Nausea and Vomiting:
A History of Signs, Symptoms and Sickness in Nineteenth-Century Britain

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CONTENTS

List of Illustrations..... 4
Abbreviations..... 5
Abstract..... 6
Declaration..... 7
Copyright Statement..... 8
Acknowledgements..... 9

Chapter One:
INTRODUCTION
1.1 Introduction..... 10
1.2 A History of Nausea and Vomiting..... 12
1.3 Nausea, Vomiting and Sickness in Historical Literature..... 19
1.4 Approach and Scope..... 36
1.5 Thesis Structure..... 42

Chapter Two:
PHYSIOLOGY AND PATHOLOGY
2.1 Introduction..... 45
2.2 Muscular Mechanisms of Vomiting..... 46
2.3 Reflex Theory and the Excito-Motor Nervous System..... 52
2.4 Diagnosis and Therapeutics..... 62
2.5 Vomiting and Psycho-Physiology..... 73
2.6 Conclusion..... 85

Chapter Three:
VOMITED MATTERS IN CLINICAL DIAGNOSIS
3.1 Introduction..... 87
3.2 The Subjective Interpretation of Symptoms..... 89
3.3 From Qualitative to Quantitative..... 95
3.4 *Sarcina* as Cause or Consequence?..... 107
3.5 Acid, Digestion and Chemical Analysis..... 115
3.6 Conclusion..... 124

Chapter Four:

MORNING SICKNESS

4.1 Introduction..... 126

4.2 Nausea and Vomiting as Signs..... 130

4.3 Healthy or Pathological?..... 137

4.4 The Sick Role..... 145

4.5 *Hyperemesis Gravidarum*..... 152

4.6 Conclusion..... 160

Chapter Five:

SEA-SICKNESS

5.1 Introduction..... 163

5.2 Experiences..... 165

5.3 Self-Medication and Experiments on Board..... 180

5.4 Public Health..... 194

5.5 From Social to Medical Authorities..... 210

5.6 Conclusion..... 219

Chapter Six:

CONCLUSIONS

6.1 Introduction..... 221

6.2 General Findings..... 222

6.3 Further Research..... 228

6.4 Concluding Remarks..... 233

Bibliography..... 235

Word Count: 83803

LIST OF ILLUSTRATIONS

1	The distribution of the pneumogastric nerve	59
2	Effects of stimuli on vomiting	60
3	Habershon's tabulation of the central, local and peripheral causes of spasmodic vomiting	65
4	Beale's image of *sarcina*	97
5	Three vomit samples: healthy, suspected cancer, sarcinous vomiting in a case of dilated stomach	98
6	The woolpack formation of Goodsir's *sarcina*	102
7	Hassall's image of *sarcina*	103
8	Jakob's image of *sarcina*	104
9	'The Interior of a Packet'	169
10	'Scene on board a French steamer from Havre to Honfleur'	172
11	'A black north-east-er and a heavy swell, on the Atlantic. A situation in which human titles and dignities do not appear to the best advantage'	173
12	'Fishing for whiting at Margate'	174
13	'Leaves from an Amateur Log'	181
14	'Steaming it to Margate'	182
15	Levilly's Thalaszone	191
16	Simpson's apparatus for preventing sea-sickness	192
17	Bordin's specification for preventing sea-sickness	193
18	Preventing sea-sickness by machinery	198
19	Attempts to prevent rolling in steam-boats	199
20	Sections through the Bessemer Saloon in still water and with the vessel rolling	202
21	The general appearance of the Bessemer Saloon	204
22	SS *Castalia* before and after conversion to a hospital ship	209

ABBREVIATIONS

BHM	*Bulletin of the History of Medicine*
BMJ	*British Medical Journal*
IJED	*International Journal of Eating Disorders*
ILN	*Illustrated London News*
JHMAS	*Journal of the History of Medicine and Allied Sciences*
JSH	*Journal of Social History*
MTG	*Medical Times and Gazette*
SHM	*Social History of Medicine*
TNA	The National Archives

ABSTRACT

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During the nineteenth century, as today, nausea and vomiting were common signs and symptoms of illness, the interpretation of which contributed to doctors' diagnostic, prognostic and therapeutic choices. At the core of this thesis lies the research question: how did medical understandings and management of nausea and vomiting change in the period 1800-1900? In addition to being signs of bodily disorder, nausea and vomiting constituted an individual, typically non-medicalised experience of sickness. As such, a secondary thesis question is: how were nausea and vomiting experienced, interpreted and responded to by sufferers? These questions are pursued through four key themes: physiology, vomit analysis, morning sickness and sea-sickness. Medical textbooks, journals, hospital case reports, newspapers, letters and diaries are the principal source base.

Throughout the nineteenth century physiological explanations for nausea and vomiting followed a generally reductionist path. In the 1830s Marshall Hall's reflex theory encouraged new perceptions of the nervous mechanisms involved in nausea and vomiting, and helped stimulate their redefinition into local, central and peripheral causes. Changing physiological explanations for nausea and vomiting were also contemporaneous to the growth of microscopy. This thesis draws attention to the interest nineteenth-century practitioners showed in using vomited matters as pathological fluids. This is explored primarily through a case study of *sarcina ventriculi*, a vegetable microorganism discovered in fermenting vomit. Responses to this discovery showed that laboratory techniques were largely inapplicable to everyday occurrences of nausea and vomiting. Consequently, neither the increasing localisation of the causes of vomiting, nor interest in vomited matters as pathological fluids, contributed to specificity in diagnoses or treatments. This research thereby demonstrates the cumulative and overlapping nature of nineteenth-century medical cosmologies – 'bedside', 'hospital' and 'laboratory' – and the continuation of the 'clinical art'.

The histories of morning sickness and sea-sickness contextualise medical understandings of nausea and vomiting in relation to these transient conditions. They bring to the fore perceptions of health and sickness and show that medical theory was often secondary to cultural beliefs and practices. Specifically, this thesis questions the medicalisation of pregnancy during the nineteenth century and uses experiences of sea-sickness to reveal new features of Victorian understandings of the mind-body relationship. This thesis shows that 'feeling sick' (nausea) was arguably as significant to contemporaries as actually 'being sick' (vomiting). It also confirms the complexity and fluidity of taken-for-granted terms such as: 'patient', 'sufferer', 'disease', 'illness' 'sign' and 'symptom', and, of course, 'sick'. Furthermore, it demonstrates the importance to historians of studying everyday, self-limiting illnesses and morbidity.

DECLARATION

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

COPYRIGHT STATEMENT

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CHAPTER ONE:
INTRODUCTION

1.1 Introduction

Nausea and vomiting are prominently associated with a wide range of medical conditions, not least those of the gastrointestinal system. 'Being sick' in this sense has almost certainly been experienced by every person, worldwide, at some point in their lives. During the nineteenth century, as today, nausea and vomiting were common signs and symptoms of illness, the interpretation of which contributed to doctors' diagnostic, prognostic and therapeutic choices. At the core of this thesis lies the research question: how did medical understandings and management of nausea and vomiting change in the period 1800-1900? In addition to being signs of bodily disorder, nausea and vomiting constituted an individual, typically non-medicalised experience of sickness. As such, a secondary thesis question is: how were nausea and vomiting experienced, interpreted and responded to by sufferers?

I have pursued these broad questions through four themes. The first two approach nausea and vomiting most explicitly as signs and symptoms of 'disease', from the perspective of the medical sphere. I do this in two chapters, the first on the history of the physiology of vomiting, and the second on the use of vomited matters in clinical diagnosis. In these chapters I explore the importance of the interpretation of nausea and vomiting in medical thinking and practice. Yet it was a highly problematic task, riddled with complications. Nausea and vomiting straddled concepts in physiology, pathology and therapeutics; they were bodily exhibitions of dysfunction and disorder, but were also, and often simultaneously, responses seen as protecting against illness. To encompass this complexity my approach has been the investigation of changing medical ideas and practices relating to their interpretation as revealed in case reports, medical journals and textbooks. By including cases where nausea and vomiting were considered directly, but also when they were discussed as components of other illnesses, this thesis offers new insights into how signs and symptoms were used in clinical encounters, and contributes to our understanding of nineteenth-century medical cosmologies. In particular, my aim is to shed new light on the impact, or lack thereof, of physiology, and microscopic and chemical analyses on commonly-encountered medical conditions.

Whilst nausea and vomiting were biological events, they were also mental and physical experiences suffered by individuals on a regular basis during the nineteenth century. The second two themes of this thesis focus on nausea and vomiting as they constituted illnesses in and of themselves, *prior* to a medical encounter. I approach this by way of two case studies – morning sickness and sea-sickness.[1] These cases contextualise understandings and practices by investigating how nausea and vomiting were framed medically and socially, and links between these spheres. These two conditions are also interesting because they were transient and self-limiting, and in a real sense were not 'true' pathological conditions, though sufferers, then as now, would often violently disagree! Through these case studies I examine how nausea and vomiting were not just medical tools used by practitioners to form diagnoses; the occurrence of nausea and vomiting affected the body, mind, and shaped sufferers' perception of their well-being. By approaching nausea and vomiting from the perspective of morning sickness and sea-sickness, this thesis enriches our understanding of socio-cultural responses to, and management of, everyday illnesses outside of the medical sphere. As medical history has been dominated by accounts of fatal diseases and mortality, this thesis is different in being about minor conditions and morbidity.

I begin this Introduction by explaining the importance of studying the history of nausea and vomiting, and my selection of these specific signs and symptoms. I also detail why I have chosen four themes (physiology, vomit analysis, morning sickness and sea-sickness) through which to explore 'being sick' in the nineteenth century. I then frame my research within extant secondary literature. This is for the purpose of contextualising my findings within the history of nineteenth-century medicine more broadly, and to map the current historiographical terrain, showing where my research contributes or conflicts. Following this I explain the approach and scope of the thesis. This includes an outline of the sources I have consulted, but also involves my justifications for topics which it has been necessary to exclude. Finally, I lay out the architecture of the thesis in its entirety and indicate the key questions asked in each chapter.

[1] I have employed the terms 'sea-sick' and 'sea-sickness' within this thesis, reflecting the most common nineteenth-century usage. However, 'seasick' and 'seasickness' were also standard.

1.2 A History of Nausea and Vomiting

Why Nausea and Vomiting?

In 2001 the *British Medical Journal* (*BMJ*) published a clinical study conducted by Robin C. Spiller, Professor of Gastroenterology at the University of Nottingham, citing the prevalence of gastrointestinal symptoms in the general population. Spiller found that eight percent report suffering nausea once a month, and three percent once a week. Two percent also report vomiting once a month.[2] Of all the people who experience nausea and vomiting, and the related condition of anorexia, only twenty-five per cent consult their doctors. Yet these patients account for one to two per cent of all consultations. Moreover, Spiller finds that approximately two thirds of these people 'consult because of fear of a serious disease'.[3]

It is clear that nausea and vomiting are common occurrences. They are caused by many things, from simply having eaten and drunk excessively, to being signs of a serious underlying physical or psychological disease. They are interesting biologically because of their connection to many bodily systems, and for the manner in which they demonstrate a linkage of body and mind. Additionally, the use of emetics was once a mainstay of therapeutic regimes and the use of anti-emetics is a major part of many modern treatments, particularly post-operative care and cancer therapies.

Despite their pervasiveness, nausea and vomiting have been neglected by medical historians. The growing genre of histories of disease has been dominated by accounts of acute and epidemic conditions, and latterly more chronic conditions.[4] There are no histories of common, self-limiting conditions. This pattern seems principally due to the way in which contemporary medicine structures knowledge in terms of specific diseases, and also to the nature of sources left by nineteenth-century practitioners and researchers. In the past, as now, doctors rarely published specifically on minor, transitory or self-limiting illnesses; yet such experiences were, and still are, the predominant encounter of ill-health for most people, and vital tools for practitioners.

[2] Spiller R.C., 'Clinical Review. *ABC of the Upper Gastrointestinal Tract*. Anorexia, Nausea, Vomiting, and Pain', *BMJ* (8th December 2001), p. 1354.
[3] Spiller, 'Clinical Review', p. 1354. Two thirds also consult because of the severity of their symptoms.
[4] For an analysis of changing sickness trends see Weindling P., 'From Infectious to Chronic Disease: Changing Patterns of Sickness in the Nineteenth and Twentieth Centuries', in Wear A. (ed.), *Medicine in Society: Historical Essays* (Cambridge: Cambridge University Press, 1992), pp. 303-16.

For instance, writing of vomiting in 1888 Henry Handford (b. 1855), physician to the General Hospital in Nottingham, described the situation which confronted physicians:

> At the present day, in the face of the remarkable advances in our knowledge of pathology and of pathological anatomy, it is almost necessary to apologise for speaking of, and still more for treating symptoms. Still, in beside work, we have to deal largely with symptoms; and I am satisfied that it would tend greatly to render our knowledge not only more accurate, but also more readily available, if we took individual symptoms and traced them in their variations through a series of diseases. This is somewhat of the mental process required in making a diagnosis.[5]

The interpretation of nausea and vomiting for diagnosis was not an exact science, however. In 1886 F.P. Atkinson of Kingston-on-Thames complained that 'there are few disorders which cause more discomfort and distress than those accompanied with incessant attacks of vomiting, and there are few which try more the skill and patience of the practitioner.'[6]

Whilst I am specifically using nausea and vomiting as a lens for the exploration of nineteenth-century sickness, it is clearly important to acknowledge their status as signs and symptoms more generally. Their interpretation by sufferers usually comes first. As noted by Spiller, a key decision for individuals experiencing nausea and vomiting is whether they believe their symptoms are pointing to a serious illness. Furthermore, the importance of signs and symptoms to the work of practitioners hardly needs emphasising. They can encompass a great deal and require extensive interpretation. In a recent *Medical Humanities Companion*, general practitioner Carl-Edvard Rudebeck observes:

> [Signs and symptoms] are about illness. They are those bodily experiences that intrude on life, and are perceived to be abnormal. Still, the causal sense of the concept 'symptom' lies parallel to the experiential one, and thus when discussing symptoms one might

[5] Handford H., 'Vomiting as a Symptom', *Provincial Medical Journal (Leicester)* (1st December 1888), p. 530.
[6] Atkinson F.P., 'The Treatment of Certain Forms of Vomiting', *Practitioner* (1886) **37**, p. 357.

> refer to anything from a very specific disease symptom to a fleeting sensation in a sensitive person.[7]

He goes on to describe signs and symptoms as simultaneously experiences and indicators of a biological or psychological dysfunction. They can be reported in a doctor-patient interaction, witnessed by medical practitioners in a clinical setting, or identified by the use of modern tests and visualisation techniques such as X-Rays, Magnetic Resonance Imaging (MRI) and electroencephalography (EEG). They are the key indication that an individual might be labouring under an illness, and are a basis for medical decisions. Signs and symptoms also constitute the largest part of a sufferer's experience of health and sickness, and are consistently interpreted by those outside of the medical sphere, including friends and family.

Therefore, symptoms and symptomatology were, and remain, central to medicine and its practice, and experiences of health and illness. As with nausea and vomiting more specifically, signs and symptoms have not been investigated directly by historians. The approach and themes seen in Barbara Duden's work come closest to a model of a history of symptoms. In *The Woman Beneath the Skin*, Duden analyses early-modern cultural constructions of biological and medical terms used to describe healthy and sick bodies.[8] She aims to demonstrate the history of bodily perception, noting a shift in women's concern from physical sensations (*haptic*) to visual change (*optic*).[9] This shift was accompanied by a change in authority over the body; sensations were interpreted by the woman herself, visual occurrences by an outside observer. It is their multi-natured role as sensations, symptoms and sicknesses, open to interpretation from multiple perspectives, that make analysis of nausea and vomiting so rewarding for nineteenth-century medical history.

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[7] Rudebeck C., 'The Body as Lived Experience in Health and Disease', in Evans M. et al. (eds), *Medical Humanities Companion, Volume One: Symptom* (Abingdon: Radcliffe, 2008), p. 36. Rudebeck is a GP and Professor in the Institute for Community Medicine, Tromsö University, Norway.

[8] Duden B., *The Woman Beneath the Skin: A Doctor's Patients in Eighteenth-Century Germany*, Dunlop T. (trans.) (Cambridge, Massachusetts: Harvard University Press, 1991).

[9] For more on Duden's work on perceptions of the body see Hull I.V., 'The Body as Historical Experience: Review of Recent Works by Barbara Duden', *Central European History* (1995) **28:1**, pp. 73-9.

Physiology and Vomit Analysis

Nausea and vomiting were, and are, such prevalent signs and symptoms of illness that it has only been possible within the space of this thesis to investigate selected areas, though I hope to show the potential of this topic and my approach for medical historians. I have chosen to centre on two fundamental medical themes: physiology and vomit analysis.

There are three key reasons for these choices. Firstly, these topics reflect popular nineteenth-century medical interests, as evidenced within primary literature. Secondly, these chapters serve to provide a narrative of how nausea and vomiting were understood and responded to in the entirety of the clinical encounter, through diagnosis, prognosis, and therapeutic decisions. Thirdly, they provide a thorough, contextual framework for analysis of the case studies. Each theme also has more specific significance and benefits for medical history, as now outlined.

Physiological understandings of nausea and vomiting engage clearly with epistemological changes that have been at the core of the history of modern medicine after 1800, namely the move from humoral disease theories to anatomical specificity. Moreover, they have the benefit of remaining separate from any particular disease. This means my analysis is not restricted according to disease nomenclature or concepts, and aids in complicating these categorised views of historical illness. The history of the physiology of nausea and vomiting also contributes clearly to our understanding of one aspect of nineteenth-century medical thought which has proven popular amongst historians. 'The evolution of the concept of reflex activity' has, according to Edwin Clarke and Stephen Jacyna, 'received more attention from writers than any other topic in the history of the neurosciences.'[10] Despite being intricately tied to nervous irritation, however, vomiting has not featured in its history. By addressing this absence, histories of reflex theory, particularly its practical applications to medicine, will be enriched. The physiology of nausea and vomiting was also specifically chosen as the basis for a chapter to support an analysis of vomiting as a therapy; the use of emetics is recognised as continuing late into the nineteenth century, but justifications for it beyond the humoral have not been investigated.

[10] Clarke E. and Jacyna L.S., *Nineteenth-Century Origins of Neuroscientific Concepts* (Berkeley: University of California Press, 1987), p. 101.

Vomit analysis was chosen as a theme as it clearly reflects nineteenth-century physicians' interests in specific disease causation theories, such as changes in tissues, chemical toxicology and, latterly, bacteriology. Vomit itself, however, was also significant for its many contemporary meanings. In James Whorton's *Inner Hygiene* he writes that:

> Both medical and lay respect for the beneficent agents of the external world have been paralleled […] by anxiety about the internal world. The body also surrounds an environment – the alimentary canal – that harbors materials that can seem every bit as threatening as outer agents seem helpful.[11]

Pathological and putrefying fluids claimed much attention in Victorian medicine as products of decomposition that were 'repulsive to the senses and which were thought to be dangerous to health'.[12] The word 'vomit' was an analogy frequently '[a]pplied with contemptuous force to persons or things of a vile, loathsome, or disgusting character.'[13] In fact 'vomit' had multiple meanings in medical language; it was also the word given to an emetic (*a* vomit) and the action to which the patient was subjected (practitioners would vomit their patients). Vomit itself (or the matter ejected) was the physical essence of the action, constituting the materials expelled from the body, presenting those witnessing the action with a visually foul and odorous substance. It was a vehicle by which the 'internal world' of the body was presented to the outside world, making it possible for practitioners to readily observe illness on a physical level and to investigate the body's physiology.

The use of vomited matters in clinical diagnosis, whether qualitative or quantitative, has not previously been explored. As pathological fluids similar to blood, sputum and urine, which have received some historical investigation, their absence from clinical and laboratory histories is surprising.[14] Exploring their role in diagnosis, and in envisioning pathology, is beneficial for understanding how newly introduced technologies and

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[11] Whorton J.C., *Inner Hygiene: Constipation and the Pursuit of Health in Modern Society* (Oxford: Oxford University Press, 2000), p. x.
[12] Hamlin C., 'Providence and Putrefaction: Victorian Sanitarians and the Natural Theology of Health and Disease', *Victorian Studies* (1985) **28:3**, p. 381, quote from footnote 2.
[13] 'vomit, n.', *Oxford English Dictionary Online* [http://www.oed.com/view/Entry/224627; accessed 17th October 2011].
[14] For more see Jacyna L.S., '"A Host of Experienced Microscopists": The Establishment of Histology in Nineteenth-Century Edinburgh', *BHM* (2001) **75:2**, pp. 225-53, and Maulitz R.C., *Morbid Appearances: The Anatomy of Pathology in the Early Nineteenth Century* (Cambridge: Cambridge University Press, 1987).

techniques, such as chemical analysis, were used practically in doctors' approaches to everyday illnesses.

