridge Wells: Solis Press.
- Conan Doyle, Sir Arthur. 2014b (1902). *The Adventures of Sherlock Holmes*. Tunbridge Wells: Solis Press.
- Conan Doyle, Sir Arthur. 2016 (1883). *The Winning Shot*. Tunbridge Wells: Solis Press.
- Cook, Joseph, Rev. 1881. 'Does Death End All?' *The Boston Monday Lectures*, Vol. I. London: R.D. Dickinson.
- Crabtree, Adam. 1988. *Animal Magnetism, Early Hypnotism, and Psychical Research, 1766–1925: An Annotated Bibliography*. New York: Kraus.
- Crabtree, Adam. 1993. *From Mesmer to Freud: Magnetic Sleep and the Roots of Psychological Healing*. New Haven, CT: Yale University Press.
- Crary, Jonathan. 1992. *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*. Cambridge, MA: MIT Press.
- Darnton, Robert. 1968. *Mesmerism and the End of the Enlightenment in France*. Cambridge, MA: Harvard University Press.
- Davis, Ryan. 2012. 'Suggestive characters: hypnotism and subjectivity in Blanca de los Ríos's *Las hijas de Don Juan* (1907)'. *Decimonónica* 9(1): 1–16.
- De Carlos, Juan A. and Borrell, José. 2007. 'A historical reflection of the contributions of Cajal and Golgi to the foundations of neuroscience'. *Brain Research Reviews* 55: 8–16.
- De Morgan, Sophia. 1895. *Memoirs of Threescore and Ten Years: Reminiscences of the Late Sophia Elizabeth De Morgan* (edited by Mary A. De Morgan). London: Richard Bentley & Son.
- DeFelipe, Javier. 2010. *Cajal's Butterflies of the Soul: Science and Art*. Oxford: Oxford University Press.
- Delaunay, Paul. 1906. *Le Monde Médical Parisien au Dix-huitième Siècle*. Paris: Librairie Médicale et Scientifique Jules Rousset.
- Deslon, Charles. 1780. *Observations sur le Magnétisme Animal*. London (and Paris): Didot/Saugrain/Clousier.

- Deslon, Charles. 1784. *Observations sur les deux rapport de MM. Les Commisionaires nommes par sa Majesté, pour l'examen du magnétisme animal par M. d'Esilon*. Paris: Chez Clousier.
- Dickens, Charles. 1853. 'Fairyland in 'Fifty-Four'. *Household Words* VIII: 313–16.
- Dickens, Charles. 2008 (1853). *Bleak House*. Oxford: Oxford University Press.
- Didi-Huberman, Georges. 2003 (1982). *Invention of Hysteria: Charcot and the Photographic Iconography of the Salpêtrière* (translated by Alisa Hartz). Cambridge, MA: MIT Press.
- Disraeli, Benjamin. 1837. *Venetia or the Poet's Daughter, Vivian Grey and Henrietta Temple* in three volumes. London: Henry Colburn.
- Doidge, Norman. 2015. Hypnosis, neuroplasticity, and the plastic paradox. *American Journal of Clinical Hypnosis* 57(3): 349–54.
- Donaldson, I.M.L. 2005. 'Mesmer's 1780 proposal for a controlled trial to test his method of treatment using "animal magnetism" '. *Journal of the Royal Society of Medicine* 98(12): 572–5.
- Du Maurier, George. 2009 (1894). *Trilby*. Oxford: Oxford World Classics.
- Duveen, Denis I. and Klickstein, Herbert S. 1955. 'Benjamin Franklin (1706–1790) and Antoine Laurent Lavoisier (1743–1794). Part II. Joint investigations'. *Annals of Science* 11(4): 271–302.
- Ehrlich, Benjamin. 2016. *The Dreams of Santiago Ramón y Cajal*. New York: Oxford University Press.
- Ellenberger, Henri F. 1970. *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry*. New York: Basic Books.
- Elliotson, John. 1846. 'Review of an *Abstract of Researches on Magnetism and on certain allied subjects, including a supposed new Imponderable*'. *The Zoist* IV(XIII): 104–26.
- Essinger, James. 2014. *A Female Genius*. London: Gibson Square.
- Everdell, William R. 1997. *The First Moderns: Profiles in the Origins of Twentieth-century Thought*. Chicago, IL: University of Chicago Press.
- Faraday, Michael. 1846. 'Experimental researches in electricity'. *Philosophical Transactions of the Royal Society of London* 136: 1–20.

- Faraday, Michael. 1999. *The Correspondence of Michael Faraday: 1849–December 1855*, Vol. 4 (SP) (*History and Management of Technology*) (edited by Frank A.J.L. James). Stevenage: Institute of Electrical Engineers.
- Finniss, Damien G., Kaptchuk, T.J., Miller, F. and Benedetti, F. 2010. 'Biological, clinical, and ethical advances of placebo effects'. *The Lancet* 375(9715): 686–95.
- Forrest, Derek. 1999. *Hypnotism: A History*. Harmondsworth: Penguin.
- Forrest, Derek. 2002. 'Mesmer'. *International Journal of Clinical and Experimental Hypnosis* 50(4): 295–308.
- Foster, Vere (editor). 1898. *The Two Duchesses*. London: Blackie.
- Foucault, Michel. 1975 (1963). *The Birth of the Clinic: An Archaeology of Medical Perception* (translated by A.M. Sheridan). New York: Vintage Books.
- Frank, Lawrence. 2009 (2003). *Victorian Detective Fiction and the Nature of Evidence: The Scientific Investigations of Poe, Dickens, and Doyle*. London: Palgrave Macmillan.
- Franklin, Benjamin. 1785. Letter to Jan Ingenhousz, 29 April 1785 (unpublished). *The Papers of Benjamin Franklin*. <http://franklinpapers.org/franklin//framedVolumes.jsp> (accessed 1 May 2018).
- Franklin, Benjamin. 1906 (1779–1790). *Calendar of the papers of Benjamin Franklin in the Library of the American Philosophical Society*, Vols II and III (prepared by Isaac Minis Hays). Philadelphia, PA: University of Pennsylvania.
- Franklin, Benjamin. 1970 (1783–1784). *The Writings of Benjamin Franklin*, Vol. IX (collected and edited by Albert Henry Smith). New York: Haskell House.
- Franklin, Benjamin. 2017a. Reply to Anton Mesmer, 23 May 1784. In *The Papers of Benjamin Franklin*, Volume 42: March 1 through August 15, 1784 (edited by Ellen B. Cohn). New Haven, CT: Yale University Press, p. 251.
- Franklin, Benjamin. 2017b. Reply to la Sablière de la Condamine, 19 March 1789. In *The Papers of Benjamin Franklin*, Vol. 42, March 1 through August 15, 1784 (edited by Ellen B. Cohn). New Haven: CT: Yale University Press.

- Franklin, Benjamin, Majault, Le Roy, Sallin, Jean-Sylvain Bailly, D'arcet, De Bory, Joseph-Ignace Guillotin and Lavoisier, Antoine. 2002. 'Report of the commissioners charged by the king with the examination of animal magnetism' (translated by C. Salas and D. Salas). *International Journal of Clinical and Experimental Hypnosis* 50(4): 332–63. (First published in *Skeptic* 1997, 4: 66–83.)
- Gall, David A. and Finger, Stanley. 2000. 'The power of a musical instrument: Franklin, the Mozarts, Mesmer, and the glass armonica'. *History of Psychology* 3(4): 326–43.
- Galton, Francis. 1907 (1883). *Inquiries into Human Faculty and Its Development*. London: J.M. Dent.
- Gelfert, Axel. 2014. 'Observation, inference, and imagination: elements of Edgar Allan Poe's philosophy of science'. *Science & Education* 23(3): 589–607.
- Godwin, William. 1785. *Report of Dr. Benjamin Franklin, and Other Commissioners, Charged by the King of France, with the Examination of Animal Magnetism, as now Practised at Paris. Translated from the French. With An Historical Introduction*. London: J. Johnson.
- Goetz, C.G., Bonduelle, M. and Gelfand, T. 1995. *Charcot: Constructing Neurology*. New York: Oxford University Press.
- Goldsmith, Margaret. 1934. *Franz Anton Mesmer—A History of Mesmerism*. New York: Doubleday, Doran.
- Gordin, Michael, Grundes, Walter, Walker, Mark and Wang, Zuoyue. 2002. '“Ideologically correct” science'. In *Science and Ideology: A Comparative History* (edited by Mark Walker). London: Routledge, pp. 35–65.
- Gould, George M. 1890. The ethics of hypnotism. *The Open Court* No. 135, 27 March, pp. 2172–4. <https://archive.org/details/opencourt41890caru> (accessed 4 January 2016).
- Grand, Sarah. 1894. 'The new aspect of the woman question'. *The North American Review* 158(448): 270–6.
- Gravitz, Melvin A. 1997. 'Mesmerism and Masonry: early historical interactions'. *American Journal of Clinical Hypnosis* 39(4), 266–70.
- Green, Christopher D., Shore, Marlene and Teo, Thomas (editors). 2001. *The Transformation of Psychology: Influences of 19th-Century Philosophy, Technology, and Natural Science*. Washington, DC: American Psychological Association.

- Greenhow, T.M. 1845. 'Miss Martineau's case'. *The Lancet* 45(114): 19–20.
- Grew, Chris. 2014. *Hypnotherapist's Handbook* (translated from Danish). Ebook, published by Forlaget Akasha.
- Grimes, David A., Schultz, Kenneth F. and Raymond, Elizabeth G. 2010. 'Surrogate end points in women's health research: science, protoscience, and pseudoscience'. *Fertility and Sterility* 93(6): 1731–4.
- Grimes, Hilary. 2013. *Late Victorian Gothic: Mental Science, the Uncanny, and Scenes of Writing*. Abingdon: Routledge.
- Guerrier, Simon. 2015. 'My immortal Holmes'. *The Lancet Psychiatry* 2(2): 128–9.
- Habbe, Laura. 2015. The horrors of scientific investigation: parasitic mesmerism in Arthur Conan Doyle's *The Parasite*. *The Irish Journal of Gothic and Horror Studies* Issue 14: 48–62.
- Harris, Ruth. 1985. 'Murder under hypnosis in the case of Gabrielle Bompard: Psychiatry in the Courtroom in Belle Epoque Paris'. In *The Anatomy of Madness: Essays in the History of Psychiatry*, Vol. 2 (edited by William Bynum, Roy Porter and Michael Shepherd). London: Tavistock, pp. 197–241.
- Hartree, D.R. 1949. *Calculating Instruments and Machines*. Champaign, IL: University of Illinois Press.
- Hawkins, Anne Hunsaker. 1999. *Reconstructing Illness*, 2nd edition. West Lafayette, IN: Purdue University Press.
- Haygarth, John. 1800. 'Of the imagination, as a cause and as a cure of disorders of the body; exemplified by fictitious tractors, and epidemical convulsions'. Read to the Literary and Philosophical Society of Bath. Printed by Cruttwell, Bath.
- Hillman, Robert G. 1965. 'A scientific study of mystery: the role of the medical and popular press in the Nancy-Salpêtrière controversy on hypnotism'. *Bulletin of the History of Medicine* 39: 163–82.
- Hobhouse, John Cam, Baron Broughton. 1909. *Recollections of a Long Life*, with additional extracts from his private diaries edited by his daughter Lady Dorchester. London: John Murray.