Morning Sickness and Sea-Sickness

Physiological, diagnostic and therapeutic understandings are central to a medical history of nausea and vomiting. However, nausea and vomiting were also a key part of social experiences of ill-health. The close linguistic connection between vomiting and sickness – the terms 'to be sick' and 'to vomit' are often interchanged – made these symptoms an ideal starting point for an analysis of health and illness. My case studies of morning sickness and sea-sickness were primarily defined by nausea and vomiting. Perhaps due to their transient, self-limiting character, they have received little historiographic attention. Yet these conditions were engrained in nineteenth-century society and culture. These case studies serve to compare and contrast the varying understandings and responses which resulted from both medical and lay interest in nausea and vomiting.

Nausea and vomiting during pregnancy attracts a great deal of attention in current medical literature.[15] It is accepted by endocrinology and obstetric specialists that despite affecting fifty to ninety per cent of women 'the underlying pathophysiology is poorly understood' and that 'a combination of genetic, endocrine, gastrointestinal, environmental, and psychosocial factors' may all have a role.[16] Whilst generally believed to be harmless, it can develop to such a degree as to result in damage to maternal and foetal health.[17] The situation today mirrors that of the nineteenth century. It is reasonable to assume that its incidence in society would have been similar, and its prevalence is an important factor for its inclusion in this thesis. In addition, nineteenth-century morning sickness was engrained in both ideas of bodily irritation and cultural beliefs. As such this case study was selected to gain insight into the differing medical and cultural framings of nausea and vomiting. It also addresses a gap in the history of women's health by looking at everyday encounters with illness, and nuances interpretations of the medicalisation of pregnancy that have not taken these common experiences into account.

[15] A simple search of the *BMJ* online using the terms 'Nausea and Vomiting' makes this clear.
[16] Jarvis S. and Nelson-Piercy C., 'Clinical Review. Management of Nausea and Vomiting in Pregnancy', *BMJ* (17th June 2011), p. 342.
[17] Jarvis and Nelson-Piercy cite the incidence of this at less than one per cent.

Unlike morning sickness, sea-sickness passes the gender boundary. Whether regarded as a disease, a disorder, or simply an inconvenience, it is well known by anyone who has either experienced it or been in the presence of a sufferer. It is perhaps the illness most intricately related to nausea and vomiting; that the word 'nausea' comes from the Greek word for 'ship' suggests both an enduring recognition of the condition and specific linkage of nausea, or queasiness, with vomiting. In the transport-abundant society of today sea-sickness forms just part of the wider concern known as motion sickness, a condition 'intimately linked with man's technological efforts to improve and extend his natural powers of locomotion.'[18] In the nineteenth century it presented amongst a variety of social and professional groups including sailors, emigrants, convicts, whalers, doctors (as sufferers themselves and as ships' physicians) and travellers.

The distressing impact of nausea and vomiting as they occurred at sea is clear. In 1872 the following description was published in Charles Dickens's (1812-70) *All the Year Round*:

> How ill, not a few of us know; so ill that this illness makes us forget every other suffering and every danger. The moral and physical prostration are equally complete. Far from fearing death, we are indifferent to it, wish for it, even pray for it. "Oh do throw me into the sea and drown me!" is not a rare entreaty to escape from despairing victim's lips.[19]

This was not a unique description. Sea-sickness was well reported and recorded by Victorians, and though rarely cited within ship surgeons' journals, it was evidently a common concern and cause of ill-health. The condition obviously occurred *outside* of a hospital setting; its very nature dictates its reliance on specific conditions of time and place, i.e. only on boats/ships and only during the journey itself, largely disappearing when the patient is back on solid-ground.

Modern studies reveal that perhaps only one in every forty illness episodes leads the sufferer to consult a medical practitioner.[20] It is very likely that this figure was even

[18] Reason J.T. and Brand J.J., *Motion Sickness* (London: Academic Press, 1975), p. v.
[19] 'Sea-Sickness', *All the Year Round* (1872) **8**, p. 342.
[20] Jones R., 'Self Care: Important for Health Services and Needing more Research', *BMJ* (4th March 2000), p. 596.

lower in the nineteenth century. Morbidity, however, is much harder to gauge from medical literature than mortality. Historian James C. Riley writes that sickness has been neglected, not due to insignificance, but because:

> On the one hand, sickness is a slippery phenomenon which each of us suspects that everyone else defines somewhat differently. We are also aware of other features of its ambiguity: the difficulties of distinguishing well-ness from sickness; the gradations of sickness which may be important in the degree to which physical sickness limits activity or influences emotions and mood; and the varieties of sickness, which has something different to offer in every phase of the life cycle and to every region of the globe.[21]

Nonetheless, various attempts have been made to study morbidity. Some historians argue that it works in parallel with mortality, as suggested by the experience of physician Gilbert Blane (1794-1834) who reported a ratio of ten to one, morbidity to mortality, during the 1820s.[22] Riley himself refers to the records of employee sick funds and friendly societies, whilst others look at doctors' changing experience of mortality levels.[23] The history of sea-sickness allows me to explore a common aspect of morbidity, not via statistics, but from the experience of suffering nausea and vomiting in the social sphere. Nineteenth-century sufferers frequently shared accounts and remedies in private and public arenas, offering rare insight into experiences and responses to the often overwhelming physical and mental symptoms, yet without the influence of a traditional medical encounter.

1.3 Nausea, Vomiting and Sickness in Historical Literature

As I have already indicated, there exists no secondary literature on the history of nausea and vomiting, despite their prominence as signs and symptoms of illness. There is no entry in the Wellcome Library Catalogue, or in the US Library of Medicine for historical literature on this topic. Rather than a specific field of research, I have

[21] Riley J.C., 'Disease without Death: New Sources for a History of Sickness', *Journal of Interdisciplinary History* (1987) **17:3**, p. 537.
[22] Blane G., *Select Dissertations on Several Subjects of Medical Science* (London: G. and W. Nicol, 1833). See also McKeown T., *The Modern Rise of Population* (London: Edward Arnold, 1976), p. 4, where the mortality rate is seen as the inverse of health.
[23] Riley, 'Disease without Death', pp 540-1; Woods R., 'Physician Heal Thyself: The Health and Mortality of Victorian Doctors', *SHM* (1996) **9**, pp. 1-30; Gorsky M., Harris B. and Hinde A., 'Age, Sickness, and Longevity in the Late Nineteenth and the Early Twentieth Centuries: Evidence from the Hampshire Friendly Society', *Social Science History* (2006) **30:4**, pp. 571-600.

therefore invariably had to consider a wide array of extant literature. To contextualise my study I have found it necessary to follow broad themes across nineteenth-century medicine, yet also quite specific literatures, such as the history of pregnancy.

I have divided the historiographies within which I have predominantly worked into three: the theory and practice of nineteenth-century medicine, sufferer and disease biographies, and case study literature. The history of nausea and vomiting can be situated within each of these broad categories, contributing to them by means of a new approach, or complicating extant views. In this review I outline current literature that has informed my thesis, and indicate where my research departs from accepted ideas.

Nineteenth-Century Medicine: Theory and Practice

Nineteenth-century medicine underwent broadly-recognised epistemological shifts. In *Medicine at the Paris Hospital*, Erwin Ackerknecht drew a distinction between three types of successive, dominant medicine that characterised the nineteenth century: 'bedside', 'hospital' and 'laboratory'.[24] The category which received most historical and sociological research in subsequent years was 'hospital medicine', seen as the origin of modern medicine.[25] Michel Foucault's *The Birth of the Clinic* and Nicholas Jewson's essay on 'The Disappearance of the Sick-Man' are most notable for this.[26] In his analysis of discourse in French hospitals, Foucault emphasises the way in which medical language and concepts shape how we think about phenomena in both societal and biological spheres. In the hospital, bodies were subjected to a 'medical gaze', and the individuality of the patient and their signs and symptoms, upon which 'bedside medicine' had centred, was removed. This was similarly reflected in Jewson's central argument, in which the 'bedside' regime of personal patronage and one-to-one doctor-client interaction was replaced by the 'hospital' regime of state or charity support, with patients seen in an increasingly standardised manner within a hospital setting.[27]

[24] Ackerknecht E.H., *Medicine at the Paris Hospital, 1794-1848* (Baltimore: John Hopkins Press, 1967), p. xi.
[25] Cunningham A. and Williams P., 'Introduction', in Cunningham A. and Williams P. (eds), *The Laboratory Revolution in Medicine* (Cambridge: Cambridge University Press, 1992), p. 2.
[26] Foucault M., *The Birth of the Clinic: An Archaeology of Medical Perception*, Sheridan A.M. (trans.) (London: Tavistock Publications, 1976).
[27] Jewson N.D., 'The Disappearance of the Sick-Man from Medical Cosmology, 1770-1870', *Sociology* (1976) **10**, pp. 225-44 and Fissell M.E., 'The Disappearance of the Patient's Narrative and the Invention of Hospital Medicine', in French R. and Wear A. (eds), *British Medicine in an Age of Reform* (London and New York: Routledge, 1991), pp. 92-109. For more on state and charity support see Waddington K., *Charity and the London Hospitals, 1850-1898* (Woodbridge: The Boydell Press, 2000).

A corresponding change in medicine's content is also identified within these histories. Perceptions of bodily disorder moved in the early nineteenth century from models still influenced by Hippocratic and Galenic explanations of imbalance of the four humors, which had been prominent in 'bedside medicine', to anatomical specificity and distinct clinical entities. These changes came with a distancing of the patient's report of illness (symptoms), increasing use of physical diagnostic techniques (signs) and post mortem examinations.[28] In this setting, medicine was perceived by contemporaries and accepted by historians as more empirical or 'scientific'. A collection of essays edited by Roger French and Andrew Wear, entitled *British Medicine in an Age of Reform*, explore these institutional and theoretical changes. John Harley Warner, for example, attributes these shifts to the impact of the French Revolution on the process of medical analysis, including the promotion of 'scientific' reasoning.[29] Environment and lifestyle were increasingly downgraded as playing a detrimental role in health and illness; disease was conceptualised as a result of specific, organic lesions that were standardised across patients.

The replacement of holistic models with distinct clinical entities was neither immediate nor straightforward. This has been made evident when historians have approached social practices in addition to the outlined cognitive changes. In Charles Rosenberg's contribution to his book *The Therapeutic Revolution*, edited with Morris Vogel, he writes that although the shift to a reductionist view was complete by the end of the nineteenth century, this was paralleled by a continuance of humoral medicine: 'the self-confident empiricism which denied the efficacy of any therapeutic measure not proven efficacious in clinical trials seemed an ideological excess suited to a handful of European academics, not to the realities of practice'.[30] The social context and social relations of medicine retained much of their early nineteenth-century character, especially in encounters outside of the hospital.[31] Rosenberg exemplifies this by referring to the continued significance of 'intake' and 'outgo' for the physician, which

[28] It should be noted that although symptoms and signs were often distinguished in this way, these terms were used interchangeably. Furthermore, at times 'sign' was used to indicate that there was some disorder, and 'symptom' was used to refer to the physical result of that disorder. When terminology is significant for analysis in this thesis, I refer to the manner in which these words are being interpreted.
[29] Warner J.H., 'The Idea of Science in English Medicine: The "Decline of Science" and the Rhetoric of Reform, 1815-45', in French and Wear, *British Medicine in the Age of Reform*, pp. 136-64.
[30] Rosenberg C.E., 'The Therapeutic Revolution: Medicine, Meaning, and Social Change in Nineteenth-Century America', in Vogel M.J. and Rosenberg C.E. (eds), *The Therapeutic Revolution: Essays in the Social History of American Medicine* (Philadelphia: University of Pennsylvania Press, 1979), p. 15.
[31] Ackerknecht E.H., *Therapeutics: From the Primitives to the 20th Century* (New York: Hafner Press, 1973), p. 160.

was partly a result of available diagnostic methods. Treatments were judged by physician, patient and family alike. They therefore had to be transparent, seen to be doing *something* (a physiological reaction that preferably paralleled nature's cures).[32] Throughout the nineteenth century these processes were reframed according to successive dominant theories, and adopted new meanings. For example, holistic therapies were given 'nervous' or physiological rationales.[33] Furthermore, in his work on *The Therapeutic Perspective* Warner identifies a change in practice from the 1860s onwards, partly in the name of new experimental science. This change incorporated a shift from the belief that medicine aimed to restore natural balances, to 'correcting the body's abnormal state by bringing it back in line with fixed norms'.[34]

Whilst in idealised forms of 'hospital medicine' the individuality of the patient was significantly reduced, in 'laboratory medicine' the patient could be removed almost entirely from the clinical frame. Signs and symptoms were less prominent in the diagnostic process; pathological tissues and bodily fluids were used to identify specific material changes and correlated to diseases. As a result of the introduction of new analytical technologies, the identification of diseases could consequently be relocated to the laboratory setting.

Physiological investigations exemplified this change.[35] Although engrained in religio-philosophical concerns and anatomy, and therefore not as much a 'rigorous experimental science' as it was on the Continent according to Gerald Geison, physiology in England developed during the late nineteenth century.[36] The discipline turned to the processes of living bodies, including physiological quantities that could be measured in the clinic. Nervous connections throughout the body, and particularly between body and mind, were also a particular focus for anatomical and physiological investigators.[37] In their study of the *Nineteenth-Century Origins of Neuroscientific*

[32] Rosenberg, 'The Therapeutic Revolution', pp. 7-8.
[33] Worboys M., *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865-1900* (Cambridge: Cambridge University Press, 2000), p. 31.
[34] Warner J.H., *The Therapeutic Perspective: Medical Practice, Knowledge, and Identity in America, 1820-1885* (Cambridge and London: Harvard University Press, 1986), p. 5.
[35] Cunningham and Williams, 'Introduction', p. 3.
[36] Namely antivivisection. Geison G.L., *Michael Foster and the Cambridge School of Physiology: The Scientific Enterprise in Late Victorian Society* (New Jersey: Princeton University Press, 1978), p. 4. For the early nineteenth-century history of physiology, and the role of anatomy in various institutions, see Mazumdar P.M.H., 'Anatomy, Physiology, and Surgery: Physiology Teaching in Early Nineteenth-Century London', *Canadian Bulletin of Medical History* (1987) **4**, pp. 119-43.
[37] Jacyna L.S., 'Somatic Theories of Mind and the Interests of Medicine in Britain, 1850-1879', *Medical History* (1982) **26**, pp. 233-58; Young R.M., *Mind, Brain and Adaptation in the Nineteenth Century:*

Concepts, Clarke and Jacyna explore these changes, with a chapter specifically on reflex theory.[38] They write that the early nineteenth century was a period which 'saw a revolution in the understanding of the structure and function of the nervous system and during it anatomical and physiological ideas that had long been widely accepted were overthrown'.[39] The nervous system assumed a primacy in understandings of disease; according to Clarke and Jacyna there was an intellectual 'conviction that all, or almost all, diseases had their ultimate seat in the nervous system'.[40]

Reflex theory thus became increasingly important in explanations of symptoms, specifically vomiting, from the 1840s onwards. Furthermore, the association of nerve diseases with psychological disorder was prevalent in the late nineteenth century, and psycho-physiology was encompassed within this framework. In this thesis I will explore vomiting without recognisable organic cause, or dependence on central reflexes, as this featured prominently in diagnostic literature. I consider the extent to which understandings of nausea and vomiting were influenced, and themselves shaped, by reflex theory, including the impact that these ideas had on diagnosis.

From the mid nineteenth century the introduction of experimental physiology, cellular pathology and chemical testing into laboratory-based diagnostic processes was usually employed for the identification of the structural changes that characterised specific diseases. In particular, morbid bodily fluids and tissues were a focal point for the biological and causal identification of disease. A pivotal example was the identification of the bacillus causing tuberculosis by Robert Koch (1843-1910) in 1882 and cholera in 1883. As Michael Worboys demonstrates in his work on the 'Bacterial Revolution', however, histories of such high profile diseases skew the evidence against less high-profile diseases, where laboratory diagnosis was rarely practical or adopted.[41] Whilst there can be seen a growing dominance of bacterial germ theory over chemical,

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Cerebral Localization and its Biological Context from Gall to Ferrier (Oxford: Oxford University Press, 1990); Haley B., *The Healthy Body and Victorian Culture* (Cambridge, Massachusetts and London: Harvard University Press, 1978).

[38] Clarke and Jacyna, *Nineteenth-Century Origins*, preface and p.1. Clarke and Jacyna may be criticised for offering a progressivist history in which they locate the origins of contemporary understandings of neurosciences (or which, in their words, 'proved fundamental in the human neurosciences' and laid 'the foundations of modern neuroscience'), though they admit it was their intention to focus on intellectual aspects.

[39] Clarke and Jacyna, *Nineteenth-Century Origins*, p. 1.

[40] Clarke and Jacyna, *Nineteenth-Century Origins*, p. 6.

[41] Worboys M., 'Was there a Bacteriological Revolution in Late Nineteenth-Century Medicine?' *Stud. Hist. Phil. Biol. & Biomedical Sci* (2007) **38**, pp. 20-42.

miasmatic conceptions of disease, improvements in technology to aid laboratory work, and the establishment of professional medical bodies, older methods and theories were not fully replaced.

The narrative of successive replacement of medical cosmologies during the nineteenth century is now largely rejected, in favour of cumulative models where regimes co-existed, not least across different medical settings.[42] My analysis of nausea and vomiting tests this revision and does so in the neglected area of diagnosis. For example, in their study of the *Laboratory Revolution*, Andrew Cunningham and Perry Williams write that '[t]hough microscopy and analytical chemistry had early applications in the area of diagnosis, these were initially techniques that were brought to the bedside, and were therefore more an extension of the clinical approach than laboratory medicine.'[43] In a similar fashion, Jacyna's study of the Glasgow Western Infirmary shows that even at the end of the nineteenth century, clinicians used the laboratory only sporadically as a supplement to bedside techniques.[44] Laboratory workers provided a service and clinicians at the bedside, dealing directly with patients and their symptoms, held a much higher status than pathologists.[45] Furthermore, pathologists' work in the 1870s was predominantly morbid anatomy, with only some looking into the process of disease. The use of vomited matters in clinical diagnosis will be used to examine these points, and the extent to which laboratory-based diagnoses were incorporated into everyday medical practice.

Sufferer and Disease Biographies

Discussions of nineteenth-century nausea and vomiting have occasionally appeared in literature which can broadly be described as biographical. The health and illness of historical characters has appeared in limited forms within biographies of their life and works. It has also been considered in the disputed practice of retrospective diagnosis. One particular strand uses psychoanalysis to understand or explain historical personalities – 'psychohistory' – and has been called by Anna Green and Kathleen

[42] This includes the recognition of continuities between the eighteenth and nineteenth centuries. See Hannaway C. and La Berge A. (eds), *Constructing Paris Medicine* (Amsterdam: Rodopi, 1998).
[43] Cunningham and Williams, 'Introduction', p. 11.
[44] Jacyna L.S., 'The Laboratory and the Clinic: The Impact of Pathology on Surgical Diagnosis in the Glasgow Western Infirmary, 1875-1910', *BHM* (1988) **62:3**, p. 396.
[45] Vernon K., 'Pus, Sewage, Beer and Milk: Microbiology in Britain, 1870-1940', *History of Science* (1990) **28**, pp. 289-325.

Troup, the authors of *The Houses of History*, 'one of the most controversial areas of twentieth-century historiography.'[46] However, whether psychoanalytic or biological, retrospective diagnosis involves bringing individuals, and their signs and symptoms, under the scrutiny of current medical knowledge.

The most publicly debated sufferer amongst historians, psychologists and medical practitioners is Charles Darwin (1809-82), known notoriously to have been inflicted with persistent vomiting, from sea-sickness on the voyage of the *Beagle*, to chronic illness later in life.[47] John Winslow's *Darwin's Victorian Malady* and Ralph Colp's *To Be an Invalid* are early, key examples of this type of medical biographical literature. The authors question the somatic or psychological basis of Darwin's chronic dyspepsia, while theorising about the reality of his medical condition in modern terms. Following a brief history of his illness, Winslow turns specifically to Victorian dyspepsia. The condition, he writes, 'was apparently one of the more common serious disease syndromes recognized by English doctors.'[48] According to his main source, Dr James Clarke (published in 1846), nausea and vomiting were specifically symptoms of nervous dyspepsia, along with vertigo, cramps and clammy perspiration.[49] Winslow pays particular attention to the remedies that Darwin may have been offered, including toxic medications, specifically arsenic. This leads him to conclude that Darwin could have been suffering from chronic poisoning, specifically rejecting psychological explanations for his sickness. However, Colp notes that considering what we know of Darwin's cautiousness and careful observance of medication, he would have recognised that he was being poisoned.[50] Colp also argues that earlier historical works were too entrenched in the biographical strand of 'psychohistory', leading nearly all of them to conclude that Darwin's repressed hostility towards his father caused his illness.[51]

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[46] Green A. and Troup K., *The Houses of History: A Critical Reader in Twentieth-Century History and Theory* (Manchester: Manchester University Press, 1999), p. 59.
[47] Other examples than those discussed here: Hubble D., 'Charles Darwin and Psychotherapy', *Lancet* (30th January 1943), pp. 129-33; Keith A., *Darwin Revalued* (London: Watts, 1955); Pickering G.W., *Creative Malady: Illness in the Lives and Minds of Charles Darwin, Florence Nightingale, Mary Baker Eddy, Sigmund Freud, Marcel Proust, Elizabeth Barrett Browning* (London: George Allen and Unwin, 1974).
[48] Winslow J.H., *Darwin's Victorian Malady: Evidence for its Medically Induced Origin* (Philadelphia: American Philosophical Society, 1971), p. 24.
[49] Dyspepsia was considered to be closely related to hypochondria. Dyspepsia itself also presented different symptoms between individual sufferers and according to each type of dyspepsia (nervous, atonic). Winslow, *Darwin's Victorian Malady*, p. 25.
[50] Colp R., *To Be an Invalid: The Illness of Charles Darwin* (Chicago: University of Chicago Press, 1977), pp. 133-8.
[51] Colp, *To Be an Invalid*, see pp. 122-32 for Colp's opinion on psychoanalytic theories.

Both Winslow and Colp's analyses are largely descriptive. Though on a historical topic, their work is focussed on a static object – Darwin's illness – and they dedicate little time to examination of trends and opinions. More recent authors still adopt this approach; Anthony Campbell and Stephanie Matthews claim to 'reveal' Darwin's illness. The authors progress step-by-step through Darwin's symptoms as if he were a patient in a doctor's consulting room today.[52] Finding the causes of nausea and vomiting is therefore the core aim of these works, rather than asking what nausea and vomiting can tell us of nineteenth-century understandings and responses to sickness, which is the approach I take within this thesis.

Biographical texts tell us little of the meaning of symptoms at the time they were experienced, disregarding the social and cultural environments which shaped their interpretation. In an article 'On the History of Disease Concepts', Adrian Wilson argues that historians have often made our current knowledge of disease timeless concepts.[53] Retrospective diagnosis is an example of this, and most clearly takes current disease models and applies them to illness in the past. Wilson argues that we must be aware of how disease concepts can define both patient and doctor experience; using modern understandings as a starting point, at the very least, clouds historical meaning.[54] We can see acknowledgement of this problem in Janet Browne's contribution to *Science Incarnate*, which looks at Darwin as one of many Victorian scientists who suffered poor health.[55] Browne's aim is to ask: 'How did ill health, celebrity status, and brains interlock in the nineteenth century […] and how did Darwin's very public life of the shawl mesh with Victorian cultural commitments of wider relevance?'[56] Her main argument regards the intellect-body connection, whereby Darwin's 'extraordinarily

[52] They conclude that Darwin was lactose intolerant. Campbell A.K. and Matthews S.B., 'Darwin's Illness Revealed', *Postgraduate Medical Journal* (2005) **81**, pp. 248-51.
[53] Wilson A., 'On the History of Disease Concepts: The Case of Pleurisy', *History of Science* (2000) **38**, pp. 271-319.
[54] Wilson, 'On the History of Disease Concepts', p. 304. Whilst retrospective diagnosis is explicit in this respect, other historical works, particularly biographies of diseases – whereby a disease is traced backwards from its modern, contemporary meaning – were the focus of Wilson's concern.
[55] Often ties in with histories of Victorian invalidism. See Winter A., 'Harriet Martineau and the Reform of the Invalid in Victorian England', *The Historical Journal* (1995) **38:3**, pp. 597-616 and Frawley M.H., *Invalidism and Identity in Nineteenth-Century Britain* (Chicago and London: University of Chicago Press, 2004).
[56] Browne J., 'I Could have Retched All Night: Charles Darwin and His Body', in Lawrence C. and Shapin S. (eds), *Science Incarnate: Historical Embodiments of Natural Knowledge* (Chicago and London: University of Chicago Press), pp. 240-87. His wearing of a shawl was noted to have been an outward sign of Darwin's ill health. See Hubble D., 'The Life of the Shawl', *Lancet* (26th December 1953), pp. 1351-4. For how illness could play a 'defining' role in an individual's life and work see also, for example, Rousseau G.S. and Haycock D.B., 'Coleridge's Choleras: Cholera Morbus, Asiatic Cholera, and Dysentery in Early Nineteenth-Century England', *BHM* (2003) **77**, pp. 298-331.

active life of the mind' was strengthened as it 'emerged out of a determined, and in time heroic, conquering of his inadequate frame.'[57] His illness is not isolated, but his condition is interpreted within a wider medico-social frame. As per Browne's example, in this thesis I have adopted an approach that navigates the problem of retrospective diagnosis and disease concepts by studying nausea and vomiting as signs and symptoms that varied in meaning across time and situation, prior to diagnosis. This means a closer investigation of diagnostic practices and allows us to consider illnesses that were not readily labelled or defined by contemporary doctors.

In addition to the biographies of historical characters, disease biographies have been popular amongst historians. It is within the history of stomach ailments, often ill-defined by contemporaries, that nausea and vomiting have received most, albeit still limited, attention. These histories emerged as part of a move in the 1980s within the history of medicine that shifted focus away from epidemic diseases, towards histories of endemic disease and the genre of disease biographies.[58] Stomach ailments themselves, however, have been marginalised in historical literature, with the exception of a number of essay-length analyses and the recently published book by Ian Miller, *A Modern History of the Stomach*.[59] The histories that were published came about predominantly as a result of Gert Brieger's 1979 declaration that, by studying dyspepsia, he was required to analyse 'people, disease, and emotions'.[60] Brieger was writing in response to George Rosen's assertion that 'by taking the social character of medicine as a point of departure, the history of medicine becomes the history of human societies and their efforts to deal with problems of health and disease.'[61]

The problematic and varying interpretation of nausea and vomiting, alongside a wide host of other stomach-based symptoms, has been indicated by historians of dyspepsia in the nineteenth century. For example, dyspepsia today, Brieger confirms, means

[57] Browne, 'I Could have Retched All Night', p. 252.
[58] See Bryder L., *Below the Magic Mountain: A Social History of Tuberculosis in Twentieth Century Britain* (Oxford: Clarendon Press, 1988); Rothman S.M., *Living in the Shadow of Death: Tuberculosis and the Social Experience of Illness in American History* (New York: BasicBooks, 1994); Smith F.B., *The Retreat of Tuberculosis 1850-1950* (London: Croom Helm, 1988).
[59] Miller I., *A Modern History of the Stomach: Gastric Illness, Medicine and British Society, 1800-1950* (London: Pickering & Chatto Publishers, 2011).
[60] Brieger G.H., 'Dyspepsia: The American Disease? Needs and Opportunities for Research', in Rosenberg C.E. (ed.), *Healing and History: Essays for George Rosen* (New York: Science History Publications, 1979), p. 179.
[61] Rosen G., 'People, Disease, and Emotion: Some Newer Problems for Research in Medical History', *BHM* (1967) **41**, p. 9 cited in Brieger, 'Dyspepsia', p. 179.

'difficulty or derangement of digestion, or simply put, indigestion'.[62] Nineteenth-century dyspepsia, however, meant more than indigestion to both sufferers and medical professionals. It was a disease of civilisation, particularly for Americans. Brieger begins his analysis of dyspepsia by discussing the symptoms most strongly related to 'modern' dyspepsia, for example, fullness, pain in the epigastrium, nausea, vomiting and looseness of bowels. He writes that, 'the supposed causes of dyspepsia, then, are as varied as they are a fascinating indication of what doctors and their patients believed to be inimical to good health'.[63] The close connection between the mind and the intestinal tract meant dyspepsia was frequently attributed to the burdens of modern life. Medical and social trends, however, meant that by the end of the nineteenth century 'there was some sentiment for discarding the term altogether as a pathological entity', being replaced with hypersecretion of acid, hypermotility of the gastrointestinal tract and peptic ulcer disease.[64] Similarly, in his essay on 'Biliousness', Roy Porter concludes that dyspepsia was 'established as one of those diseases of civilisation that so taxed the medical and moral imagination', before the vogue for the 'ulcer' took over.[65]

Porter's work is part of a history of digestion that, after Brieger's article, did not appear again in academic literature until the late 1990s, when a collection of essays were edited by William Bynum and published as *Gastroenterology in Britain*. 'If psychiatry is half of medicine,' Bynum boldly asserts, 'then gastroenterology might lay fair claim to much of the remaining territory'.[66] In his essay on 'The Demon of Dyspepsia', Denis Gibbs argues for its importance due to the sheer number of books published to 'meet a seemingly insatiable Victorian appetite for works on the physiology of digestion'.[67] Gibbs examines William Cullen's (1710-90) emphasis on dyspepsia as a neurosis and the role of 'sympathy' and 'sensibility' in depicting refined emotions as increasing capacity for illness.[68] He also traces physiological experiments and the shift towards organ pathology, identifying them as transforming dyspepsia from a disease of digestion to a collection or variety of certain symptoms.[69] Whilst digestion and dyspepsia are central to a number of the essays in this book, alongside 'nervous' symptoms and

[62] Brieger, 'Dyspepsia', p. 179.
[63] Brieger, 'Dyspepsia', pp. 182-3.
[64] Brieger, 'Dyspepsia', p. 184.
[65] Porter R., 'Biliousness', in Bynum W.F. (ed.), *Gastroenterology in Britain: Historical Essays* (London: Wellcome Institute for the History of Medicine, 1997), p. 23.
[66] Bynum W.F., 'Introduction', in Bynum, *Gastroenterology*, p. 5.
[67] Gibbs D., 'The Demon of Dyspepsia: Some Nineteenth-Century Perceptions of Disordered Digestion', in Bynum, *Gastroenterology*, p. 29.
[68] Gibbs, 'Demon of Dyspepsia', pp. 31-2.
[69] Gibbs, 'Demon of Dyspepsia', p. 36.

diseases, there are no discussions of nausea or vomiting despite their evident centrality. Porter, for example, is explicitly aware of Darwin's concern regarding his vomiting, and Thomas Carlyle's (1795-1881) worry about nausea, but no further investigation is made of their specific significance.[70]

In 1979 Brieger recognised the limitations imposed upon studies of conditions such as dyspepsia, and despite subsequent research, these mostly remain. Firstly, he writes that 'the data are rarely expressed in numbers because the disorder was usually not fatal, not reportable, and was for so long mired in a maze of varying nomenclature'. Secondly, he confirms that popular healthcare guides would also be a valuable source for investigation, but which have not been drawn on.[71] This is evident in Gibb's article, in which he concentrates on textbooks and overarching medical ideas, and in Porter's, who uses famous invalids as a basis for analysis. In this thesis I meet the challenges outlined by Brieger by drawing on a variety of sources, from journals, textbooks, newspaper articles, diaries, and by employing the case studies to demonstrate the co-construction of ordinary, everyday sickness by medicine and society. Furthermore, whilst statistics for the occurrence of conditions can be insightful, they largely assume diagnoses have been based on constant criteria, or developed in a linear fashion, hence, disregarding variations, changes and contestations. My discussions of nausea and vomiting take these contestations into account. I try to meet the challenge of changing nosologies and nomenclature of illnesses by paying particular attention to nausea and vomiting as reported signs and symptoms, prior to diagnosis. Lastly, Wilson argues that by looking at the historical construction of disease concepts based on their modern meanings, 'medical history has strangely overlooked the history of medicine proper'; in this thesis I aim to draw together patient reported symptoms, diagnostic categories, and the formation of illness concepts to meet this deficit.[72]

Case Study Literature

Though actually saying little of nausea and vomiting directly, the history of digestion is useful for contextualising the social and cultural significance of the stomach, from which these signs and symptoms were generally assumed to originate. A similar branch

[70] Porter, 'Biliousness', p. 7 and p. 11.
[71] Brieger, 'Dyspepsia', pp. 184-5.
[72] Wilson, 'On the History of Disease Concepts', p. 306.

of literature focussing on the stomach explicitly links bodily disorder to the mind, Victorian genius in particular. The essays in Ana Carden-Coyne and Christopher Forth's edited work on *Cultures of the Abdomen*, centre on the argument that 'since classical antiquity, physicians have cited the centrality of digestive and excretory processes in maintaining health and morality, and thus the proper functioning of body and mind'.[73] The stomach's privileged role in the definition of a learned man and his social status has been the subject of numerous essays, demonstrating how the stomach was perceived as the seat of disease for civilised man.[74] Moreover, in some recent discussions the stomach and gut have been termed 'the second brain'.[75] In comparison, however, a woman's uterus and nerves were believed by physicians to be the cause of many of her disorders. This is therefore an important belief in the history of morning sickness.

For both sexes, nineteenth-century medicine explained the interactions of mind and body via two types of nervous organisation. The first was 'economic' and constituted a finite supply of energy in the body which, if stimulated or depleted in one area, would lead to exhaustion or excitability in another.[76] The second explanation was 'reflex', and entailed a greater difference in the sympathetic reactions between the sexes. In her study of English gynaecology during the period 1800-1929, Ornella Moscucci writes that

> Gender differences were represented in terms of a different weighting between the controlling and automatic sectors of the nervous system; while the higher intellectual faculties played the dominant role in men, an imbalance of physical over mental events was posited in women. Thus mental derangements such as puerperal mania, epileptic

[73] Carden-Coyne A. and Forth C.E., 'The Belly and Beyond: Body, Self, and Culture in Ancient and Modern Times', in Forth C.E. and Carden-Coyne A. (eds), *Cultures of the Abdomen: Diet, Digestion, and Fat in the Modern World* (Basingstoke: Palgrave Macmillan, 2005), p. 3. See particularly Rousseau G., 'Coleridge's Dreaming Gut: Digestion, Genius, Hypochondria', in Forth and Carden-Coyne, *Cultures of the Abdomen*, pp. 105-26.
[74] Shapin S., 'The Philosopher and the Chicken: On the Dietetics of Disembodied Knowledge', in Lawrence and Shapin, *Science Incarnate*, pp. 21-50; Vila A.C., 'The Philosophe's Stomach: Hedonism, Hypochondria, and the Intellectual in Enlightenment France', in Forth and Carden-Coyne, *Cultures of the Abdomen*, pp. 89-104.
[75] Gershon M.D., *The Second Brain: The Scientific Basis of Gut Instinct and a Groundbreaking New Understanding of Nervous Disorders of the Stomach and Intestines* (New York: Harper Collins, 1998).
[76] Moscucci O., *The Science of Woman: Gynaecology and Gender in England, 1800-1929* (Cambridge: Cambridge University Press, 1990), pp. 104-5.

> convulsions and hysterical phenomena were thought to be common at times of intensified sexual activity such as childbirth.[77]

Historians such as Elaine Showalter in *The Female Malady* and Hilary Marland in *Dangerous Motherhood*, use histories of female insanity, and puerperal insanity in particular, to explore the idea that woman's biological-cycle weakened her constitution, potentially threatening society.[78] By exploring the history of nausea and vomiting during pregnancy I aim to question this picture of excessive or morbid excitability during female periodicity by refocusing attention to everyday illnesses. The history of morning sickness will be situated, therefore, within this extensive historiographical area in particular.

Following Foucault's claims about 'biopower' – one part of which was that control over women was achieved during the nineteenth century on the basis of constructed biological reasoning – there has been much interest in the extent to which biological determinism was actually embraced by Victorians.[79] For instance, several authors for *The Making of the Modern Body*, edited by Catherine Gallagher and Thomas Laqueur, argue that biological determinism emerged from cultural representations of the power of men over women, and was not merely a medical construction.[80] In their study of nineteenth-century menstruation Elaine and English Showalter argue that science and society were co-constituted and that 'scientific knowledge reflects, rather than determines the moral biases of an era'.[81] Anne Digby uses the label 'biological straitjacket' to describe how biological knowledge was used by male doctors – and legitimated by new specialists in gynaecology – to reaffirm these cultural conventions and deny women roles in education and politics.[82]

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[77] Moscucci, *The Science of Woman*, p. 105.
[78] Showalter E., *The Female Malady: Women, Madness, and English Culture, 1830-1980* (London: Virago Press, 1985); Marland H., *Dangerous Motherhood: Insanity and Childbirth in Victorian Britain* (Basingstoke: Palgrave Macmillan, 2004); Loudon I., *The Tragedy of Childbed Fever* (Oxford: Oxford University Press, 2000).
[79] See Foucault M., *The History of Sexuality: The Will to Knowledge*, Hurley R. (trans.) (Harmondsworth: Penguin, 1990) – first published in French in 1976 – and Foucault, *Birth of the Clinic*. Biopower was a product of the medicalisation of social and biological events.
[80] Gallagher C. and Laqueur T. (eds), *The Making of the Modern Body: Sexuality and Society in the Nineteenth Century* (Berkeley, London: University of California Press, 1987).
[81] Showalter E. and Showalter E., 'Victorian Women and Menstruation', *Victorian Studies* (1970) **14:1**, p. 88.
[82] Digby A., 'Women's Biological Straitjacket', in Mendus S. and Rendall J. (eds), *Sexuality and Subordination: Interdisciplinary Studies of Gender in the Nineteenth Century* (London: Routledge, 1989), pp. 192-220. On gynaecology see Moscucci, *The Science of Woman*, p. 2.

A common nineteenth-century claim, for example, was women's necessary restriction at times of biological 'crisis', namely puberty, pregnancy, childbirth and menopause. Women were 'fragile' during both menstruation and pregnancy, thus, they were diseased when they were pregnant, and when they were not.[83] Historians have been intrigued by how men constructed and used this knowledge to assume authority over women's biological lives. In Mary Poovey's article on the 'treatment' of Victorian women with anaesthesia during childbirth, she writes that:

> In naming or treating disease or disorders, medicine was intimately involved in the construction and regulation of norms that theoretically (and more or less actually) had a scientific basis but that also incorporated social assumptions into a vocabulary of physiology.[84]

This is not a novel theory, but echoes the work of Georges Canguilhem, who advocated understanding historical medicine as dependent on 'external processes', tied with 'marvels of the imagination'.[85] In *On the Normal and the Pathological*, Canguilhem presents an idea of disease as that which was situated against the norm.[86]

Historians of women's health often see the construction of norms by medical professionals as entrenched in politics. They have questioned in particular how male practitioners came to gain a monopoly over practice, including their claims to the 'objective' value of science. These arguments have predominantly been based on the moment of childbirth, as it was a clear point of intervention, and biological crisis. In comparison pregnancy, and therefore morning sickness, has received little historical attention. Morning sickness is only mentioned in reference to traditional remedies and its cultural meanings.[87] The history of understandings and responses to the common conditions of nausea and vomiting therefore serves to complicate this picture of 'biopower' and a 'biological straitjacket'. By looking at nausea and vomiting I question

[83] Bullough V. and Voght M., 'Women, Menstruation and Nineteenth-Century Medicine', *BHM* (1973) **47:1**, pp. 66-82; Strange J-M., 'Menstrual Fictions: Languages of Medicine and Menstruation, c. 1850-1930', *Women's History Review* (2000) **9:3**, pp. 607-28; Jordanova L., 'Natural Facts: A Historical Perspective on Science and Sexuality', in MacCormack C.P. and Strathern M. (eds), *Nature, Culture and Gender* (Cambridge: Cambridge University Press, 1980), pp. 42-5.
[84] Poovey M., '"Scenes of an Indelicate Character": The Medical "Treatment" of Victorian Women', *Representations* (1986) **14**, p. 138.
[85] Foucault M., 'Introduction', in Canguilhem G., *On the Normal and the Pathological*, Fawcett C.R. (trans.) (Dordrecht, Holland: D. Reidel Publishing Company, 1978), p. xiii.
[86] Canguilhem, *On the Normal*.
[87] Hanson C., *A Cultural History of Pregnancy: Pregnancy, Medicine and Culture, 1750-2000* (Basingstoke: Palgrave Macmillan, 2004), p. 24.

the assumed or constructed morbidity of women's biological changes, and the role which physicians chose, or were allowed, to play in its control or evaluation.