- Horton, Susan R. 1991. 'Were they having fun yet? Victorian optical gadgetry, modernist selves'. In *Victorian Literature and the Victorian Visual Imagination* (edited by Carol T. Christ and John O. Jordan). Berkeley, CA: University of California Press.
- Hughes, William. 2015. *That Devil's Trick: Hypnotism and the Popular Imagination*. Manchester: Manchester University Press.
- Hurley, Kelly. 2015. 'Science and the Gothic'. In *The Victorian Gothic: An Edinburgh Companion* (edited by Andrew Smith and William Hughes). Edinburgh: Edinburgh University Press.
- Hurwitz, Brian. 2006. 'Form and the representation in clinical case reports'. *Literature and Medicine* 25(2): 216–40.
- Hyman, Anthony. 1982. *Charles Babbage: Pioneer of the Computer*. Princeton, NJ: Princeton University Press.
- Ince, Richard Basil. 1920. *Franz Anton Mesmer: His Life and Teaching*. London: William Rider.
- Ingenhousz, Jan. 1988. 'To Benjamin Franklin from Jan Ingenhousz, 5 October 1778'. In *The Papers of Benjamin Franklin*, Vol. 27, July 1 through October 31, 1778 (edited by Claude A. Lopez). New Haven, CT: Yale University Press, pp. 504–6.
- Jacobson, Marcus. 1995. *Foundations of Neuroscience*. New York: Plenum Press.
- Jacobson, Marcus. 2005. 'Beginnings of the nervous system'. In *Developmental Neurobiology*, 4th edition (edited by Mahendra S. Rao and Marcus Jacobson). New York: Springer, pp. 365–413.
- Jensen, Matthew B., Janik, Erika L. and Waclawik, Andrew J. 2016. 'The early use of blinding in therapeutic clinical research of neurological disorders'. *Journal of Neurological Research and Therapy* 1(2): 4–16.
- Jones, R. 2009. Thomas Wakley, plagiarism, libel and the founding of *The Lancet*. *Journal of the Royal Society of Medicine* 102(10): 404–10.
- Joshi, S.T. (editor). 2011. *Encyclopedia of the Vampire: The Living Dead in Myth, Legend, and Popular Culture*. Santa Barbara, CA: Greenwood Press.
- Kaplan, Fred. 2015 (1975). *Dickens and Mesmerism: The Hidden Springs of Fiction*, 2nd edition. Princeton, NJ: Princeton University Press.

- Kaplan, Robert M. 2007. 'The clinicide phenomenon: an exploration of medical murder'. *Australasian Psychiatry* 15(4): 299–304.
- Kaptchuk, Ted J. 2011. 'Placebo studies and ritual theory: a comparative analysis of Navajo, acupuncture and biomedical healing'. *Biological Sciences* 366(1572): 1849–58.
- Kay-Shuttleworth, Sir James Phillips. 1841. Extracts from his journal. John Rylands Library, University of Manchester. Kay-Shuttleworth Papers. GB 133 JKS/1/2/12, Extracts 3 and 11.
- Keats, Jonathon. 2013. 'The science of Sherlock Holmes'. *New Scientist, Culture Lab*, 9 January. www.newscientist.com/blogs/culturelab/2013/01/the-science-of-sherlock-holmes.html (accessed 31 March 2016).
- Keene, Melanie. 2015. *Science in Wonderland: The Scientific Fairy Tales of Victorian Britain*. Oxford: Oxford University Press.
- Kennedy, Meegan. 2004. 'The ghost in the clinic: gothic medicine and curious fiction in Samuel Warren's diary of a late physician'. *Victorian Literature and Culture* 32(2): 327–51.
- Kerr, Douglas. 2013. *Conan Doyle: Writing, Profession, and Practice*. Oxford: Oxford University Press.
- Kidd, M. and Modlin, I.M. 2001. 'Van Swieten and the renaissance of the Vienna Medical School'. *World Journal of Surgery* 25(4): 444–50.
- Kihlstrom, John F. 2013. 'Neuro-hypnotism: prospects for hypnosis and neuroscience'. *Cortex* 49(2): 365–74.
- Konnikova, Maria. 2013. *Mastermind*. Edinburgh: Canongate.
- Kors, Alan Charles. 1976. *D'Holbach's Coterie: An Enlightenment in Paris*. Princeton, NJ: Princeton University Press.
- Kroger, Kenton. 2007. *The Sleep of Others and the Transformation of Sleep Research*. Toronto: University of Toronto Press.
- Krueger, Christie L. and Stade, George. 2003. *Encyclopedia of British Writers, 19th and 20th Centuries*. New York: Facts on File.
- Landauer, Ali A. 1981. 'A note on the role of Karl Christian Wolfart (1778–1832) in the study of animal magnetism'. *Journal of the History of the Behavioral Sciences* 17(2): 206–8.