An analysis of sea-sickness, like morning sickness, is missing from historical literature despite its prominence in primary sources. The only book-length work on the topic comes in the form of a small, humorous and anecdotal text written by an inner ear and motion sickness specialist, and entitled *Heave Ho: My Little Green Book on Seasickness*.[88] In academic literature, however, the condition has been only briefly cited, as earlier mentioned, often in biographical contexts such as the work on Darwin.[89] Surprisingly, there are no historical accounts of the condition in secondary literature relating to the navy, trade vessels, convict, or emigrant ships.[90] However, the history of naval medicine has come about relatively recently and is still sparse. Approaches to it can be broadly divided into two strands. First are professionalisation histories that detail policy, administration and practices relating to the Royal Navy, including the education, training and work of the naval medical service. One such example is the recent edited work by David Boyd Haycock and Sally Archer entitled *Health and Medicine at Sea, 1700-1900.*[91] Naval medicine as part of a process of militarisation has also been a key theme, particularly in modern histories, but the sixteenth to nineteenth centuries have received attention more recently.[92]

Second, there are histories interested in tropical, infectious diseases likely to spread on board ship, or tales of painful and gruesome amputations performed during surgery at war. These histories have sometimes focussed on specific diseases, or are else self-styled as social histories of the environment on board ships.[93] Much extant literature is on scurvy; some research concerned merely with the prevalence of the condition, others

[88] Mazel C., *Heave Ho: My Little Green Book of Seasickness* (Camden, Maine: International Marine, 1992).
[89] See also Haight G.S., *George Eliot & John Chapman, With Chapman's Diaries* (New Haven: Yale University Press, 1940); Poynter F.N.L., 'John Chapman (1821-1894): Publisher, Physician, and Medical Reformer', *JHMAS* (1950) **5:1**, pp. 1-23.
[90] It is notably absent from Lloyd C. (ed.), *The Health of Seamen, Selections from the Works of Dr James Lind, Sir Gilbert Blane and Dr Thomas Trotter* (London: Navy Records Society, 1965) and Hudson G.L. (ed.), *British Military and Naval Medicine, 1600-1830* (Amsterdam, New York: Rodopi, 2007).
[91] Haycock D.B. and Archer S. (eds), *Health and Medicine at Sea, 1700-1900* (Woodbridge: Boydell Press, 2009).
[92] Hudson, *British Military and Naval Medicine*, and Brockliss L., Cardwell J. and Moss M., *Nelson's Surgeon: William Beatty, Naval Medicine, and the Battle of Trafalgar* (Oxford: Oxford University Press, 2005).
[93] For a social history – rather than an administrative history – see McLean D., *Surgeons of the Fleet: The Royal Navy and its Medics from Trafalgar to Jutland* (London: I.B. Tauris, 2010).

with how surgeons' responses to it were tied in with ideas of moral and social order.[94] Few mention that vomiting, according to James Lind (1716-94), was a symptom.[95] Whilst wartime medicine has often been made the focus of maritime histories, emigrant and convict health has also received attention. For example, Katherine Foxhall has used naval medicine as a point of departure to study how disease was understood as an interaction between humans and their environments. Disease was perceived as a test, Foxhall argues, of the fitness of emigrants and convicts for colonising.[96] Furthermore, the journey itself was 'pathological' and provided the time and space in which the nature of diseases could change.[97] Foxhall writes that sea-sickness, alongside anxiety and fatigue, was considered by some naval surgeons to predispose emigrants to disease.[98]

Sea-sickness, when it does appear in literature, receives only a brief and often anecdotal mention. In Joan Druett's *Rough Medicine*, for instance, ethyl oxide is mentioned as an article within the medical chest that could have been useful in remedying sea-sickness.[99] Brian Lavery's edited work about the age of sail, *Shipboard Life and Organisation, 1731-1815*, is one of several volumes produced by the Navy Records Society aimed at the experience of daily routine rather than dramatic events. Lavery notes that in the late eighteenth century, ship surgeon Leonard Gillespie's (1758-1842) description of sea-sickness was 'obviously heartfelt', and suggests that the condition was prominent.[100] The most significant reference is a long quotation from Gillespie's logs of 1788. It indicates the severity of the experience alongside physiological understandings:

> Last night and this morning I was affected with sea sickness as were many besides. I evidently evacuated what I had been eating the preceding day. The consent between brain, stomach and vessels of the

[94] Staniforth M., 'Deficiency Disorder: Evidence of the Occurrence of Scurvy on Convict and Emigrant Ships to Australia 1837-1839', *The Great Circle* (1991) **13**, pp. 119-32; Lawrence C., 'Disciplining Disease: Scurvy, the Navy, and Imperial Expansion, 1750-1825', in Miller D.P. and Reill P.H. (eds), *Visions of Empire: Voyages, Botany and Representations of Nature* (Cambridge: Cambridge University Press, 1996), pp. 80-106.
[95] Lind J.A., *Treatise on Scurvy in Three Parts*, 3rd edn (London: S. Crowder, 1772), p. 375.
[96] Foxhall K., *Disease at Sea: Convicts, Emigrants, Ships and the Ocean in the Voyage to Australia, c. 1830-1860*, Unpublished PhD Thesis (University of Warwick, 2008).
[97] Foxhall focuses on typhus and the issue of quarantine. See Foxhall K., 'Fever, Immigration and Quarantine in New South Wales', *SHM* (2011) **24:3**, pp. 624-42.
[98] Foxhall, 'Fever, Immigration and Quarantine', p. 633.
[99] Druett J., *Rough Medicine: Surgeons at Sea in the Age of Sail* (New York: Routledge, 2000), p. 73. The omission of sea-sickness more generally from Druett's text is notable, given the author's attention to social history.
[100] Lavery B. (ed.), *Shipboard Life and Organisation, 1731-1815* (Aldershot: Ashgate, 1998), p. 485 and p. 490.

> skin in seasickness is remarkable. A vertiginous sensation is first perceived, followed by anxiety and nausea. The face becomes pale, the extremities chilly and the whole surface shrivelled. A few quick motions of the ship produces a straining and vomiting.[101]

Gillespie also goes on to comment on the phenomenon of meeting people who are never sea-sick, who were mostly 'thin, rather delicate habit with a long neck and consumptive make'.[102] These are interesting statements and clearly encourage recognition of the merits involved in a historical investigation of sea-sickness from a cultural and medical perspective.

Robin Haines, in *Doctors at Sea*, alludes to a potentially gender-dependent characteristic to sea-sickness, writing that it 'is a dreadful, debilitating illness, and women, then as now suffered from motion sickness to a greater degree than their husbands, brothers, or sons.'[103] However this statement is questionable even on the basis of the minimal references made to sea-sickness within secondary literature. For instance, in J.D. Aslop's analysis of British imperial medicine prior to 1800 he notes that of the few appearances the *female* body made in medical literature (which was centred on young adult males), it was commented that they were not as prone to sickness.[104] I will explore this surprisingly *un*-gendered nature of sea-sickness during the nineteenth century in Chapter Five, and demonstrate that sea-sickness held a far more prominent position in social experiences of health and medicine at sea than has been suggested.

The only academic study reviewed which dedicates a specific section to the history of sea-sickness is *Motion Sickness*, by James Reason and Joseph Brand, which briefly tracks nineteenth-century physiological explanations.[105] Their work, however, is concerned with modern scientific understandings, including symptoms, causes, and countermeasures. Their historical analysis is limited to an opening chapter on historical perspectives, outlining the dominant explanatory models, which I also examine, and frame within wider theories of the causes of nausea and vomiting.

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[101] Lavery, *Shipboard Life*, p. 498.
[102] Lavery, *Shipboard Life*, p. 498.
[103] Haines R., *Doctors at Sea: Emigrant Voyages to Colonial Australia* (Basingstoke: Palgrave Macmillan, 2005), p. 9.
[104] Alsop J.D., 'Warfare and the Creation of British Imperial Medicine, 1600-1800', in Hudson, *British Military and Naval Medicine*, p. 37.
[105] Reason and Brand, *Motion Sickness.*

1.4 Approach and Scope

Although I have cited a great deal of literature above, and drawn on a number of broad historiographies, an historical analysis of nausea and vomiting, or reference to such an investigation, is entirely absent from each. Despite the significance of signs and symptoms in medical theory and practice in the nineteenth century, the prominence of the stomach in medical and cultural understandings of health, and the constant occurrence of sickness during everyday, common illnesses, nausea and vomiting have been largely ignored. In this thesis I aim to demonstrate how these historiographical areas can be enhanced. Furthermore, this thesis opens up a new area of medical history that has hitherto not been advanced. In this section I set out its approach and sources, as well as discussing the limits of my study.

Approach

Whorton's *Inner Hygiene* acts as a model and inspiration for this thesis. He takes constipation as a topic of study and a context for wider views of health and illness in modern society. Whilst looking at changing medical practice, Whorton explores the meanings behind the centrality of the gut, and how they came to represent wider social concern about poison, its connections to personal and public hygiene, and the development of bacteriology. Popular healthcare literature and dominant medical theories are used alongside cultural and social texts. Similarly, I have endeavoured to understand what shaped medical and cultural interpretations of nausea and vomiting, and the result this had on perceptions of, and responses to, sickness and morbidity.

Theoretically, my case studies have also been informed by work on 'framing disease', which Rosenberg explains as follows:

> Disease is at once a biological event, a generation-specific repertoire of verbal constructs reflecting medicine's intellectual and institutional history, an occasion of a potential legitimation for public policy, an aspect of social role and individual – intrapsychic – identity, a sanction

> for cultural values, and a structuring element in doctor and patient interactions.[106]

This approach has inspired historians and social scientists since the mid 1990s, used either explicitly or to inform research.[107] Rosenberg's approach developed from social constructivism in the history and sociology of science. Social constructionists, according to Ludmilla Jordanova, contend 'that ideas necessarily carry or mediate values, that making and using knowledge cannot be so neatly separated'.[108] Accordingly knowledge has to be validated by the institutions, practices and society in which it is formulated, and is therefore socially constructed. However, 'framing' approaches tend to be 'less programmatically charged' and give a greater role to 'biology' in shaping human choices.[109] Rosenberg argues that social constructionists had focussed too much 'on a handful of culturally resonant diagnoses – hysteria, chlorosis, neurasthenia, and homosexuality, for example – in which a biopathological mechanism is either unproven or unprovable.' I use the case studies of morning sickness and sea-sickness to identify the various social and medical forces that helped structure responses to nausea and vomiting, whilst maintaining that biological experience, independent of social and medical frames, was also significant. The debilitating and distressing effect on physical senses and emotions that nausea and vomiting had were seen independently of diagnoses.

That medicine is not solely within the remit of medical authority, rather that 'it takes two to make a medical encounter', has been much-repeated in recent decades in discussions of the historiography of medicine, and informs this thesis throughout.[110] The idea of writing a 'Medical History from Below' was advocated most directly by Porter in 1985, and aims at establishing a foundation of patient experiences in the field.[111] The idea of 'history from below', however, often assumes that a voice is being given to a

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[106] Rosenberg C.E., 'Framing Disease: Illness, Society, and History', in Rosenberg C.E. and Golden G. (eds), *Framing Disease: Studies in Cultural History* (New Brunswick, New Jersey: Rutgers University Press, 1997), p. xiii.
[107] For example see Packard R.M., *The Making of a Tropical Disease: A Short History of Malaria* (Baltimore: John Hopkins University Press, 2007); Porter R. and Rousseau G.S., *Gout: The Patrician Malady* (New Haven and London: Yale University Press, 1998); Woods A., 'The Construction of an Animal Plague: Foot and Mouth Disease in Nineteenth-Century Britain', *SHM* (2004) **17**, pp. 23-39.
[108] Jordanova L., 'The Social Construction of Medical Knowledge', *SHM* (1995) **8:3**, p. 367.
[109] Rosenberg, 'Framing Disease', p. xv.
[110] Porter R., 'The Patient's View: Doing Medical History from Below', *Theory and Society* (1985) **14:2**, p. 175.
[111] See also Porter R. and Porter D., *In Sickness and in Health: The British Experience, 1650-1850* (London: Fourth Estate, 1988).

marginal or even oppressed group.[112] Indeed, in approaching the history of morning sickness I am particularly aware of how patients come to be labelled as such, namely by the Foucauldian notion of the medical gaze, involving the social construction of pathologies.[113] Yet, I aim to balance this argument by considering how social actors, both women and medical professionals, actively distanced morning sickness from that medical gaze. Furthermore, by including sea-sickness I am able to consider experiences of illnesses that were not governed by the perceptions and language of medicine, being spatially separated from such an authority.

I have made it clear within this thesis that I am exploring nausea and vomiting both as part of a medical encounter, but also as conditions which arise prior to the medical encounter and were managed outside of that encounter. In order to draw a broad distinction between the two sides of this dual nature, I have applied the terms 'sign' and 'symptom' to nausea and vomiting when within the medical perspective of diagnoses, and 'conditions', 'illness', or 'sickness' when they were not necessarily medically-framed. Whilst I recognise that these definitions are somewhat anachronistic, as the meanings behind each changed over time, they have been employed in order to maintain clarity over a wide variety of topics and situations in which nausea and vomiting featured.

Sources

The possibilities for a history of nausea and vomiting were vast; however I approached the topic primarily from a medical perspective for the reasons outlined earlier in this chapter and because of the large base of untapped-primary literature which is available. I used textbooks and journals to identify the range of understandings and treatments, and to examine developments in medical sciences – such as physiology and pathology – that directly affected symptomatology. In addition to medical texts, I used home healthcare manuals, particularly for evidence of morning sickness outside of the clinic. I have intensively mined the resources of the Wellcome Library's history of medicine open-shelves collections on the topics of: clinical medicine, diagnosis, digestive system, gynaecology, naval medicine, obstetrics, physiology, pregnancy and therapeutics. I also used textbooks in Manchester University's John Rylands Library, Leeds University's

[112] Condrau F., 'The Patient's View Meets the Clinical Gaze', *SHM* (2007) **20:3**, pp. 525-40.
[113] Condrau, 'The Patient's View', p. 534.

Brotherton Library and the British Library. The large number of medical journals now available online enabled me to search, via Science Direct and PubMed Central, a wide range of published sources. Journal articles were used to identify points of contention and measure responses to, and uptake of, novel or disputed medical knowledge. They also pointed to other journals, to books and pamphlets, and to therapeutic practices and products.

I used hospital reports to examine practice in relation to theory. I consulted the following hospital reports, held at Manchester University Main Library: Guy's (1836-82), St George's (1866-79), St Bartholomew's (1867-1900), St Thomas's (1875-1916) and Edinburgh (1893-1900). These included case reports noting symptoms, diagnosis and treatment. Many also contained statistics for in-patients. These helped demonstrate how frequently nausea and vomiting became concerning enough to require admittance. Furthermore, I used them to show changing methods of categorising these symptoms, including disease nomenclature where relevant.

A search of a number of national and local British Library newspapers was useful in revealing a selection of patent medicines advertised for morning sickness; *The Illustrated London News* (*ILN*) was particularly valuable for the frequency in which it published on experiences of sea-sickness and responses to popular remedies and preventive methods. Archival resources were used predominantly in the case studies, although I did encounter some expected difficulties researching these. Morning sickness was missing from the majority of women's diaries and letters that I consulted in Liverpool Central Library, John Rylands Special Collections Library, and Wellcome Special Collections.[114] My experience was similar to the difficulties that Julie-Marie Strange found with diary sources in her work on menstruation.[115] Literary sources were of little use; Victorian social norms and mores dictated that in published literary works a condition such as morning sickness was not openly discussed and a close reading of many texts for implications would have been necessary. Due to constraints of the PhD it was not possible to dedicate more time to an analysis of popular literature. Instead the morning sickness chapter is based predominantly on the physician's perspective,

[114] In order to maximise chances of finding morning sickness references I consulted the diaries and letters of women written during the time of their pregnancies and shortly after.
[115] Strange J-M., 'The Assault on Ignorance: Teaching Menstrual Etiquette in English Schools, c. 1920-1960', *SHM* (2001) **14:2**, pp. 247-65; Strange, 'Menstrual Fictions'.

complemented where possible with references to home healthcare manuals, patent medicine advertisements, diaries and letters.

In comparison to morning sickness, sea-sickness was much discussed in the nineteenth century; research at the Liverpool Maritime Museum, The National Archives (TNA) and numerous local archives proved fruitful. Sea-sickness featured greatly in Victorian material culture and literature: it is described in short-stories, letters and is combated by means of small patented apparatus (such as eye masks, found in the Wellcome Library), to Henry Bessemer's ship design (1870s), frequently reported in the *ILN*. I also consulted a selection of Surgeons' Journals and sick lists from convict and emigrant ships (ADM 101, TNA), which have been part of a digitalisation cataloguing project since 2008. It was possible to search using variations of the term 'sea-sickness'. The results were used not to gather statistics of the incidence of the condition, but in order to find examples and details of surgeons' responses to nausea and vomiting on board their ships, and also to gain information about the experience of different types of sufferer.

Exclusions

The subject of this thesis is extensive. Nausea and vomiting occur as signs and symptoms in a great deal of medical conditions, which is proof of their significance for health, illness and medical knowledge and practice. Whilst this has been beneficial in allowing me to establish insights into hitherto un-researched areas, time and source constraints have inevitably restricted the scope of research. The decision for inclusions and exclusions of case studies was made on the basis of two core aims. Firstly, I aimed to investigate illnesses which were constituted most predominantly by nausea and vomiting alone. Secondly, the purpose of the research was to gain insight into the history of *sickness*, in contrast to histories of specific diseases, which have been the almost exclusive concern of historians of medicine. In this sense, I hope to begin a correction where the history of medicine and health considers the ordinary and typical experiences of illness.

One topic that I have not covered, which has arguably the strongest links to a history of nausea and vomiting, is infectious diseases with marked gastrointestinal effects, most notably for the nineteenth century – cholera. The history of epidemics and infectious disease has been widely regarded as useful in acting as a 'tool for social and economic

analysis'; epidemics can be used as 'sampling' devices for accessing 'components of social change'.[116] This is especially true of the nineteenth century, whereby histories of the Victorian era 'are dominated by portrayals of poor living and working conditions in which national epidemics of cholera and smallpox flourished'.[117] Histories of infectious disease have therefore informed our understandings of public health, scientific and medical disease theories, class, and social beliefs. However, there are few *clinical* histories of infections, and with cholera, for example, signs and symptoms are typically cited for graphic effect rather than as subjects for historical investigation. I did undertake research on the signs and symptoms of cholera and its representation as a 'vomiting disease', however it proved to be an artificial approach separating one aspect from many others.

The presence of diarrhoea as a distinguishing symptom, alongside nausea and vomiting, was also a key reason for the exclusion of cholera.[118] I make the same justification for the absence of a case study on food poisoning. Despite being a common illness, with much primary literature and little secondary literature, food poisoning was found to be largely identified by the occurrence of diarrhoea, with nausea and vomiting acting as secondary signs and symptoms. Anne Hardy, for instance, suggests that the history of food poisoning could be effectively tracked by looking at incidences of epidemic diarrhoea.[119]

Including infectious diseases and food poisoning would have taken away from minor, symptomatic, commonly transitory illnesses. This thesis can therefore be seen as part of a trend towards the investigation of typical experiences, exemplified by Porter in 1994

[116] For example Rosenberg C.E., 'Cholera in Nineteenth-Century Europe: A Tool for Social and Economic Analysis', *Comparative Studies in Society and History* (1966) **8:4**, p. 452 and Hays J.N., *The Burdens of Disease: Epidemics and Human Response in Western History* (New Brunswick: Rutgers University Press, 1998).
[117] Condrau F. and Worboys M., 'Second Opinions: Endemics and Infections in Nineteenth-Century Britain', *SHM* (2007) **20:1**, p. 147.
[118] Morris R.J., *Cholera 1832: The Social Response to an Epidemic* (London: Croom Helm, 1976); Pelling M., *Cholera, Fever and English Medicine, 1825-1865* (Oxford: Oxford University Press, 1978); Hardy A., *The Epidemic Streets: Infectious Disease and the Rise of Preventive Medicine, 1856-1900* (Oxford: Clarendon Press, 1993).
[119] Hardy A., 'Food, Hygiene, and the Laboratory. A Short History of Food Poisoning in Britain, circa 1850-1950', *SHM* (1999) **12:2**, p. 297. Rather than poisoning, food safety has been the focus of secondary literature. See for example Waddington K., *The Bovine Scourge: Meat, Tuberculosis and Public Health, 1850-1914* (Woodbridge: The Boydell Press, 2006); Sumner J., 'Retailing Scandal: The Disappearance of Friedrich Accum', in Caleb A.M. (ed.), *(Re)creating Science in Nineteenth-Century Britain* (Newcastle: Cambridge Scholars Publishing, 2007), pp. 32-48; Atkins P.J., 'The Glasgow Case: Meat, Disease and Regulation, 1889-1924', *Agricultural History Review* (2004) **52:2**, pp. 161-82.

when labelling gout as a condition that was neither 'sexy nor sensational', but was nonetheless worthy of investigation.[120]

1.5 Thesis Structure

This thesis is divided into two sections: the first offers medical context for the uses of nausea and vomiting in symptomatology and therapeutics, the second contains case studies. Each chapter is broadly chronological and together they provide a multi-layered insight into the various circumstances in which nausea and vomiting could be encountered.