- Lanfranco, Renzo Carlo, Canales-Johnson, Andrés and Huepe, David. 2014. 'Hypnoanalgesia and the study of pain experience: from Cajal to modern neuroscience'. *Frontiers in Psychology* 5, No. 01126, doi: 10.3389/fpsyg.2014.01126 (accessed 12 January 2015).
- Lanska, D.J. and Lanska, J.T. 2007. 'Franz Anton Mesmer and the rise and fall of animal magnetism: dramatic cures, controversy, and ultimately a triumph for the scientific method'. In *Brain, Mind and Medicine: Essays in Eighteenth-century Neuroscience* (edited by H. Whitaker, C.U.M. Smith and S. Finger). Boston, MA: Springer, pp. 301–20.
- Lavie, Peretz and Hobson, J. Allan. 1986. 'Origin of dreams: anticipation of modern theories in the philosophy and physiology of the eighteenth and nineteenth centuries'. *Psychological Bulletin* 100(2): 229–40.
- Le Fanu, J. Sheridan. 2016 (1819). 'Carmilla'. In *Horror Tales* (edited by George Cavendish). Tunbridge Wells: Solis Press, pp. 37–102.
- Leach, Nathaniel. 2014. 'Gendering pseudo-science: Inchbald's *Animal Magnetism*'. *Literary Compass* 11(11): 715–23.
- LeBlanc, A. 2004. 'Thirteen days: Joseph Delboeuf versus Pierre Janet on the nature of hypnotic suggestion'. *Journal of the History of the Behavioral Sciences* 40(2): 123–47.
- Lehner, Ulrich L. 2010. Introduction. In *A Companion to the Catholic Enlightenment in Europe* (edited by Ulrich Lehner and Michael Printy). Leiden: E.J. Brill.
- Lehner, Ulrich L. 2013. 'How enlightened can a monk be? The efforts of eighteenth-century German Benedictines to reform monastery and church'. *Journal of Religious History* 37(1): 64–79.
- Leighton, Mary Elizabeth. 2006. 'Under the influence: crime and hypnotic fictions of the *fin de siècle*'. In *Victorian Literary Mesmerism* (edited by Martin Willis and Catherine Wynne). Amsterdam: Rodopi, pp. 203–22.
- Lellenberg, Jon, Stashower, Daniel and Foley, Charles (editors). 2007. *Arthur Conan Doyle: A Life in Letters*. London: Harper Press.
- Lerma, Juan and De Carlos, Juan. 2014. 'Epilog: Cajal's unique and legitimated school'. *Frontiers in Neuroanatomy* 8, Article 58. doi: 10.3389/fnana.2014.00058 (accessed 12 January 2015).

- Lightman, Bernard. 2014. 'Conan Doyle's ideal reasoner'. *Journal of Literature and Science* 7(2): 19–36.
- Lind, Sidney, E. 1947. 'Poe and mesmerism'. *PMLA* 62(4): 1077–94.
- Lovelace, Ada. 1844. Letter to Michael Faraday, November 1844. London: IET Archive.
- Lovelace, Ada. c.1846. Draft review of 'Abstract of Researches on Magnetism and on certain allied subjects, including a supposed new Imponderable, by Baron von Reichenbach', translated and abridged from the German by William Gregory M.D., F.R.S.E., M.R.I.A &c. (Taylor & Walton). Lovelace-Byron Papers, Bodleian Library, Oxford University. Box 175, mss 211.
- Luckhurst, Roger. 2000. Trance gothic, 1882–97. In *Victorian Gothic* (edited by Ruth Robbins and Julian Wolfreys). Basingstoke: Palgrave Macmillan.
- Luckhurst, Roger. 2002. *The Invention of Telepathy: 1870–1901*. Oxford: Oxford University Press.
- Luckhurst, Roger (editor). 2009. Introduction. In *Late Victorian Gothic Tales*. Oxford: Oxford University Press.
- Lycett, Andrew. 2007. *The Man Who Created Sherlock Holmes*. New York: Free Press.
- Lynn, Michael R. 2006. *Popular Science and Public Opinion in Eighteenth-century France*. Manchester: Manchester University Press.
- Lynn, Steven Jay and Lilienfeld, Scott. 2002. 'A critique of the Franklin Commission Report: hypnosis, belief and suggestion'. *International Journal of Clinical and Experimental Hypnosis* 50(4): 369–86.
- Mai, Juergen K. and Paxinos, George, editors. *The Human Nervous System*. London: Academic Press, 2012.
- Maindron, Ernest. 1888. *L'Académie des Sciences. Histoire de L'Académie*. Paris: Alcan.
- Martineau, Harriet. 1845. *Letters on Mesmerism*. London: Edward Moxon.
- Martineau, Harriet. 1877. *Autobiography*, three vols. London: Smith, Elder & Co.
- Martins, Roberto de Andrade. 2011. 'The rise of magnetochemistry from Ritter to Hurmuzescu'. *Foundations of Chemistry* 14(2): 157–82.
- Mead, Correy. 2017. *Angelic Music: The Story of Ben Franklin's Glass Armonica*. New York: Simon & Schuster.