Historians interested in general nineteenth-century clinical theory and practice will find most use in the first two contextual chapters of this thesis: on physiology (Chapter Two) and quantitative analysis of vomit (Chapter Three). These chapters are multidisciplinary, involving physicians, physiologists, pharmacologists, microscopists and pathologists.

In Chapter Two I investigate the ways in which changes in physiology of vomiting in the nineteenth century followed those of pathology more generally, reflecting a shift from humoral explanations to anatomical specificity. Despite the stomach's perceived centrality in the concept of sickness, the nineteenth century saw a clear redirection of attention away from the locality of the stomach, upwards through the nervous system and brain. In turn the role and use of nausea and vomiting as symptoms began to change, as the original location of irritation was open to interpretation. By the end of the century focus rested on the search for a specific anatomical location, the 'vomiting centre', thought to reside within the medulla oblongata.[121] I question how these changes in physiological models of nausea and vomiting impacted on diagnostic and therapeutic practices. In Chapter Two I also explore the use of emetics and anti-emetics, including experiments conducted to determine how these drugs acted on the body. In so doing I aim to demonstrate how humoral explanations for the benefits of vomiting were reframed in 'nervous' models of illness. Finally, in this chapter I explore growing psychosomatic explanations for nausea and vomiting, and investigate how senses and

[120] Porter R., '"Garrison Lecture": Gout: Framing and Fantasizing Disease', *BHM* (1994) **68:1**, p. 3.
[121] An anatomical structure at the base of the brain stem.

emotions were used as explanations for bodily sickness when no evident physical dysfunction was observable.

I then move from a focus on the body as a whole and specific sites of dysfunction, to the small-scale and microscopic interpretation of vomited matters at the bedside, in the hospital and in the laboratory. As the opportunity for microscopy and chemical analysis techniques to be applied to vomited matters increased, practitioners worked to identify diagnostic significance in their findings. In Chapter Three I focus on the discovery in 1842 of the vegetable organism found in fermenting vomit, s*arcina ventriculi*. I explore the impact that this discovery had on the everyday analysis of vomited matters. This includes an investigation of the subsequent interpretations and experiments that were conducted to determine its pathological significance. I principally question whether nineteenth-century doctors considered *sarcina* to play a causal role in vomiting, or whether it was merely a recognisable organism that aided in distinguishing between different types of vomiting. In so doing I reflect on the use of vomited matters in gaining an objective knowledge of common illnesses, and the role that qualitative interpretative methods played throughout the century.

In Chapter Four I approach the first case study. The history of morning sickness will be of most interest to historians of women's health, both professional (gynaecology and obstetrics) and social (experience of pregnancy). It draws together a number of threads: the history of pregnancy (from its earliest stages), of female diseases, and of the female body in both its normal and altered state. It also helps to demonstrate what doctors and women believed to be 'good health', therefore contributing to understandings of morbidity during the nineteenth century.

Historians of women's health have been preoccupied with two themes: the extent to which biological determinism was embraced by Victorians and male medical authority over women's bodies. I engage with these themes in Chapter Four, in which I examine lay and medical understandings and management of morning sickness. I aim to question varying interpretations of nausea and vomiting during pregnancy, and the meanings which this condition was assigned. This involves an analysis of whether morning sickness was considered a pathological condition, and how nausea and vomiting straddled the borderline of health and illness, being used as positive signs of a healthy pregnancy. Women's highly variable experiences, including how the condition was

suffered without any amelioration or recourse to the medical profession, form part of this chapter. I look at how these experiences complemented or conflicted with fractured ideological attempts of male doctors at asserting the morbidity of the condition. In Chapter Four I also explore the framing of pernicious pregnancy vomiting as a condition in and of itself, named *Hyperemesis Gravidarum*, and the effect this had on perceptions of normal, everyday nausea and vomiting of pregnancy.

Whilst Chapter Four focuses on a particularly private experience of nausea and vomiting, in Chapter Five I look at a very public display of these conditions when they presented as sea-sickness. This chapter will be of most benefit to historians of maritime medicine and those interested in experiences of morbidity during the nineteenth century. Personal experiences form the basis of this chapter; I aim to engage with just how distressing and embarrassing nausea and vomiting were. From sufferers' descriptions of relentless nausea and ship decks saturated with vomit, I explore how the condition permeated a range of experiences, work and travel, including emigrant and convict voyages, whalers and leisure journeys. Sea-sickness was not merely encountered on an individual scale. In this chapter I look at societal-scale responses to this problem, including patented chemical formulas, small size mechanisms, and ship-sized technologies.

I mainly explore nausea and vomiting outside of the medical frame within Chapter Five, however in the final section I investigate the level of medical interest that was given to sea-sickness. Whilst nausea and vomiting as part of an array of health conditions were examined by medical professionals throughout the nineteenth century, I examine how understandings of sea-sickness, as a condition which occurred mainly on the unique environment of ships, corresponded with wider theory and practice. As a restricted condition, occurring during periods of motion, I also question how problematic sea-sickness was considered to be, whether medical professionals urged their involvement, and how this shaped their theoretical explanations.

In Chapter Six I make my final conclusions regarding nausea, vomiting and sickness during the nineteenth century. I also briefly demonstrate how further research could benefit this history, including how the stories of morning sickness and sea-sickness continue into the twentieth century.

CHAPTER TWO:
PHYSIOLOGY AND PATHOLOGY

2.1 Introduction

On 30th March 1847 a letter from 'An Anxious Inquirer' was printed in the *Lancet* in which the author complained that he had 'been waiting for some weeks for one of [the] correspondents to define precisely the meaning and application of the words physiology and pathology.'[1] The question arose, the Anxious Inquirer claimed, predominantly in consequence of a review having been written of Marshall Hall's (1790-1857) *Practical Observations and Suggestions in Medicine* (1846), in which the anonymous reviewer had asked 'who ever heard of the physiology of vomiting?'[2] Physiology, the Inquirer claimed, was synonymous with normal function, yet they expressed concern that a physiological action might simultaneously be classed as a pathological one. Vomiting was used to illustrate this:

> Taking this definition, it appears to me that vomiting may be either an act of pathology or physiology. If it be caused by a foreign substance, as touching the fauces with a feather, it would be physiological; if as a symptom of hydrocephalus, pathological.[3]

This letter raises several issues which I address in this chapter. I explore changing knowledge of the mechanisms and pathogenesis of nausea and vomiting, particularly concentrating on what triggered them, and how this altered their interpretation as signs and symptoms of illness. This analysis involves investigating nausea and vomiting within different areas of science and medicine, including the views of physiologists, physicians and pharmacologists. I approach this subject in broadly thematic sections, demonstrating the shifts from humoral to anatomical explanations of nausea and vomiting, and practitioners' changing focus on fluids, the stomach, the nerves, and finally the mind. I show that a diversity of experiences, opinions and inconclusive experimental evidence meant that there was no closure on the matter and that a complex, even contradictory, picture remained throughout the Victorian era.

[1] An Anxious Inquirer, 'What is Physiology? What is Pathology?' *Lancet* (30th March 1847), p. 319.
[2] Though a reference is not given by An Anxious Inquirer, a review was published earlier in the year that commented: 'The subjects of bloodletting, intestinal irritation, paralysis, the physiology of disease or living pathology, in which Dr. M. Hall stands almost alone, are tersely and ably handled,' which appears likely to have been the review referenced. See 'Reviews', *Lancet* (23rd January 1847), p. 92.
[3] An Anxious Inquirer, 'What is Physiology?' p. 319.

I begin by discussing responses to François Magendie's (1783-1855) experiments on the muscular mechanism of vomiting. Magendie's work engaged with a contemporary debate regarding the role of the stomach in the act of expelling its contents. I then explore how these investigations were quickly overtaken by an interest in the more diagnostically-significant issue of how nausea and vomiting, as pathological conditions, were linked to disorder and dysfunction throughout the body; namely, the role of the reflex function in the nervous system. This entails a close examination of the theory of an excito-motor system as proposed by Marshall Hall, and how this physiological and anatomical construct influenced methods of diagnosis.

Following this investigation of physiology and pathology in diagnostic terms, I illustrate how understandings of both the negative and beneficial effects of emesis shifted away from the early nineteenth-century framework of humors, and came to incorporate newer anatomical and nervous explanations of sickness. I look predominantly at reports of pharmaceutical experiments in the 1860s and 1870s to ascertain how these contributed to discussions of the use of emetics and anti-emetics in therapeutics, particularly focussing on the work of Thomas Lauder Brunton (1844-1916). These discussions further highlight the concepts of pathology and physiology regarding nausea and vomiting, whilst also bringing practical medicine in particular to the fore.

Finally, having moved in this chapter from a concentration on the stomach to the nervous system, in the closing section I reflect on late nineteenth-century debates regarding one specific condition – hysterical vomiting – to exemplify medical interest in the brain, will and emotions as sites involved in the production of nausea and vomiting. Overall, I argue that despite the strong connection between vomiting and the stomach, the practitioner's gaze moved from this local area, throughout the body, and came to settle on the brain as the dominant centre of the origin of vomiting, and hence where doctors should focus methods of prevention and control.

2.2 Muscular Mechanisms of Vomiting

Magendie 'On Vomiting'

In 1844 a house surgeon to the Dumfries and Galloway Royal Infirmary, David Anderson, wrote about the necessity for practitioners to understand the mechanism of

vomiting: 'The importance of the act of vomiting, both as a symptom in disease and as a therapeutical agent, renders a knowledge of the mechanism by which it is effected of the first moment to the physician.'[4] At the time of Anderson's article physiologists were in disagreement about the muscular mechanism of vomiting, and a new interest in a nervous mechanism was developing amongst physiologists and physicians alike. The physiology of vomiting had been the subject of several studies in the late eighteenth and early nineteenth centuries. The eminent French physiologist François Magendie, regarded by historians as 'one of the greatest physiologists of his age', had undertaken his first physiological experiments on swallowing and vomiting in an effort to determine the muscular actions involved in these processes.[5] He claimed that his interest in this subject began when he was only young and teachers had told him that the stomach contracted during vomiting.[6] The inquisitive Magendie decided to perform experiments on an animal to establish evidence of this for himself.

Published in the *Annals of Philosophy* in 1813 for an English-speaking audience, Magendie's 'On Vomiting' had been read to the Imperial Institute of France on 25th January earlier that year. Magendie proposed an explanation of the phenomenon that was seen as a departure from accepted knowledge by a number of well-known members of the audience, including naturalist Georges Cuvier (1769-1832), physician and moral treatment advocate Phillipe Pinel (1745-1826), naturalist Alexander von Humboldt (1769-1859) and Pierre-François Percy (1754-1825). Their report of the lecture stated:

> The memoir treats of a physiological truth which for a century and a half past has been alternately adopted and rejected, acknowledged and denied, established and forgotten, and which M. Magendie has at last founded on proofs so irrefragable that it is completely established, and must henceforth be considered as a point of doctrine beyond the reach of every objection.[7]

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[4] Anderson D., 'On the Mechanism of Vomiting', *The London and Edinburgh Monthly Journal of Medical Science* (1844) **37**, p. 1.
[5] Quote from Clarke E. and Jacyna L.S., *Nineteenth-Century Origins of Neuroscientific Concepts* (Berkeley: University of California Press, 1987), p. 5.
[6] 'Lectures on the Physiology of the Nervous System. Delivered in 1836, in the College of France, by M. Magendie', *Lancet* (19th November 1836), p. 295.
[7] Cuvier G., '*On Vomiting*. Being the Account of a Memoir of M. Magendie on Vomiting, read to the Imperial Institute of France on the 1st March, 1813', *Annals of Philosophy* (1813) **1**, p. 429. Magendie utilised his discovery of the mechanism of vomiting to demonstrate years later the benefit of experiments in rectifying errors in physiological knowledge. See 'Lectures on the Physiology of the Nervous System', pp. 295-6.

According to their report, the 'question which occupied the indefatigable and ingenious author of the memoir' was: 'How is vomiting performed, and what are the means employed by nature for that act, so apt to disturb the health, and in many cases so well adapted to re-establish it?'[8]

Magendie's focus was on two key processes: the first regarding the role of the stomach in vomiting, the second the respiratory action involved. The manner in which he most clearly departed from accepted views, particularly those of Swiss anatomist and physiologist Albrecht von Haller (1708-77), was in his assertion that the stomach was passive during the vomiting process. Magendie claimed that Haller had been misled by motion in the region of the pylorus, at the base of the stomach, which gave the impression that the stomach contracted.[9] He did not consider his argument to be original, rather he saw himself as reviving the seventeenth-century view of Pierre Chirac (1650-1732) who, from observations of the abdominal cavity in a vomiting dog, argued that the stomach's peristaltic action was too weak to have caused any expulsions.[10] Magendie claimed his experiments, also on dogs, demonstrated that rather than the stomach contracting, efforts of the diaphragm and large abdominal muscles were central to the act of vomiting. The Imperial Institute's reporters wrote of their experience of Magendie's experiments:

> During the first experiment, repeated several times upon large dogs, in the abdomen of which an incision had been made large enough to admit two fingers, we perceived that at each strain of the animal our fingers were pressed upon from above by the liver pushed down from the diaphragm, and from below by the intestines which the abdominal muscles pressed.[11]

In addition to these muscular movements, Magendie asserted that a respiratory motion was involved in the process. He noted that the stomach's volume was not diminished during vomiting owing to the fact that it was preceded by an inspiration, which he

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[8] Cuvier, '*On Vomiting*', p. 429.
[9] Magendie F., *An Elementary Compendium of Physiology; for the Use of Students*, Milligan E. (trans.) (Edinburgh: J. Carfare, 1823), p. 233.
[10] Mayo H., *Outlines of Human Physiology*, 2nd edn (London: Burgess and Hill, 1892), p. 162. The reporters on Magendie's memoir point out that the Scottish anatomist and surgeon John Hunter (1728-93) had been teaching the same opinion as Magendie twenty years earlier in his *Observations on Certain Parts of the Animal Œconomy*, 2nd edn (London, 1792). See Cuvier, '*On Vomiting*', pp. 429-31.
[11] Cuvier, '*On Vomiting*', p. 432. The second experiment involved removing the stomach entirely from the body.

claimed to have witnessed. This meant the stomach remained distended enough so as to be compressed by the surrounding muscles.

The reporters wrote of their support of Magendie's view, convinced by his repeated experiments which they were evidently encouraged to participate in. However, despite the President of the Royal Medical and Chirurgical Society referring to Magendie's work upon his death in 1855 as '[h]is beautiful and conclusive observations on the mechanism and causes of vomiting,' his explanation had not gone unchallenged.[12]

Muscular Mechanisms and Marshall Hall

In the late 1820s and early 1830s Marshall Hall proposed a different understanding of the muscular mechanisms of vomiting. Hall was an Edinburgh graduate whose early researches were on the subjects of chemistry, blood loss and diagnosis.[13] Although it is predominantly his work in the neurosciences that has received most attention from historians, Hall's initial work on the process of vomiting began not with a nervous explanation, but a mechanical one. One of his early papers, published in the *Lancet* in 1828, opposed both of the dominant opinions which had divided physiologists – whether vomiting was due to either forcible contraction of the stomach itself, or to the compressions of its surrounding muscles.

In disagreement with Magendie, Hall cited evidence of cases in which, during vomiting, the stomach had actually passed through the diaphragm and into the thorax, or the diaphragm had been paralysed; therefore the stomach was beyond the influence of the compression of these muscles.[14] Furthermore, Hall claimed that if the diaphragm contracted then the inspiration which followed would draw the stomach's ejected fluids into the larynx.[15] Rather than inspiration, he argued that vomiting was a process of expiration. Hall had observed that the larynx was forcibly closed, the thorax moved downwards and the abdomen inwards – all muscles of expiration.[16] That the stomach was filled by air in Magendie's findings was explained by Hall as the larynx having

[12] 'Reports of Societies', *Association Medical Journal* (22nd March 1856), p. 239.
[13] 'Death of Marshall Hall', *Lancet* (15th August 1857), pp. 172-3.
[14] Hall M., 'On the Mechanism of the Act of Vomiting', *Lancet* (9th August 1828), p. 600.
[15] Hall, 'On the Mechanism', p. 600.
[16] Magendie also noticed the larynx closed, yet still believed inspiration to take place before vomiting. Hall M., 'Lectures on the Theory and Practice of Medicine', *Lancet* (21st April 1838), p. 99

already been closed: a last intake of breath had been made, meaning that the air was forced into the oesophagus and stomach.

Hall's argument – that the vomiting process was a joint effort by contraction of the muscles of expiration, not the diaphragm – served as a point of reference for subsequent commentators. A variety of opinions emerged and came to co-exist during the first half of the nineteenth century. In 1842, for instance, Anderson presented his inaugural thesis to the University of Edinburgh's medical faculty on his theory of the mechanism of vomiting, later printed in the *London and Edinburgh Monthly Journal of Medical Science*.[17] Anderson added to Hall's evidence that the inflated veins of the neck and forehead, as well as the frequent 'unloading' of the bronchial tubes during vomiting, further indicated vomiting was an act of expiration.[18] Yet, contrary to Hall, he argued that these muscular efforts did not provide adequate pressure for vomiting, and that the diaphragm must be involved. He suggested that inspiration would not necessarily follow the diaphragm's contraction, as Hall believed, given that the opposing muscular forces of the abdomen would counteract the effect. An antiperistaltic action of the stomach and upper duodenum region was, therefore, also necessary.[19] Hall responded to Anderson's criticisms of his theory in the following edition of the journal. He argued that for the muscles to counteract each other, they must contract to exactly the same degree which was, however, 'not usual in nature's operation'.[20] Yet his argument was not considered to be convincing, and several letters of correspondence between Hall and Anderson were published in subsequent months, with both parties insisting on the validity of their theories.[21]

The muscular mechanism of vomiting remained an openly unresolved matter of contention for decades. Thomas King Chambers (1818-89), a specialist of digestion, wrote in 1867 that vomiting did not involve an antiperistaltic action of the stomach. His evidence was based on the difference between normal peristaltic motion (slow and

[17] Murchison C., 'Case of Communication with the Stomach, through the Abdominal Parietes, produced by Ulceration from External Pressure', *Medical Chirurgical Transactions* (1858) **41**, pp. 48-9.
[18] Anderson, 'On the Mechanism', p. 7.
[19] Anderson, 'On the Mechanism', p. 4.
[20] Hall M., 'Dr Marshall Hall on the Mechanism of Vomiting, in a Letter to Dr Anderson', *The London and Edinburgh Monthly Journal of Medical Science* (1844) **38**, p. 182.
[21] Anderson D., 'Mechanism of Vomiting – Letter from Dr Anderson to Dr Marshall Hall', *The London and Edinburgh Monthly Journal of Medical Science* (1844) **39**, pp. 268-70; Hall M., 'On the Mechanism of Vomiting, by Marshall Hall', *The London and Edinburgh Monthly Journal of Medical Science* (1844) **45**, pp. 813-14; Anderson D., 'Mechanism of Vomiting – Letter from Dr Anderson to Dr Marshall Hall', *The London and Edinburgh Monthly Journal of Medical Science* (1844) **47**, pp. 994-5.

uniform) compared to the 'violent explosive power' of vomiting.[22] Furthermore, William Carpenter (1813-85), a biologist who authored numerous editions of works on physiology, taught in his *Principles of Human Physiology* that the diaphragm was not actively involved in vomiting, but that its passivity may offer a firm surface against which the pressure of the stomach could press.[23] In comparison the much used textbook of a German Professor of Physiology, Gabriel Valentin (1810-83), taught in 1853 that the diaphragm did act in the manner proposed by Anderson.[24] The text had been translated by the English physician and physiologist William Brinton (1823-67), who also had a particular interest in digestion and the gastrointestinal tract, and was thus well regarded. The activity or passivity of the stomach, the original question Magendie aimed to answer, was still undecided; Valentin wrote in 1853 that animals whose stomachs were exterior to the abdominal cavity also vomited.

In addition to numerous animal experiments, physicians made opportunistic investigations into vomiting when confronted with patients who offered the potential to look within the body.[25] Despite this, in the second half of the nineteenth century the issue of the exact role of the stomach and its surrounding muscles in vomiting remained unsettled, with most textbooks adopting Anderson's slightly adapted version of Hall's description.[26] The question of muscular involvement had, however, been superseded by investigations into the neurophysiology of vomiting, which came to frame pathological thinking in new ways, many of which had the potential to inform everyday clinical practice.