- Mead, Richard. 1748 (1704). *A Treatise Concerning the Influence of the Sun and Moon Upon Human Bodies*, 2nd edition (translated from the Latin under the author's inspection by Thomas Stack). London: J. Brindley.
- Mehew, Arthur (editor). 2001. *Selected Letters of Robert Louis Stevenson*. New Haven, CT: Yale University Press.
- Menabrea, Baron L.F. and Lovelace, A.L. (Appendices). 1889 (1843). *Sketch of the Analytical Engine invented by Charles Babbage, Esq.* [From the *Bibliothèque Universelle de Genève*, No. 82. October 1842.] (translated and annotated by Ada Lovelace). In *Babbage's Calculating Engines. Being a Collection of Papers Relating to Them: Their History and Construction* (edited by Henry P. Babbage). Cambridge: Cambridge University Press. (The original translation was published in *Scientific Memoirs* Article xxix, vol. iii, pp. 666–731. London: Richard & John E. Taylor).
- Menke, Richard. 2008. *Telegraphic Realism: Victorian Fiction and Other Information Systems*. Stanford, CA: Stanford University Press.
- Mesmer, Franz A. and Bloch, George. 1980. *Mesmerism: A Translation of the Original Scientific and Medical Writings of F.A. Mesmer*. Los Altos, CA: W. Kaufman.
- Mesmer, Franz Anton and Frankau, Gilbert (Introduction). 1948 (1779). *Mesmerism By Doctor Mesmer (1779) Being the first translation of Mesmer's historic Mémoire sur la découverte du Magnétisme Animal to appear in English* (translated by V.R. Meyers). London: Macdonald.
- Mesmer, Franz Anton. 1959a. Letter to Benjamin Franklin, prior to 1 November 1779. In *The Papers of Benjamin Franklin*, Vol. 31, November 1, 1779, through February 29, 1780 (edited by Leonard Woods Labaree et al.). New Haven, CT: Yale University Press, p. 5.
- Mesmer, Franz Anton. 1959b. Letter to Benjamin Franklin, 1 December 1779. In *The Papers of Benjamin Franklin*, Vol. 31, November 1, 1779, through February 29, 1780 (edited by Leonard Woods Labaree et al.). New Haven, CT: Yale University Press, p. 186.
- Mesmer, Franz Anton, et al. 1778. *Sammlung der neuesten gedruckten und geschriebenen Nachrichten von Magnet-Curen, vorzüglich der Mesmerischen*. Leipzig: Hilscher.

- Mesmer, Franz Anton. 1971 (1781). 'Précis historique des faits relatifs au magnétisme animal jusques en avril 1781'. In *F. A. Mesmer: Le magnétisme animal, avec des notes et des commentaires de Frank A. Pattie et Jean Vinchon* (edited by Robert Amadou). Paris: Payot, pp. 91–194.
- Mesmer, Franz Anton. 2017. Letter to Benjamin Franklin, 14 May 1784. In *The Papers of Benjamin Franklin*, Vol. 42, March 1 through August 15, 1784 (edited by Ellen B. Cohn). New Haven, CT: Yale University Press, pp. 247–50.
- Miller, Jonathan, 2001. 'Magnetic mockeries'. *Social Research* 68(3): 717–40.
- Moore, Doris Langley. 1977. *Ada, Countess of Lovelace: Byron's Legitimate Daughter*. London: John Murray.
- Moore, Thomas. 1832. *Life of Lord Byron*, Vol. 4 *With His Letters and Journals*. London: John Murray.
- Moran, Joe. 2010. *Interdisciplinarity (The New Critical Idiom)*, 2nd edition. London: Routledge.
- Morus, Iwan Rhys. 2011. *Shocking Bodies: Life, Death & Electricity in Victorian England*. Stroud: The History Press.
- Mozart, Leopold. 1938. *The Letters of Mozart and His Family*, Vol. I, 1769–91 (chronologically arranged, translated and edited with an Introduction, Notes and Indices by Emily Anderson). London: Macmillan.
- Mozart, Wolfgang Amadeus. 1866. *The Letters of Wolfgang Amadeus Mozart (1769–1791)*, Vol. II (translated from the collection of Ludwig Nohl by Lady Wallace). New York: Hurd & Houghton.
- Newbold, William Romaine. 1888 'Posthypnotic and criminal suggestion'. *Popular Science Monthly* 49: 230–41.
- Newton, Isaac. 1846 (1687). *Newton's Principia: The Mathematical Principles of Natural Philosophy*, Book III (translated by Andrew Motte). New York: Daniel Adee.
- Nightingale, Florence. 2003. *Florence Nightingale on Society and Politics, Philosophy, Science, Education and Literature. Collected Works of Florence Nightingale*, Vol. 5 (edited by Lynn McDonald). Waterloo, Ontario: Wilfrid Laurier University Press.
- Nordon, Pierre. 1967. *Conan Doyle: A Biography* (translated by Frances Partridge). New York: Holt, Rinehart and Winston.

- Novillo-Corvalán, Patricia. 2015. 'Explorers of the human brain: the neurological insights of Borges and Ramón y Cajal'. In *Latin American and Iberian Perspectives on Literature and Medicine* (edited by Patricia Novillo-Corvalán). New York: Routledge, 2015, pp. 23–44.
- O'Brien, James. 2013. *The Scientific Sherlock Holmes: Cracking the Case with Science & Forensics*. New York: Oxford University Press.
- O'Connor, D.J. 1985. 'Science, literature, and self-censorship: Ramón y Cajal's *Cuentos de Vacaciones* (1905)'. *Ideologies and Literature* 1(3): 98–122.
- Ogden, Emily. 2012. 'Mesmer's demon: fiction, falsehood, and the mechanical imagination'. *Early American Literature* 47(1): 143–70.
- Oschman, James L. 2016. *Energy Medicine, The Energy Basis*, 2nd edition. Edinburgh: Churchill Livingstone.
- Otis, Laura. 1994. *Organic Memory: History and the Body in the Late Nineteenth and Early Twentieth Centuries*. Lincoln, NE: University of Nebraska Press.
- Otis, Laura. 1999. *Membranes: Metaphors of Invasion in Nineteenth-century Literature, Science, and Politics*. Baltimore, MD: Johns Hopkins University Press.
- Otis, Laura. 2001. Introduction. In Ramón y Cajal, Santiago, 2001 (1905). *Vacation Stories* (translated by Laura Otis). Urbana and Chicago, IL: University of Illinois Press.
- Otis, Laura. 2011. *Networking: Communicating with Bodies and Machines in the Nineteenth Century*. Ann Arbor, MI: University of Michigan Press.
- Pattie, Frank A. 1956. 'Mesmer's medical dissertation and its debt to Mead's *De Imperio Solis ac Lunae*'. *Journal of the History of Medicine and Allied Sciences* 11(3): 275–87.
- Pattie, Frank A. 1994. *Mesmer and Animal Magnetism: A Chapter in the History of Medicine*. New York: Edmonston.
- Petrain, David E. (translator). 2010. 'An English translation of John William Polidori's (1815) medical dissertation on *oneirodynia* (somnambulism)'. *European Romantic Review* 21(6): 775–88.
- Piccolino, Marco and Wade, Nicholas J. 2012. 'Carlo Matteucci (1811–1868), the "frogs pile", and the Risorgimento of electrophysiology'. *Cortex* 68: 645–6.

- Pintar, Judith and Lynn, Steven Jay. 2008. *Hypnosis: A Brief History*. Chichester: Wiley-Blackwell.
- Poe, Edgar Allan. 1840. 'The Daguerreotype'. *Alexander's Weekly Messenger* 15 January.
- Poe, Edgar Allan. 1844. 'Mesmeric revelation'. *Columbian Magazine* August, 2(2): 67–70. E-version on website of Edgar Allan Poe Society of Baltimore. www.eapoe.org/works/tales/mesmera.htm (accessed 1 March 2016).
- Poe, Edgar Allan. 1900 (1841). *The Murders in the Rue Morgue and Other Stories*. New York: The Readers' League of America.
- Poe, Edgar Allan. 1978. 'A Tale of the Ragged Mountains'. In *The Collected Works of Edgar Allan Poe* (edited by T.O. Mabbott). Cambridge, MA: Harvard University Press, pp. 935–53.
- Polidori, John William. 2016 (1819). 'The Vampyre: A Tale'. In *Horror Tales* (edited by George Cavendish). Tunbridge Wells: Solis Press, pp. 6–35.
- Polzonetti, Pierpaolo. 2002. 'Mesmerizing adultery: "Così Fan Tutte" and the Kornman scandal'. *Cambridge Opera Journal* 14(3): 263–96.
- Porter, Roy. 1993. 'Review: Whewell, the statesman of science'. *New Scientist* 139(1891): 39.
- Porter, Roy. 2001. *Bodies Politic: Disease, Death and Doctors in Britain, 1650–1900*. London: Reaktion Books.
- Postlethwaite, Diana. 1989. 'Mothering and mesmerism in the life of Harriet Martineau'. *Signs* 14(3): 583–609.
- Pratt, Dale J. 2006. *Signs of Science: Literature, Science, and Spanish Modernity since 1868*. West Lafayette, IN: Purdue University Press.
- Pressman, Mark R. and Broughton, Roger. 2015. NREM arousal parasomnias. In *Sleep Medicine: A Comprehensive Guide to its Development, Clinical Milestones and Advances in Treatment* (edited by S. Chokroverty and M. Billiard). New York: Springer, Chapter 44, pp. 375–89.
- Ramón y Cajal, S. 1910. Preface. In *Super-organic Evolution: Nature and the Social Problem* (edited by Enrique Lluria and translated by Rachel Challice and D.H. Lambert). London: Williams & Norgate, pp. vii–xviii.