Writing of Magendie's 1813 paper, the authors of the report for the Imperial Institute had declared that:

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[22] Chambers T.K., *The Indigestions or Diseases of the Digestive Organs Functionally Treated* (London: John Churchill & Sons, 1867), p. 172. For more on Chambers see 'Obituary. Thomas King Chambers', *BMJ* (31st August 1889), pp. 505-6.
[23] Carpenter W.B., *Principles of Human Physiology*, 5th American from the 4th and enlarged London edn (Philadelphia: Blanchard and Lea, 1853), p. 408.
[24] Valentin G., *A Text Book of Physiology*, Brinton W. (trans.), 3rd German edn (London: Henry Renshaw, 1853), p. 131.
[25] Murchison, 'Case of Communication'.
[26] Pavy F.W., *A Treatise on the Function of Digestion; its Disorders and their Treatments*, 2nd edn (London: John Churchill, 1869), pp. 87-93; Stirling W., 'Report on Physiology', *Journal of Anatomy and Physiology* (9th November 1874), pp. 237-8; Broadbent W.H., 'On the Physiology of the Act of Vomiting', *Practitioner* (1875) **14**, pp. 100-2; Foster M., *A Text Book of Physiology* (London: Macmillan and Co., 1877), pp. 202-4; Chapman J., *Sea-Sickness and How to Prevent It* (London: Trübner and Co., 1868), p. 49. Chapman's chapter on physiology of vomiting was praised in one *BMJ* review for being one of the best aspects of the book. See 'Reviews and Notices', *BMJ* (3rd April 1869), p. 310.

> These experiments prove not only that the stomach is passive in vomiting, they leads us to a more important result, which throws new light upon the nervous energy, that wonderful energy which constitutes the whole of our being, the mysteries of which it is so much our interest to penetrate.[27]

A 'most decisive' experiment conducted by Magendie involved the removal of the stomach from several dogs, replacing them with small hogs' bladders, without preventing vomiting from taking place. The reporters had concluded that this experiment proved the inactivity of the stomach. Moreover, as the emetic administered by Magendie had no stomach upon which to act, it also demonstrated that nervous energy was the 'prime mover of all those movements which produce vomiting'.[28] The reporters commented that this verified the evidence of the French physiologist Julien Jean César Legallois (1770-1814), who had claimed that all bodily motion was produced by nervous energy seated in the brain and spinal marrow. In this vein, during the fourth and fifth decades of the nineteenth century a medical consensus began to grow around Hall's work on the excito-motor system, indicating a shift in perceptions of nausea and vomiting from the stomach to the nervous system, with a clear anatomical focus.

2.3 Reflex Theory and the Excito-Motor Nervous System

Hall's Excito-Motor System

According to Hall '[n]o subject illustrates the special function of the true spinal, or excito-motor system so admirably' as vomiting.[29] It had been by accident that Hall came to investigate motor power and the nervous system. Whilst experimenting on blood circulation Hall had decapitated a triton (sea snail) and divided the body into three portions, the tail end of which continued to move and coil upwards when it was irritated.[30] Whilst his work as a physician and physiologist has been intricately explored by historians, it is the concept of reflex which has, according to Edwin Clarke and

[27] Cuvier, '*On Vomiting'*, p. 436.
[28] Cuvier, '*On Vomiting'*, p. 436.
[29] Hall, 'Lectures on the Theory and Practice of Medicine', p. 98.
[30] 'Death of Marshall Hall', p. 173. Hall first voiced his concept of reflex action on 27th November 1832 during a report to the Zoological Society of London. See Clarke and Jacyna, *Nineteenth-Century Origins*, p. 116.

Stephen Jacyna, 'received more attention from writers than any other topic in the history of the neurosciences'.[31]

The early nineteenth century was marked by investigations into the neuromuscular system. According to a reviewer for the *British and Foreign Medical Review* in 1840, the state of knowledge concerning the functions of the nervous system was thoroughly modern and based predominantly on what had been learned within the previous thirty years.[32] The involvement of nervous energy in bodily disorder had, however, been discussed in the eighteenth century, predominantly in the work of the Edinburgh physician Robert Whytt (1714-66). Whytt proposed the doctrine of sympathy, whereby separate sites of the body were interconnected by 'nerves communicating through a central, unconscious and necessarily acting sentient principle'.[33] The stomach had quickly come to occupy a role as one of the primary sites from which nervous energy could pass through the body and which simultaneously could be affected by peripheral irritations. These connections were a part of the normal physiological state, but were exaggerated at times of illness.[34] Sympathetic actions, such as vomiting, were located in the realm of involuntary motions, which included instinctive defence mechanisms, which for Whytt were directed by a soul or 'sentient principle' that protected the body from harmful stimuli.[35]

Hall's memoir 'On the Reflex Function of the Medulla Oblongata and Medulla Spinalis', was published in *Philosophical Transactions* in 1833. His neurophysiological theory departed from Whytt's doctrine of sympathy by dismissing the intervention of the soul, stating that the process was purely mechanistic.[36] Hall also demonstrated, by

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[31] Clarke and Jacyna, *Nineteenth-Century Origins*, p. 101. For a full biography and more on Hall's work, see Manuel D.E., *Marshall Hall (1790-1857): Science and Medicine in Early Victorian Society* (Amsterdam: Rodopi, 1996).
[32] 'Review', *British and Foreign Medical Review* (1840) **9**, p. 98, cited in Manuel, *Marshall Hall*, p. 235.
[33] French R.K., *Robert Whytt: the Soul, and Medicine* (London: The Wellcome Institute of the History of Medicine, 1969), p. 31.
[34] Clarke and Jacyna, *Nineteenth-Century Origins*, p. 102 and Leys R., 'Background to the Reflex Controversy: William Alison and the Doctrine of Sympathy before Hall', *Studies in the History of Biology* (1980) **4**, p. 7.
[35] Clarke and Jacyna, *Nineteenth-Century Origins*, pp. 104-6; Leys, 'Background to the Reflex Controversy', p. 49. For more on variations of the doctrine of sympathy, as expounded in early physiological and anatomical teaching, see Mazumdar P.M.H., 'Anatomy, Physiology, and Surgery: Physiology Teaching in Early Nineteenth-Century London', *Canadian Bulletin of Medical History* (1987) **4**, pp. 119-43.
[36] Leys, 'Background to the Reflex Controversy', p. 49 and Clarke and Jacyna, *Nineteenth-Century Origins*, p. 117.

removing the brain in one of his experimental animals, that the excito-motor system rested in the spinal cord. Voluntary action, however, remained in the cerebral system.[37]

Movement, equilibrium of the muscles, and the form and action of the orifices and terminations of internal canals were part of the spinal system.[38] These actions were subject to nervous excitement and were termed 'reflex', meaning that the impression made upon certain nerves was reflected along nerves adjacent to, or remote from, the original site of impression, via the medulla oblongata and medulla spinalis. The reflex function was a fourth source of muscular motion, in addition to three that physiologists already recognised: volition, respiration, and irritability. Vomiting was one such reflex action:

> [T]he reflex function is peculiar in being excitable into modes of action not previously subsisting in the animal economy, as in the cases of sneezing, coughing, vomiting, &c. The reflex function also admits being permanently diminished or augmented, and of taking on some other morbid forms.[39]

These actions, vomiting included, were 'familiar' but 'not constant'. Hall thus drew attention to the duality of vomiting – it was at once an involuntary, healthy reflex response to stimuli (irritation of the pharynx), yet it could simultaneously assume a degree of pathology, having the potential to take on morbid forms.

The Pneumogastric Nerve and Vomiting Centre

Hall wrote in 1836 that vomiting was always an excited act and that a number of nerves could be involved. If nerves of the head or face were irritated, then this was transmitted through the trifacial nerve. If there was direct irritation of the stomach the pneumogastric nerve was involved, and for irritation in the intestines or uterus, for example, it was the spinal nerves.[40] The pneumogastric nerve (*Pneumon* – lung, *Gaster* – stomach), according to Hall, was the 'least sentient, and the most purely excitor' of all

[37] Hall M., 'On the Reflex Function of the Medulla Oblongata and Medulla Spinalis', *Philosophical Transactions of the Royal Society of London* (1833) **123**, pp. 635-6.
[38] Hall, 'On the Reflex Function', p. 637.
[39] Hall, 'On the Reflex Function', p. 639.
[40] Hall M., *Lectures on the Nervous System and its Diseases* (Philadelphia: E.L. Carey and A. Hart, 1836), p. 221; Hall, 'Lectures on the Theory and Practice of Medicine', p. 98.

the vertebral nerves, therefore being the internal excito-motor nerve.[41] Respiration, circulation and digestion were thought to be directed and controlled by the pneumogastric. This was later thoroughly investigated by Samuel Osborne Habershon (1825-89), a leading physician at Guy's Hospital with a speciality in anatomy and abdominal diseases, and explained by him during the Lumleian Lectures of 1867.[42] The role of this nerve was easily accepted, as evidenced in the 1836 highly popular health text the *Physiology of Digestion*, written by physician and phrenologist Andrew Combe (1797-1847), a brother of George Combe (1788-1858), founder of the Edinburgh Phrenological Society.[43] He maintained that the pneumogastric nerve conveyed a '*sense* of the state of the stomach' to the brain, and also transmitted the signals from the brain that triggered the muscular motion of its parts, meaning that the nerve was, in fact, 'a compound of two distinct sets of fibres, intimately connected no doubt in structure and in function, but each essentially distinct in its origin, and so far fitted for a peculiar office.'[44]

All excitement, Hall believed, was transmitted to the medulla oblongata, a nervous centre in the lower part of the brain stem, connecting to the spinal cord.[45] Yet this claim of the medulla's involvement in receiving and transmitting the irritation, resulting in contraction of muscles, was not entirely novel. There had been interest in a specific location from which vomiting was regulated during the late eighteenth and early nineteenth centuries. Having accepted that vomiting was an act corresponding to respiration, physiologists began with the assumption that the respiratory centre (believed to be in the medulla) and the vomiting centre were likely to be in close proximity to each other.[46] Such thinking had led Magendie to propose in 1813 that the medulla oblongata was the origin of the mechanisms of vomiting:

> If we consider that the efforts of vomiting are executed by the muscles of respiration, that the nerves of the eighth pair supply the stomach as well as the lungs, and that the disorder of the medulla oblongata in

[41] Hall M., *On the Diseases and Derangements of the Nervous System* (London: H. Baillière, 1841), quote p. xix.
[42] Habershon S.O., 'Lumleian Lectures on the Pathology of the Pneumogastric Nerve', *BMJ* (15th April 1876), p. 465.
[43] Combe G., *The Life and Correspondence of Andrew Combe* (Edinburgh: Maclachlan and Stewart, 1850).
[44] Combe A., *The Physiology of Digestion considered with Relation to the Principles of Dietetics*, 2nd edn (Edinburgh: Maclachlan and Stewart, 1836), pp. 80-1.
[45] Hall, 'Lectures on the Theory and Practice of Medicine', p. 99.
[46] Foster, *A Text Book of Physiology*, p. 203.

> apoplexy occasions vomiting, it will be rendered pretty probable that the efforts of vomiting are situated not far from those of respiration, if they have not the very same position.[47]

The idea that the pneumogastric nerve and medulla played a role in vomiting received much support. It was endorsed in 1843 in Hall's *New Memoir on the Nervous System* in which he reaffirmed his previous findings and illustrated the anatomy of the spinal system. Alternative views were, of course, presented, and also enjoyed support. For instance John Chapman (1821-94), a publisher and physician, claimed in *Sea-Sickness and How to Prevent It* (1868) that the role of the pneumogastric was not as obvious as it appeared to Hall.[48] As evidence Chapman cited experiments conducted on dogs by the anatomist John Reid (1809-49), in which Reid severed the connection between the medulla and the stomach. The result was an apparent increase in the excitability of the stomach, with all food being instantly rejected. He took this to indicate that the stomach could be made to vomit by the effect of substances within it, without the intervention of the medulla. The conclusion he drew was that the pneumogastric nerve was both an excitor and inhibitor of excitement.

Chapman also used his own clinical experience of treating sea-sickness to argue that motor impulses were reflected to the stomach primarily from the spinal cord, not the medulla oblongata. He saw the latter as involved with 'control or co-ordination of the agents more immediately concerned in carrying on [the stomach's] wondrous processes,' such as digestion.[49] All of the muscles of vomiting were, according to Chapman, innervated from the spinal cord. If the medulla was directly involved, then sedating it with ice-bags ought to have prevented sickness, which it did not.[50] Instead Chapman witnessed that ice along the entire spine was more effective in arresting vomiting. This led him to conclude that the nervous centre which was the proximate cause of vomiting was purely spinal, not encephalic. While generally supportive of his work, reviewers of Chapman's book were not completely satisfied with this conclusion.

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[47] Cuvier, '*On Vomiting*', p. 437.
[48] Chapman, *Sea-Sickness,* p. 52.
[49] Chapman, *Sea-Sickness*, p. 53.
[50] Hall had previously asserted that the symptoms of sea-sickness all directed the examiner to the medulla oblongata as the primarily affected part of the nervous system. See Hall M., *On the Neck as a Medical Region, and on Trachelismus; on Hidden Seizures; on Paroxysmal Apoplexy, Paralysis, Mania, Syncope; &c*. (London: J. Mallett, 1849), p. 39.

One wrote that '[t]here is much to be said in favour of this view, but it is by no means absolutely conclusive, as certain difficulties remain which cannot be well explained'.[51]

Herbert L. Borison and S.C. Wang, the physiologists who located the precise vomiting centre during experiments on cats and published as such in 1949, have claimed that the idea of a specific vomiting centre was first suggested by G. Giannuzzi in 1865, and was placed within a strict anatomical region by L.J. Thumas in 1891.[52] From the 1870s onwards the notion of a specific vomiting centre within the medulla was certainly widely discussed in British literature and attention turned towards the question of its precise anatomical location.[53] The well-known physician and pharmacologist Thomas Lauder Brunton was one of three men – alongside German physiologist Moritz Schiff (1823-96) and German physician Julius Ludwig Budge (1811-88) – credited in John Musser's (1856-1912) late nineteenth-century textbook on medical diagnosis as being responsible for the first modern account of the physiology of vomiting. 'From them,' Musser wrote, 'we learn that there is a nervous centre for vomiting, which is seated in the medulla oblongata.'[54]

Brunton was an Edinburgh-educated physician and surgeon who had trained under the German physiologist Carl Ludwig (1816-95). He showed an interest early in his career in the action of drugs and the physiology of digestion, and would experiment by administering drugs not only to laboratory animals, but also to himself and his students.[55] Whilst holding the position of lecturer in materia medica and therapeutics at St Bartholomew's Hospital, Brunton published an article in the *Practitioner* 'On the Physiology of Vomiting and the Action of Anti-Emetics and Emetics' (1874). In this article Brunton described the motor impulses that made the abdominal muscles, the

[51] 'Reviews and Notices', p. 311.
[52] Borison H.L. and Wang S.C., 'Functional Localization of Central Coordinating Mechanism for Emesis in Cat', *Journal of Neurophysiology* (1949) **12**, pp. 305-13. Giannuzzi had specifically been investigating the involvement of the central nervous system in vomiting induced in dogs. Giannuzzi and Thumas cited as Giannuzzi G., 'Untersuchungen über die Organe, welche an dem Brechact theilnehmen, und über die physiologische Wirkung des Tartarus stibiatus', *Zbl. med. Wiss*. (1865) **3**, pp. 1-4, and Thumas L.J., 'Ueber das Brechcentrum und über die WirkungeinigerpharmakologischerMittel auf dasselbe', *Virchows Arch*. (1891) **123**, pp. 44-69.
[53] A simple electronic search of the term 'vomiting centre' finds first references to it in 1880 (*BMJ*) and 1883 (*Lancet*). See for instance Brunton T.L. and Ferrier D., 'Report on the Progress of Physiology', *Journal of Anatomy and Physiology* (1871) **6:1**, p. 242.
[54] Musser J.H., *A Practical Treatise on Medical Diagnosis for Students and Physicians* (Edinburgh and London: Young J. Pentland, 1894), p. 497.
[55] Willius F.A. and Dry T.J., 'Sir Thomas Lauder Brunton (1844-1916)', in Willius F.A. and Dry T.J., *A History of the Heart and the Circulation* (Philadelphia and London: W.B. Saunders Company, 1948), pp. 323-6.

diaphragm and the oesophagus contract. These motor impulses were directed along the pneumogastric nerve and correlated in the nervous centre in the medulla oblongata.[56] Brunton was clear to make the distinction that whilst the vomiting and respiratory centres were likely to be closely connected, they were not identical.[57]

Figures 1 and 2, displayed over the following pages, show the distribution of the pneumogastric nerve between the vomiting and respiratory centres, and the muscles and nerves that Brunton lectured as involved in vomiting. Brunton claimed that irritation affected the stomach in a number of ways. If a mild stimulant irritated the stomach, a sense of this was conveyed between the nerve-centres indicated by the letters A, B, C and D, labelled in Figure 2, and resulted in nausea. If there was a stronger stimulus then a different nerve mechanism was excited (A, E, F, G). If the irritation was increased still further, then the abdominal wall muscles were excited into action, resulting in vomiting (A, H, K, K).

[56] Brunton T.L., 'On the Physiology of Vomiting and the Action of Anti-Emetics and Emetics', *Practitioner* (1874) **13**, p. 412.
[57] Brunton, 'On the Physiology of Vomiting', p. 428.

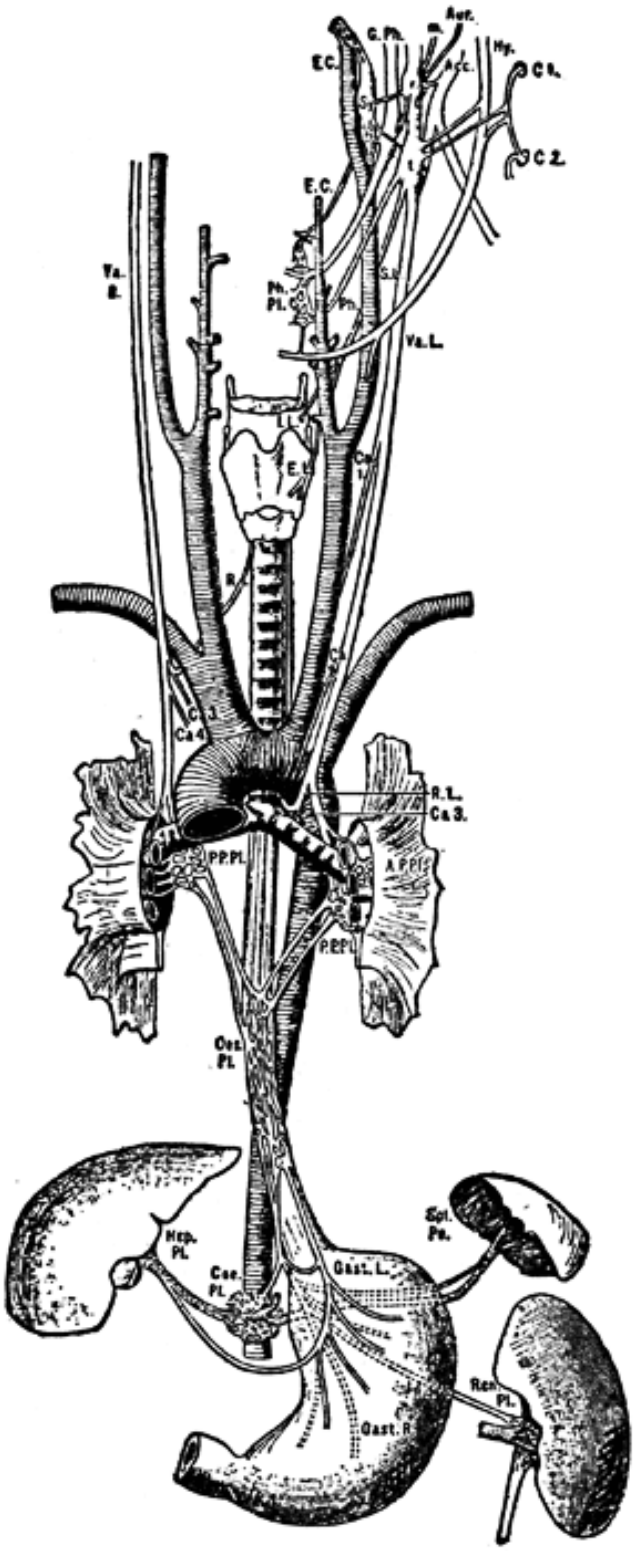

Figure 1. The distribution of the pneumogastric nerve

Source: *The Encyclopedia Britannica,* vol. 11 (New York: The Encyclopedia Britannica, 1911), p. 397.

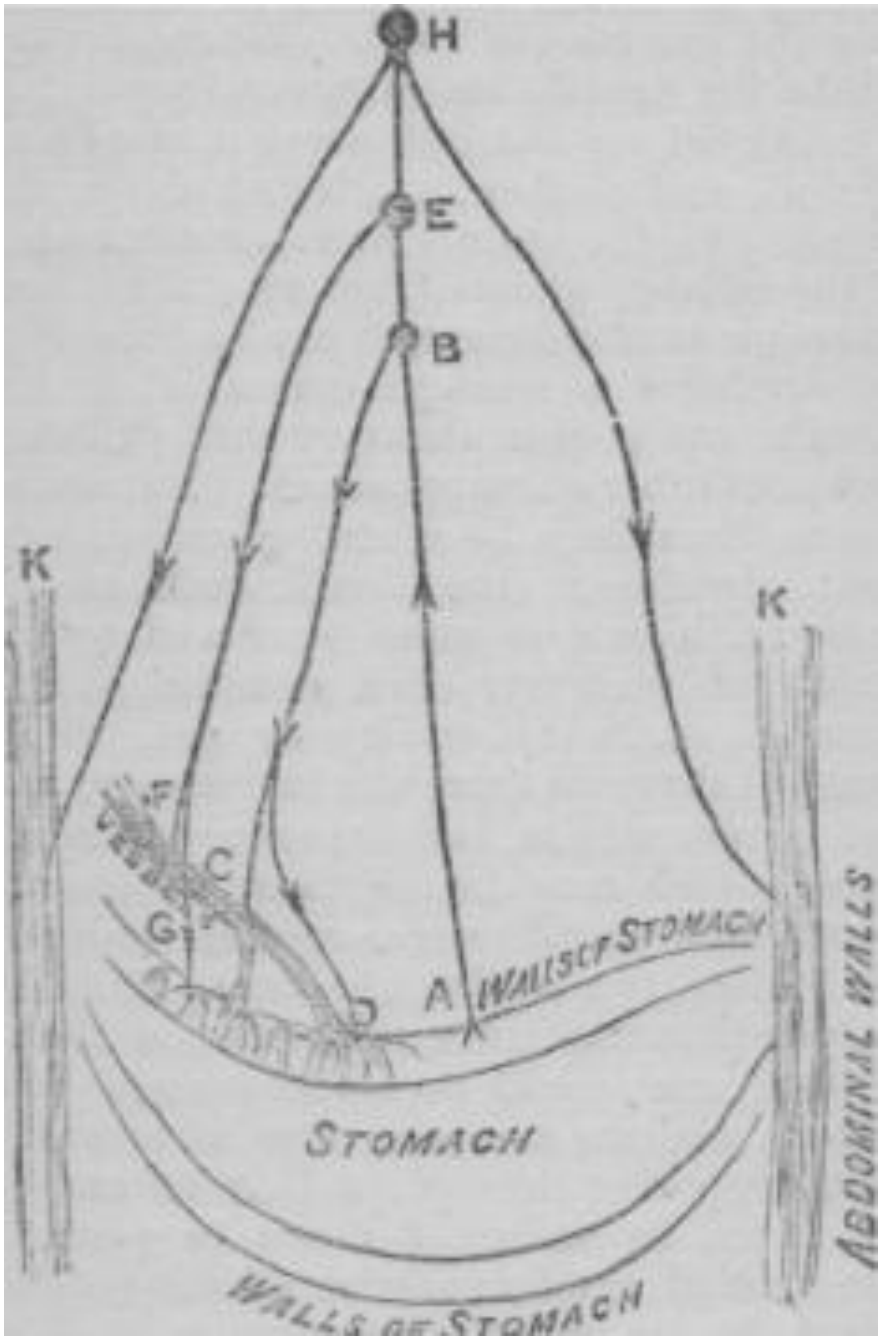

Figure 2. Effects of stimuli on vomiting

Source: Brunton T.L., 'The Goulstonian Lectures on Pharmacology and its Relation to Therapeutics', *BMJ* (7th April 1877), p. 416.

The Physiology of Nausea

Brunton had thus also attempted to explain the physiology of nausea, which had commonly been neglected in favour of explaining the act of vomiting. However, his explanation, as that of many other physiologists, was limited. In his 1894 textbook Musser wrote that '[n]ausea is akin to vomiting in its mechanism and clinical associations'.[58] It was generally considered a result of the same stimulation which eventually led to vomiting. For example, in the Goulstonian Lectures of 1877 Brunton argued a popular opinion that when the stomach was 'violently rubbed, the rosy colour at once disappears, the vessels contract, the membrane becomes pale, and secretion of gastric juice stops, a flow of mucus is produced, and nausea comes on'.[59]

The physiology of nausea had proved much more difficult to produce experimentally than vomiting, not least because it was a state of the mind as well as the body. Nausea, as a feeling or sensation generally occurring around the abdominal region and affecting the head, had no unique physical sign. It was, however, noted by physiologists as accompanied typically by a number of measurable or quantifiable bodily changes (a combination of sensations and outward physical expressions) that together constituted the overall phenomenon. These varied widely. For instance, in contrast to Brunton's description of nausea, Magendie had written in 1823 that: 'it consists of a general uneasiness, with a feeling of dizziness in the head, or in the epigastric region; the lower lip trembles, and the saliva flows in advance.'[60] It was not made clear whether nausea was thought by commentators to be constituted by these physical and sensational changes, or whether it caused them.

Nausea separated vomiting, according to Magendie, from eructations, regurgitations and belching.[61] It was also commonly suggested that the physical conditions accompanying nausea played an active role in assisting vomiting. Michael Foster (1836-1907), a leading British physiologist, wrote in 1877 that vomiting was

> preceded by feelings of nausea, during which a copious flow of saliva into the mouth takes place. This being swallowed carries down with it a

[58] Musser, *A Practical Treatise on Medical Diagnosis*, p. 496.
[59] Brunton T.L., 'The Goulstonian Lectures on Pharmacology and its Relation to Therapeutics', *BMJ* (7th April 1877), p. 415.
[60] Magendie, *An Elementary Compendium*, p. 232.
[61] See also Marsh H., 'On a Peculiar Morbid Affection of the Stomach', *Provincial Medical and Surgical Journal* (August 1843), pp. 409-13.

> certain quantity of air, the presence of which in the stomach, by assisting in the opening of the cardiac sphincter, subsequently facilitates the discharge of the gastric contents.[62]

Nausea was not always, however, merely dismissed as the precursor to vomiting or an encourager of it. Rather, a common early nineteenth-century viewpoint was expressed by John Mason Good (1763-1827), whose four volume work on the *Study of Medicine* was well received during the 1820s. He observed that '[t]here are few persons so debilitated as not to bear vomiting, but many who would sink under nausea.'[63] In Lionel Beale's (1828-1906) *On Slight Ailments* (1880), nausea was described as 'a most unpleasant sensation [...] to experience,' and one which could be considered an ailment in and of itself, 'sometimes being very slight, just a little qualmishness [...] sometimes so severe that the patient feels he must vomit'.[64] Sick-headache, or migraine, was considered an extreme form of headache and associated with nausea and vomiting, described by Beale as 'one of the most severe of the maladies included under the head of slight ailments.'[65] Sick-headaches were seen to be caused by a general derangement of the nervous system. Normal or slight nausea, however, Beale believed was due to the mucous membrane of the stomach or the condition of the liver being deranged, or it was as a result of impeded circulation in the vessels of these sites. Whilst Beale offered a handful of remedies for the relief of nausea, most therapeutic advice during the nineteenth century focussed on the relief of vomiting, and indicated that vomiting itself ended the nauseous sensation.[66]

2.4 Diagnosis and Therapeutics

Reflex Theory in Diagnosis Textbooks

The experiments and theories of Magendie, Hall and Brunton aimed to demonstrate the way the body functioned during the process of vomiting. However, the reporters in Magendie's audience at the Imperial Institute clarified specifically that '[Magendie] has not considered it with reference to medical practice, convinced that in what way soever

[62] Foster, *A Text Book of Physiology*, p. 202.
[63] Good quoted in Warning E., 'Theory of Vomiting', *Lancet* (22nd October 1831), p. 117.
[64] Beale L.S., *On Slight Ailments: Their Nature and Treatment* (London: J. & A. Churchill, 1880), p. 42.
[65] Finlayson J., *Clinical Manual for the Study of Medical Cases* (London: Smith, Elder, & Co., 1878), p. 324; Beale, *On Slight Ailments*, p. 122.
[66] Beale, *On Slight Ailments*, p. 45.

it is produced, its necessity, indications, and effects, must continue the same in cases of disease.'[67] In 1833 Hall, unlike Magendie, posed the question to himself: 'what relation does the reflex function bear to the art of the physic?'[68] Indeed, Clarke and Jacyna write that '[o]ne of the most appealing aspects of Hall's doctrine was undoubtedly his claim that it had application both to the normal and abnormal nervous system'.[69] Certainly Hall believed this to be the case, writing that reflex theory would 'reveal and explain a totally new order of facts in pathology, and lead to a new division of the diseases of the nervous system,' according to their centric or eccentric (remote) origin.[70] Hall's prediction was soon evident in accounts of vomiting.

Hall maintained that diagnosis and therapeutics benefited from a more accurate understanding of signs and symptoms. 'The most perfect knowledge of Symptoms,' he wrote, 'would be utterly useless unless considered as signs and indices of the internal disease'.[71] Vomiting occurred as a result of *abnormal* irritation, it was a physiological event in response to a pathological state. Reflex theory offered the possibility of mapping the symptoms of nausea and vomiting onto a network of potential sites of abnormal irritation, and locating the internal disease. Hall wrote, for example, that '[p]allor, syncope, and sickness, probably depend on shock to the medulla oblongata. They become diagnostic, both of the seat and the severity of the affection.'[72]

Reflex theory was introduced directly and explicitly into the teaching of diagnostic practices.[73] It became standard in diagnosis textbooks during the mid nineteenth century for authors to state that there were very broadly two sets of cases in which nausea and vomiting were found: direct irritation of the stomach and intestines, or sympathetic irritation.[74] In the first division were included inflammation of the stomach, gastritis, undigested foods or medicinal irritants, ulcers, cancers, diseases of the duodenum,

[67] Cuvier, '*On Vomiting*', p. 429.
[68] Hall, 'On the Reflex Function', p. 653.
[69] Manuel, *Marshall Hall*, p. 245 and Clarke and Jacyna, *Nineteenth-Century Origins*, p. 122.
[70] Hall, 'On the Reflex Function', p. 653.
[71] Hall M., *An Essay on the Symptoms and History of Diseases; Considered Chiefly in their Relation to Diagnosis* (London: Longman, Hurst, Rees, Orme, and Brown, 1822), p. 2.
[72] Hall, *On the Neck*, p. 39.
[73] For example see Malcolm A.G., *An Introduction to Clinical Study, or, An Interpretation of Symptoms and Signs* (Belfast: Henry Greer, 1856), p. 81.
[74] Habershon S.O., *Pathological and Practical Observations on Diseases of the Abdomen*, 2nd edn (London: John Churchill, 1862), pp. 224-5; Tanner T.H., *A Manual of Clinical Medicine and Physical Diagnosis*, 2nd edn (London: Henry Renshaw, 1869), pp. 125-6; Guttman P., *A Handbook of Physical Diagnosis. Comprising the Throat, Thorax, and Abdomen*, Napier A. (trans.), from the 3rd German edn (London: The New Sydenham Society, 1877), pp. 396-7.

intussusceptions and hernias, to name merely a few.[75] The causes of sympathetic irritation included diseases of the liver, gall-bladder, kidney, uterus, ovaries, spine, brain, lungs and conditions of the blood and general nervous system (such as fevers and possibly cholera). However more specialised texts, such as that written by George Budd (1808-82), a physician who made numerous contributions to literature on the gastrointestinal tract, divided these categories further. For instance in his 1856 *On Organic Disease and Functional Disorders of the Stomach*, Budd outlined four classes of conditions which were accompanied by vomiting: organic diseases of the stomach, mechanical impediments to the movement of food, irritation in another organ resulting in nervous sympathy, and morbid states of the blood.[76]

By the 1870s reflex theory was systematically entrenched in understandings of pathological vomiting. The standard divisions used in diagnosis were: local (gastric-based, including gas and food distension, irritation from bile, poisons, inflammation, ulceration and cancer), central (from the vomiting centre, brain, blood-poisoning such as that caused by fevers, hysteria and motion sickness), or peripheral (irritation of the peripheral branches of the pneumogastric nerves, such as intestinal strangulation, kidney inflammation, pregnancy and uterine diseases).[77] Habershon depicted the various causes of spasmodic vomiting, according to various local and sympathetic causes, in his 1867 Lumleian Lectures (see Figure 3 below).[78] Habershon's presentation suitably illustrates the shift, typical of medicine more widely over the mid nineteenth-century period, from humoral accounts of vomiting, to anato-physiological ones, and how this localised view of its origins was potentially useful in diagnosis.

[75] Habershon, *Pathological and Practical Observations*, p. 225.
[76] Budd G., *On Organic Disease and Functional Disorders of the Stomach* (Philadelphia: Blanchard and Lea, 1856), p. 211.
[77] Vierordt O., *A Clinical Text-Book of Medical Diagnosis for Physicians and Students*, Stuart F.H. (trans.) (Edinburgh and London: Young J. Pentland, 1891), p. 358. For a physiological explanation of these categories see Carpenter, *Principles of Human Physiology*, p. 408.
[78] 'Obituary: Samuel Osborne Habershon', *BMJ* (14th September 1889), pp. 627-8.

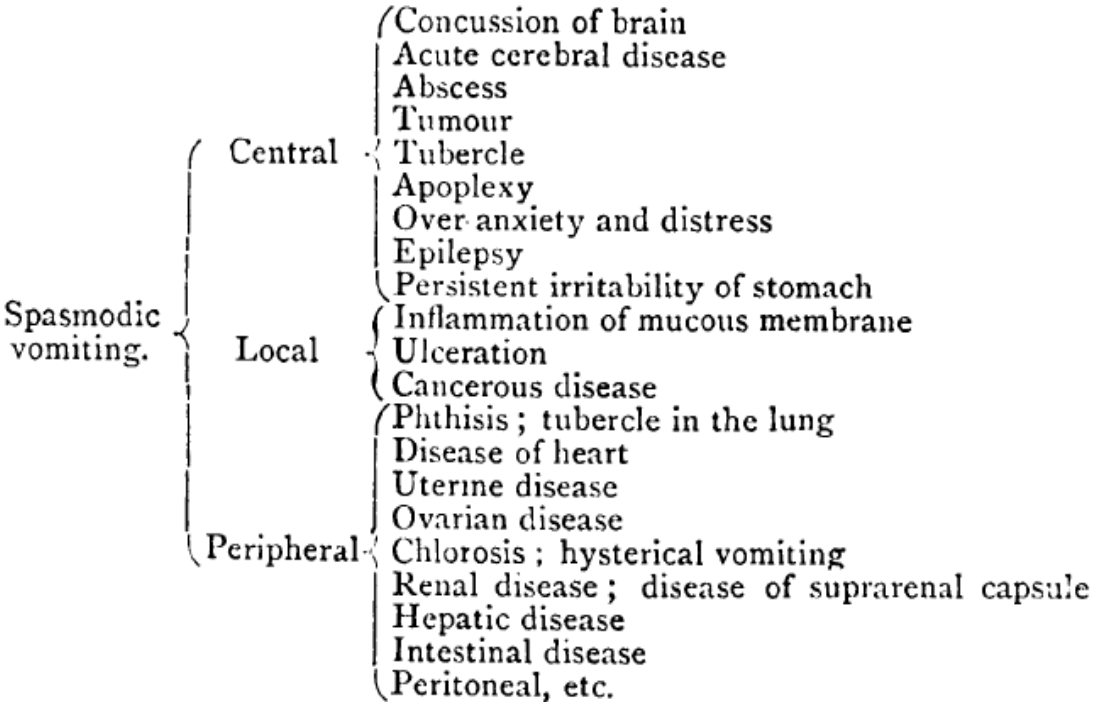

Figure 3. Habershon's tabulation of the central, local and peripheral causes of spasmodic vomiting

Source: Habershon S.O., 'Lumleian Lectures on the Pathology of the Pneumogastric Nerve', *BMJ* (27th May 1876), p. 651.

Whilst reflex theory explained how nausea and vomiting could be caused in a multiplicity of ways, this was not necessarily of direct benefit to the practitioner. 'This symptom is,' the pathologist Andrew George Malcolm (1818-56) noted in 1856, 'by no means one easy of interpretation in actual practice in many cases, and simply in consequence of its many possible causes.'[79] Writing in 1875 Paul Henry Stokoe, a physician at Guy's Hospital, also declared his opinion that:

> There is no more practical or comprehensive question that could be asked of the young practitioner or the aspirant to a medical degree than this:- How would you recognise and treat the various cases of vomiting, which may come under your notice?- and in our professional routine this obtrusive query besets us at every turn.[80]

Indeed, the acceptance of the nervous physiology of vomiting, as Chambers wrote in 1867, meant that '[t]he mere fact of vomiting [...] affords in itself no clue to the local condition of the stomach.'[81] Rather, a physician had to learn how to differentiate between the various types of vomiting. Chambers went on to write that 'the time of occurrence, the circumstances which increase it, and the nature of the matters thrown up, may be most suggestive to the practitioner.' Malcolm taught for instance that:

> *Painful* vomiting generally indicates a local inflammatory cause; while *difficult* vomiting is due either to local disease, or a nervous state. Chronic vomiting is a sign of great importance, sometimes due to cerebral disease, but most frequently to local or abdominal disease [...] The vomiting of food immediately after ingestion, argues either gastritis or gastric irritation, when not purely nervous when chronic, disease of the cardiac orifice or œsophagus must be looked for; and when hours elapse ere vomiting of food comes on, the pylorus may be considered diseased.[82]

The presence or absence of pain in the stomach was thought to be particularly indicative; if vomiting was caused remotely it was not usually accompanied by gastric

[79] Malcolm, *An Introduction to Clinical Study*, p. 82.
[80] Stokoe P.H., 'Practical Remarks on the Causes and Treatment of Some Common Forms of Vomiting', *Guy's Hospital Reports* (1875) **20**, p. 481.
[81] Chambers, *The Indigestions*, p. 173.
[82] Malcolm, *An Introduction to Clinical Study*, p. 82; Budd, *On Organic Disease*, p. 211.

discomfort.[83] Pain in the stomach could then also be distinctive. If it occurred immediately after a meal it was indicative of specific lesions such as a gastric ulcer, whereas pain associated with vomiting that occurred after a delay, during the digestive period, was more likely to be dyspepsia.[84] Alternatively, when accompanied by a headache, this was more likely to be vomiting of central nervous origin. According to Budd, the presence of nausea was indicative that the vomiting was as a result of sympathetic nervous irritation, and this vomiting was often 'more distressing and more uncontrollable than any other.'[85]

The most common differentiation set out by authors of diagnostic texts was to distinguish stomach-based vomiting from that of cerebral origin. Vomiting was seen frequently in cerebral disease and was understood to be the result of abnormal irritation of the pneumogastric nerve at its origin in the brain stem.[86] In the second edition of his clinical medicine manual published in 1869, the physician Thomas Hawkes Tanner (1824-71) placed particular weight on the presence or absence of nausea to distinguish between these conditions. If there was nausea, relief after vomiting and pains in the abdomen, for instance, Tanner wrote that the disorder lay in the region of the stomach.[87] If nausea did not precede vomiting, if vomiting continued after the stomach was emptied and there was a constant headache, then the vomiting was likely to be of cerebral origin. The lack of nausea was frequently cited as being indicative that the disorder was not connected to the cerebrum, which supported the notion that nausea was perceived as a sensation of the abdomen, rather than the head.[88] In 1877 Thomas McCall Anderson (1836-1908), then Professor of Clinical Medicine, used two ward cases from the Royal and Western Infirmaries in Glasgow to illustrate these

[83] Barclay A.W., *A Manual of Medical Diagnosis: Being an Analysis of the Signs and Symptoms of Disease* (London: John Churchill, 1857), p. 210; Gibson G.A. and Russell W., *Physical Diagnosis: A Guide to Methods of Clinical Investigation*, 2nd edn (Edinburgh and London: Young J. Pentland, 1893), pp. 215-16.
[84] Finlayson, *Clinical Manual*, p. 323; Gibson and Russell, *Physical Diagnosis*, p. 216.
[85] Budd, *On Organic Disease*, p. 216.
[86] Howship J., *Practical Remarks on Indigestion* (London: Longman, Hurst, Rees, Orme, Brown, and Green, 1825), p. 125; Budd, *On Organic Disease*, p. 144; Guttman, *Handbook of Physical Diagnosis*, p. 397.
[87] Tanner, *A Manual of Clinical Medicine*, p. 279. For more on vomiting in connection with the brain see Ferrier D., 'Vomiting in Connection with Cerebral Disease', *Brain* (1879) **2**, pp. 223-33. Similar explanation in Graham Brown J., *Medical Diagnosis: A Manual of Clinical Methods* (Edinburgh: Bell & Bradfute, 1882), pp. 31-2, without reference to nausea.
[88] Finlayson, *Clinical Manual*, pp. 323-4; Gibson and Russell, *Physical Diagnosis*, p. 216.

differences.[89] The patients, whilst both suffering from vomiting, exhibited two distinct sets of symptoms:

> [The first patient] began to suffer from pain in the stomach after taking food – a pain which in a couple of months became much more severe, and then was accompanied by vomiting. In [the second patient], on the other hand, the symptoms were referable to the nervous system – namely, impairment of sight, paralysis of the side of the face, and pain in the head – symptoms which were succeeded by vomiting.[90]

In addition, the first patient retched whilst the second vomited easily, food made no difference to the second patient's health, whilst the first patient became increasingly emaciated and exhibited a 'lemon tint of the skin'.[91]

Emetics and Anti-Emetics

Whilst being central to physiological and pathological interpretations of nausea and vomiting, reflex theory also shaped understandings of emetics and anti-emetics. As with the diagnosis of nausea and vomiting, the focus was on distinguishing between the stomach and the brain as the seat of action. The use of emetics has a long history in health and medicine; along with blood-letting it was the best known and most frequently employed humoral therapy. Humoral theories of disease began to fall out of favour in the early nineteenth century, though its remedies remained; the Parisian anatomico-clinical approach was, John Harley Warner claims, characterised by therapeutic nihilism.[92] As diseases were seen as the body's way of healing itself, many remedies aimed to accelerate the 'expression' of signs and symptoms. Nonetheless, the justification for the administration of emetics changed, albeit slowly, within the framework of a nervous pathology. What rationalisations were employed for the continued use of vomiting as both a preventive and treatment method? Simultaneously, how did physiological interest in drugs change the way in which nausea and vomiting were perceived?