- Ramón y Cajal, Santiago. 1989 (1917). *Recollections of My Life* (translated by E. Horne Craigie with Juan Cano). Cambridge, MA: MIT Press.
- Ramón y Cajal, Santiago. 1999 (1897). *Advice for a Young Investigator* (translated by N. Swanson and L.W. Swanson). London: MIT Press.
- Ramón y Cajal, Santiago. 2001 (1905). *Vacation Stories* (translated by Laura Otis). Urbana and Chicago, IL: University of Illinois Press.
- Ramón y Cajal, Santiago. 2007 (1889). 'Pains of labour considerably attenuated by hypnotic suggestion'. In Stefanidou, Maria, et al. 'Cajal's brief experimentation with hypnotic suggestion'. *Journal of the History of the Neurosciences: Basic and Clinical Perspectives* 16(4): 351–61.
- Ramón y Cajal, Santiago. 2012 (1921). *Café Chats* (translated by Benjamin Ehrlich). *New England Review* 33(1): 168–82.□
- Rapport, Richard. 2005. *Nerve Endings. The Discovery of the Synapse*. New York: W.W. Norton.
- Reichenbach, Baron von. 1846. *Abstract of Researches on Magnetism and on certain allied subjects, including a supposed new Imponderable, by Baron von Reichenbach* (translated and abridged from the German by William Gregory). London: Taylor & Walton.
- Richardson, Elise. 2013. 'Extraordinary Powers of Perception: Second Sight in Victorian Culture, 1830–1910'. PhD thesis. London: Queen Mary, University of London.
- Rodin, A.E. and Key, J.D. 1992. 'Humanism and values in the medical short stories of Arthur Conan Doyle'. *Southern Medical Journal* 85(5): 528–37.
- Roos, A.M. 2000. 'Luminaries in medicine: Richard Mead, James Gibbs, and solar and lunar effects on the human body in early modern England'. *Bulletin of the History of Medicine* 74(3): 433–57.
- Rosen, G. 1951. 'Romantic medicine: a problem in historical periodization'. *Bulletin of the History of Medicine* 25(2): 149–58.
- Royal College of Physicians. 2005. 'Doctors in society: medical professionalism in a changing world'. *Report of a Working Party of the Royal College of Physicians of London*. London: Royal College of Physicians.

- Ruston, Sharon. 2013. *Creating Romanticism: Case Studies in the Literature, Science and Medicine of the 1790s*. Basingstoke: Palgrave Macmillan.
- Sala, José, Cardeña, Etzel, Holgado, María Carmen, Añez, Cristóbal, Pérez, Pilar, Perrián, Rocío and Capafons, Antonio. 2008. 'The contributions of Ramón y Cajal and other Spanish authors to hypnosis'. *International Journal of Clinical and Experimental Hypnosis* 56(4): 361–72.
- Sandford, Christopher. 2011. *Houdini and Conan Doyle*. London: Gerald Duckworth.
- Schaffer, Simon. 2010. 'The astrological roots of mesmerism'. *Studies in History and Philosophy of Biological and Biomedical Sciences* 41(2): 158–68.
- Secord, James A. 2003. *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of 'Vestiges of The Natural History Of Creation'*. Chicago, IL: University of Chicago Press.
- Senf, Carol A. 1988. *The Vampire in Nineteenth-century English Literature*. Madison, MI: University of Wisconsin Press.
- Shapiro, Fred R. 2006. *The Yale Book of Quotations*. New Haven, CT: Yale University Press.
- Sharp, D. 2012. 'Thomas Wakley (1795–1862): a biographical sketch'. *The Lancet* 379: 1914–21.
- Sherrington, C.S. 1935. Obituary. 'Santiago Ramon y Cajal. 1852–1934'. *Notices of Fellows of the Royal Society* 1(4): 424–41.
- Shorvon, Simon. 2007. 'Fashion and cult in neuroscience—the case of hysteria'. *Brain* 130(12): 3342–8.
- Sosa-Velasco, Alfredo. 2010. *Médicos escritores en España, 1885–1955*. London: Tamesis.
- Stableford, Brian M. 2004. *Historical Dictionary of Science Fiction Literature*. Lanham, MD: Scarecrow Press.
- Stashower, Daniel. 1999. *Teller of Tales: The Life of Arthur Conan Doyle*. New York: Holt.
- Stefanidou, Maria, Solà, Carme, Kouvelas, Elias, del Cerro, Manuel and Triarhou, Lazaros C. 2007. 'Cajal's brief experimentation with hypnotic suggestion'. *Journal of the History of the Neurosciences: Basic and Clinical Perspectives* 16(4): 351–61.

- Stein, Dorothy. 1985. *Ada, A Life and A Legacy*. Cambridge, MA: MIT Press.
- Stephoe, Andrew. 1986. 'Mozart, Mesmer and "Cosi Fan Tutte"'. *Music & Letters* 67(3): 248–55.
- Stiles, Anne, Finger, Stanley and Bulevich, John. 2010. 'Somnambulism and trance states in the works of John William Polidori, author of *The Vampyre*'. *European Romantic Review* 21(6): 789–807.
- Stoker, Bram. 1897. *Dracula*. New York: Country Life Press.
- Stoker, Bram. 1907. 'Sir Arthur Conan Doyle tells of his career and work, his sentiments towards America, and his approaching marriage'. *The World* 28 July. www.arthur-conan-doyle.com/images/c/ce/Interview-conan-doyle-1907-the-world.pdf (accessed 2 March 2016).
- Sutton, Geoffrey. 1981. 'Electric medicine and mesmerism'. *Isis* 72(3): 375–92.
- Swade, Doron. 1991a. 'Building Babbage's dream machine'. *New Scientist* 1775: 37–9.
- Swade, Doron. 1991b. *Charles Babbage and His Calculating Engines*. London: Science Museum.
- Tagg, John. 1988. *The Burden of Representation: Essays on Photographies and Histories*. Amherst, MA: University of Massachusetts Press.
- Tait, Peter Guthrie. 1871. 'Imagination in science'. *Nature* 3 (72): 395.
- Thomas, Ronald R. 1991. 'Making darkness visible'. In *Victorian Literature and the Victorian Visual Imagination* (edited by Carol T. Christ and John O. Jordan). Berkeley, CA: University of California Press.
- Thompson, Terry W. 2015. 'Golf as metaphor in Arthur Conan Doyle's "The Poison Belt"'. *The Explicator* 73(3): 180–2.
- Tischner, Rudolf. 1928. *Franz Anton Mesmer: Leben, Werk, und Wirkungen*. Munich: Verlag der Münchener Drucke, 1928.
- Toole, Betty Alexandra. 1992. *Ada, the Enchantress of Numbers: A Selection from the Letters of Lord Byron's Daughter and Her Description of the First Computer*. Mill Valley, CA: Strawberry Press.
- Tougaw, Jason Daniel. 2006. *Strange Cases: The Medical Case History and the British Novel*. London: Routledge.

- Turing, A.M. 1950. 'Computing machinery and intelligence'. *Mind* LIX(236): 433–60. [Lady Lovelace's Objection p. 450.]
- Tyndall, John. 1870. 'Scientific Use of the Imagination'. London: Longmans, Green, and Co. https://archive.org/details/ldpd_8876862_000 (accessed 10 February 2016).
- US National Library of Medicine, History of Medicine Division. 2002. *Greek Medicine. The Hippocratic Oath* (translated by Michael North). www.nlm.nih.gov/hmd/greek/greek_oath.html (accessed 19 June 2015).
- Van Horn Melton, James. 2003. *Absolutism and the Eighteenth-century Origins of Compulsory Schooling in Prussia and Austria*. Cambridge: Cambridge University Press.
- van Schlun, Betsy. 2007. *Science and the Imagination: Mesmerism, Media, and the Mind in Nineteenth-century English and American Literature*. Vol. 13, *Leipzig Explorations in Literature and Culture*. Berlin: Galda & Wiltch.
- Vergheese, Abraham, Brady, E., Kapur, C.C. and Horwitz, R.I. 2011. 'The bedside evaluation: ritual and reason'. *Annals of Internal Medicine* 155(8): 550–3.
- Vinchon, Jean. 1936. *Mesmer et son secret*. Paris: A. Legrand.
- Wade, Joshua. 2015. 'The professor rises: science, Victorian Viagra, and masculine libido in "The Creeping Man" '. *Clues* 33(1): 82–91.
- Walmsley, D.M. 1967. *Anton Mesmer*. London: Robert Hale.
- Waraich, Manni and Shah, Shailesh. 2017. 'The life and work of Jean-Martin Charcot (1825–1893): "The Napoleon of Neuroses" '. *Journal of the Intensive Care Society* 19(1): 48–9.
- Waterfield, Robin A. 2004. *Hidden Depths: The Story of Hypnosis*. London: Pan Macmillan.
- Weisberger, R. William. 1986. 'Benjamin Franklin: a Masonic enlightener in Paris'. *Pennsylvania History* 53(3): 165–80.
- Williams, Harley. 1954. *Don Quixote of the Microscope: An Interpretation of Santiago Ramón y Cajal*. London: Jonathan Cape.
- Williams, William Carlos. 1967 (1951). 'The practice'. In *The Autobiography of William Carlos Williams*. New York: New Directions, Chapter 54, pp. 356–62.

- Willis, Martin. 2011. *Vision, Science and Literature, 1870–1920: Ocular Horizons*. London: Pickering & Chatto.
- Willis, Martin and Wynne, Catherine (editors). 2006. *Victorian Literary Mesmerism*. Amsterdam: Rodopi.
- Winter, Alison. 1998. *Mesmerized: Powers of Mind in Victorian Britain*. London: University of Chicago Press.
- Wolfart, Christian. 1815. *Erliiuterungen rum Mesmerismus* [*Explanations of Mesmerism*]. Berlin: Nikolaische Buchhandlung.
- Woolley, Benjamin. 1999. *Ada Lovelace: Bride of Science*. London: Pan Books.
- Wyckoff, James. 1975. *Franz Anton Mesmer: Between God and Devil*. Englewood Cliffs, NJ: Prentice-Hall.
- Wynne, Catherine. 2006. 'Arthur Conan Doyle's domestic desires'. In *Victorian Literary Mesmerism* (edited by Martin Willis and Catherine Wynne). Amsterdam: Rodopi, pp. 223–43.

Appendix

Key developments in Mesmer's animal magnetism

Key developments in Mesmer's animal magnetism

Key

■ Early animal magnetism and magnetists

■ Contemporary with Ada Lovelace

■ Contemporary with Ramón y Cajal and Arthur Conan Doyle