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[89] 'Obituary. Sir Thomas McCall Anderson', *BMJ* (8th February 1908), pp. 355-7.
[90] McCall Anderson T., *Lectures on Clinical Medicine delivered in the Royal and Western Infirmaries of Glasgow* (London: Macmillan, 1877), pp. 39-40.
[91] McCall Anderson, *Lectures on Clinical Medicine*, pp. 40-3.
[92] Warner J.H., *The Therapeutic Perspective: Medical Practice, Knowledge and Identity in America, 1820-1885* (Cambridge and London: Harvard University Press, 1986).

In the 1809 *London Medical Dictionary*, emetics were described as 'so extensive, and their effects so important' that the entry on their use was justifiably lengthy.[93] The author – physician and medical writer Bartholomew Parr (1750-1810), whose reputation rested mainly on this dictionary – explained the various physical benefits of emetics.[94] These included the evacuation of the stomach contents, their assistance in the discharge of bile, and preventing obstruction of blood to the liver.[95] Broadly speaking, therefore, the treatment 'worked' in two ways: either the mechanical expulsion of an irritating substance or object, or the systemic influence that vomiting effected. The latter benefit was described by John Hunter, a physician at St George's Hospital who delivered a lecture series on physiology and surgery in the early 1840s, as occurring in the following manner: '[s]ickness lessens the power of life, therefore vomits are useful in abating inflammation; but if carried so far as full vomiting, they counteract their first effect, for full vomiting rouses the powers of life.'[96] Whilst the most obvious benefits of vomiting were seen in cases where there was direct irritation of the stomach or alimentary system, or where the violent muscular efforts acted to clear the lungs and air-passages, it was also seen as a more general energising process.[97] In this sense the physical exertion of vomiting was likened to a 'clap of the hands', akin to shocking a patient out of an epileptic attack or fit of hysteria.[98]

Yet the notion that vomiting with emetics resulted in energising the bodily system was juxtaposed frequently against the fact that it could also debilitate the body. This effect was most evident in cases of cholera. During and following the 1831 epidemic, for example, discussions arose amongst doctors about the best use of emetics to combat this disease. One correspondent to the *Cholera Gazette* in 1832 wrote that a 'fuller' vomiting was more beneficial to the body than the spasmodic vomiting that was most

[93] Parr B., *The London Medical Dictionary* (London: J. Johnson, 1809), p. 600.
[94] Cameron A., 'Parr, Bartholomew (1750–1810)', *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004) [http://www.oxforddnb.com/view/article/21393, accessed 20th July 2011].
[95] Parr, *Medical Dictionary*, p. 601.
[96] Hunter J., 'Course of Lectures on Physiology and Surgery: Delivered at St. George's Hospital', *Provincial Medical and Surgical Journal* (10th July 1841), p. 282.
[97] Hunter, 'Course of Lectures', p. 282 and Warning, 'Theory of Vomiting', p. 117.
[98] Quote from 'Therapeutical Memoranda', *BMJ* (15th January 1870), p. 54. See also Brunton, 'On the Physiology of Vomiting', p. 428. Ferrier specifically attributed this (later in the century) to a rise in blood-pressure, which had a positive affect on the body. Ferrier, 'Vomiting in Connection with Cerebral Disease', p. 223 and pp. 228-33. See also Brunton T.L., 'Reflex Actions as a Cause of Disease and Means of Cure', *Brain* (1878) **1**, p. 146.

associated with cholera; this was due to the fact that it had a greater stimulating action.[99] In practise this meant choosing between salt water and mustard emetics. Nonetheless, there were others who explicitly questioned the mode by which emetics were beneficial in an illness so characterised by purging. In 1834 Robert Venables, a physician from Wick, wrote to the Central Board of Health requesting that practitioners question the efficacy of treating cholera with salt water, arguing that

> vomiting induced by any other means has not the same effect. In my observations, the vomiting was easy, no way violent, nor attended with any straining; and I also observed that the more violent the vomiting, either natural or artificial, the more severe the consecutive fever, the greater the congestion or inflammatory symptoms in the brain, and ultimately the more fatal the cases.[100]

Whilst Venables recommended the use of salt water, it seems that it was not for inducing vomiting as such, rather that it encouraged cholera to progress to its final stage (the sweating stage, as opposed to the earlier cold stage). This was understood by practitioners as a more typical therapeutic practice which involved encouraging the body's disease, which was its own manner of healing.

Justifications for the use of emetics, even following the popularisation of Hall's nervous theory, did not always follow directly nervous explanations. For example, Charles J. Hare (1818-98), physician to the University College Hospital, claimed that it was 'consonant with experience and reason, that the absorption of remedies from a well cleaned-out stomach should be more rapid'; the milk remedy preferred by Hare would give its nourishing benefits more effectively.[101] Neither was their application standardised. The quantity and quality of purging produced by the administration of emetics varied greatly; hence doctors were expert in dosage and monitoring the idiosyncrasies of patients.[102] In the early nineteenth century emetics were broadly divided into two functional types: sedatives (opium, oil, warm water) and stimulants (mustard, mercurials, ipecacuanha). They were administered either directly to the

[99] See for example Melin W.R., 'Report on the Treatment of Cholera', *Cholera Gazette* (28th January 1832), p. 73 and 'Extracts from a Letter from Mr. Bullen to the Central Board, Prefatory to the Details of Two Cases', *Cholera Gazette* (14th January 1832), p. 40.
[100] Venables R., 'Administration of Emetics in Malignant Cholera', *Lancet* (30th August 1834), p. 807.
[101] Hare C.J., 'An Address on Good Remedies – Out of Fashion', *BMJ* (28th July 1883), p. 152. Hare was President of the Metropolitan Counties Branch of the British Medical Association.
[102] Greenwood W., 'Tartar Emetic in Delirium Tremens', *Lancet* (18th June 1836), p. 388; 'On the Action of Emetics', *MTG* (March-October 1844) **9**, p. 144; Burney Yeo J., 'Clinical Lecture on the Relation of Clinical Observation to Therapeutic Research', *BMJ* (23rd May 1874), p. 671.

stomach, or into the blood. At the time of Magendie's 1813 lecture, doctors differed on how emetics administered via the stomach worked on the nervous system to produce vomiting. The report's authors considered whether they acted directly on the nerves of the stomach, or whether they were absorbed into the blood and transported via the circulation.[103] Magendie's experiments, whereby emetics were injected directly into the blood, suggested to him the second mode of action.

Later in the nineteenth century, with a different understanding of the role of the nervous system and an increased interest in pharmacology, practitioners took more interest in how drugs acted on the excito-motor system.[104] The most extensive studies undertaken in Britain were those performed by Brunton and published in his 1874 article 'On the Physiology of Vomiting and the Action of Anti-Emetics and Emetics'. The most common way to respond to vomiting, Brunton wrote, was to combine the methods of removing the source of irritation and lessening the irritability of the nervous centre in the medulla oblongata, or sometimes a combination of the two.[105]

Brunton's work clearly demonstrates that interest in emetics had not diminished by the late nineteenth century, and their use was still prevalent. 'Sometimes', Brunton wrote, 'we want to induce vomiting.'[106] There were two classes of emetics according to his investigations, the division dependent on the location upon which they acted. The first class acted when administered directly into the stomach (such as mustard, sulphates of zinc and copper, or other irritants) and were known as mechanical emetics. The second class acted when introduced into the stomach or injected into the veins (such as tartar emetic, ipecacuanha and apopmorphoa). It had generally been accepted that these emetics acted by irritating the medulla oblongata, although Brunton suggested that it was the combined effect on the vomiting centre and irritation of the stomach that worked. This view enjoyed Foster's authoritative support.[107]

Authors of physiology and pharmacology reviews in the main medical journals reflected regularly in the late nineteenth century on the lack of practical knowledge on this subject, before and after Brunton's publication. In 1869 physiologists Arthur Gamgee

[103] Cuvier, '*On Vomiting*', p 437.
[104] An early example of this is Hughes R., 'On the Influence of Belladonna on the Pneumogastric Nerve', *BMJ* (26th May 1860), p. 393.
[105] Brunton, 'On the Physiology of Vomiting', p. 419.
[106] Brunton, 'On the Physiology of Vomiting', p. 421.
[107] Foster, *A Text Book of Physiology*, p. 204.

(1841-1909) and William Rutherford (1839-99), with pharmacologist Thomas Fraser (1841-1920), published in the *Journal of Anatomy and Physiology* on how ipecacuanha and other emetics acted physiologically, 'for our knowledge […] is in an extremely unsatisfactory condition'.[108] Following this call, physiologists' attention was diverted to exploring how these drugs acted. A small report was published in the same journal in 1872 on the experiments of the German physiologist Ludimar Hermann (1838-1914), who authored works on experimental pharmacology and toxicology, which found that tartar emetic acted directly on the stomach, rather than the vomiting centre.[109]

The following year Fraser drew attention, again in a 'Report on Pharmacology', to the results of experiments on the physiology of vomiting that had been published in the *Bulletin General de Therapeutique* earlier that year. In the paper written by French practitioner Antonio-Evaristo D'Ornellas (d.1904), the action of emetics had been explored in experiments that demonstrated they acted faster to cause vomiting when administered directly to the stomach, rather than when given by subcutaneous injection, which took three times as long to produce results.[110] This led D'Ornellas to argue that these emetics (metia and tartar emetic) worked by acting specifically on the peripheral terminations of the pneumogastric branches in the stomach, though others may have had a different mechanism. Similar reports the previous year had noted that tartar emetic acted faster when introduced into the stomach rather than the blood stream. This result was interpreted by the investigator to mean that vomiting was caused by irritation of the stomach by the drug, rather than any action on a vomiting centre.[111] However, opinion was divided on this fact. Although agreeing that some emetics, such as mustard and water, acted by irritating the gastric mucous membrane, in his 1877 *Text Book of Physiology*, Foster taught that other emetics, such as tartar, acted directly on the vomiting centre, as they initiated vomiting even when a bladder had been substituted for a stomach.[112] Furthermore, there was another class of emetics, Foster argued, which

[108] Gamgee A., Fraser T.R. and Rutherford W., 'Report on the Progress of Physiology: From 1st April to 1st August 1869', *Journal of Anatomy and Physiology* (4th November 1869), p. 169.
[109] Brunton T.L. and Ferrier D., 'Report on Physiology', *Journal of Anatomy and Physiology* (1872) **7:1**, p. 186.
[110] Fraser T.R., 'Report on Pharmacology', *Journal of Anatomy and Physiology* (8th November 1873), p. 230, referring to D'Ornellas A.E., *Bulletin General de Therapeutique* (15th March 1873), p. 193. Similar findings in Stirling W., 'Report on Physiology', *Journal of Anatomy and Physiology* (10th April 1876), p. 655.
[111] Brunton and Ferrier, 'Report on Physiology', p. 186.
[112] Foster, *A Text Book of Physiology*, p. 204.

'cause vomiting by developing a nauseous taste, the reflex action involves parts higher than the centre itself.'[113]

Understandings of the mechanism of vomiting and the action of emetics and anti-emetics were complex and fluid, and the topic encouraged much speculation from alternative practitioners through to editors of authoritative medical textbooks. The homeopath Richard Hughes (1836-1902), for instance, theorised in his early career that belladonna acted as a sedative upon the pneumogastric nerve, because this was the nerve believed to be involved in the motor actions of vomiting.[114] There were also evidently practitioners who, towards the end of the nineteenth century, saw emetics as detrimental to health. In 1882 Hare lectured that he was well aware 'that a great fear is entertained by some as to the depressing effects of emetics; but the fear is theoretical, and not practical, and those who have had most experience in the administration of them best know how groundless the fear is.'[115] These fears appear to have been marginal and represented fractured views; emetics were still being regularly employed. Indeed, regardless of the numerous changing and disputed understandings, the physician Thomas Clifford Allbutt (1836–1925), writing on 'Neuroses of the Stomach' in his encyclopaedic edited collection *A System of Medicine* (1897) wrote of the patient: 'If he vomit he is a lucky man; if he take an emetic, he is a wise one.'[116]

2.5 Vomiting and Psycho-Physiology

Sensori-Motor Reflex and Pathology

In *The Healthy Body and Victorian Culture*, Bruce Haley investigates the significance of the idea of 'total health or wholeness' – *mens sana in corpore sano* – to Victorians, whereby the body, mind, and spirit were conceptualised together.[117] Haley suggests that two factors which contributed to the 'philosophical framework for exploring the mind-body connection' were, firstly, the development of physiology as a science with particular focus on the digestive, respiratory and neural systems, which led to 'a concept

[113] Foster, *A Text Book of Physiology*, p. 204.
[114] Hughes, 'On the Influence of Belladonna', p. 393.
[115] Hare, 'Good Remedies', p. 152.
[116] Allbutt T.C., 'Neuroses of the Stomach and of other Parts of the Abdomen', in Allbutt T.C. (ed.), *System of Medicine by Many Writers*, vol. 3 (London: Macmillan and Co., 1897), p. 468.
[117] Haley B., *The Healthy Body and Victorian Culture* (Cambridge, Massachusetts and London: Harvard University Press, 1978), p. 4.

of the whole physiological man,' and secondly, the claim of physiological psychology that the mind and body were interdependent.[118]

Understandings of how the mind was involved in motor actions were numerous. There were those, including physician and social reformer William Pulteney Alison (1790-1859), who maintained that sympathetic actions were the result of mental sensations. Opposing this were those who favoured a mechanistic explanation, following Magendie.[119] Hall's reflex theory fell clearly into the mechanistic camp, whereby he made a strict division between physiological and moral actions, or reflex and voluntary ones. He stated in 1838 that the sight of a disagreeable object could cause vomiting through the medulla oblongata, and so emotions might act 'by a sort of countrecoup'.[120] Hall had, however, excluded the cerebrum (or sentient-volition system, considered in the early nineteenth century to be the seat of the will and consciousness) as a mediator of reflex acts.[121]

In discussions of psycho-physiological theory in the 1840s and 1850s, some doctors and scientists attempted to extend Hall's reflex theory to the mind.[122] It was Thomas Laycock who was credited with proposing that reflex actions could be applied to higher functions, followed later by William Carpenter.[123] Laycock (1812-76) was a York physician (elected Professor of the Practice of Medicine and Clinical Medicine in the University of Edinburgh in 1855) who was predominantly consulted on nervous diseases.[124] Laycock believed in a unity of nature, an 'ordering intelligence omnipresent

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[118] Haley, *The Healthy Body*, pp. 23-45, chapter on 'Victorian Psychophysiology'. The third factor which Haley considered was the belief that education developed the whole man, including his physical being. Roger Smith claims that the late nineteenth century did not see a *popularization* of knowledge about mind and brain, but the '*shaping* of an area of discourse, known as psychology' within periodicals. See Smith R., 'The Physiology of the Will: Mind, Body, and Psychology in the Periodical Literature, 1855-1875', in Cantor G. and Shuttleworth S. (eds), *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals* (Cambridge, Massachusetts; London: MIT Press, 2004), p. 82.

[119] See Leys, 'Background to the Reflex Controversy'.

[120] Hall, 'Lectures on the Theory and Practice of Medicine', p. 98. Countrecoup meaning an injury to a site of the brain other than that of the primary injury.

[121] Leff A., 'Thomas Laycock and the Romantic Genesis of the Cerebral Reflex', *Advances in Clinical Neuroscience and Rehabilitation* (2003) **3:1**, p. 26; Jacyna L.S., 'The Physiology of Mind, the Unity of Nature, and the Moral Order in Victorian Thought', *British Journal for the History of Science* (1981) **14:2**, p. 111.

[122] Jacyna, 'The Physiology of Mind', p. 111.

[123] Danzinger K., 'Mid-Nineteenth-Century British Psycho-Physiology: A Neglected Chapter in the History of Psychology', in Woodward W.R. and Ash M.G. (eds), *The Problematic Science: Psychology in Nineteenth-Century Thought* (New York: Preager, 1982), p. 125. Carpenter agreed with Hall before later changing his mind. See Leff, 'Thomas Laycock and the Romantic Genesis', p. 27.

[124] 'Obituary. Thomas Laycock', *BMJ* (30th September 1876), pp. 448-9.

in nature,' meaning that there would be no division at the entrance to the cerebrum.[125] Rather than the 'prevailing dualism', Laycock argued that reflex was a more general governing concept, stating that '[m]ind was objective, not subjective, and it manifested itself in the order of nature'.[126] Mind, in exciting sensation, was able to act on the nerves.[127] Ideas or conceptions, Carpenter later added, were cerebral states which could 'recall' the sensory condition which had been originally induced.[128] Carpenter's arguments carried weight with contemporaries. He and Laycock built on Hall's theory of reflex function, introducing psychological concepts into it.[129]

In 1855 Robert Dunn (1799-1877), a physician who urged his colleagues to understand the physical basis of psychological disease, wrote that:

> The nervous force is a polar force; and the sensory ganglia, placed midway between the poles, may be played upon from either end; from below or from above; upwards from the outer world, by the appropriate physical stimulus upon the nervous vesicular expansion of each of the external organs of the sense; downwards from the cerebrum, from the inner or psychical world, by the flow of the thoughts and the workings of ideo-dynamical, emotional, and moral agencies in the cerebral organs.[130]

Dunn's ideas were representative of many writers of the mid nineteenth century regarding how human psychology and physiology interacted, and how this varied between normal and diseased states. However, in what ways were nausea and vomiting, more specifically, linked to matters of the mind?

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[125] Leff A., 'Thomas Laycock and the Cerebral Reflex: A Function Arising From and Pointing to the Unity of Nature', *History of Psychiatry* (1991) **2**, p. 393; Danzinger, 'British Psycho-Physiology', pp. 125-6.
[126] Danzinger, 'British Psycho-Physiology', pp. 126-7.
[127] Laycock T., 'Analytical Essay on Irregular and Aggravated forms of Hysteria', *Edinburgh Medical and Surgical Journal* (1839) **52**, p. 48.
[128] Carpenter, *Principles of Human Physiology*, p. 727.
[129] Danzinger, 'British Psycho-Physiology', pp. 121-4 and pp. 133-4.
[130] Dunn R., 'Commentary on Some of the More Important Bearings of the Case of Suspension of the Mental Faculties, etc: with Remarks upon the Philosophy of the Human Mind, and the Physiological Psychology of Man', *Association Medical Journal* (17th August 1855), p. 760. Similar arguments can be found in Piggott G.W., *On Poverty of the Blood and its Sympathetic Disorders of the Liver, Stomach, and Nervous System* (Harrogate: Hollins and Moxton, 1858), p. 10; Laycock T., 'Contributions to a New Chapter in the Physiology and Pathology of the Nervous System', *BMJ* (8th February 1868), p. 115; Pavy, *A Treatise on the Function of Digestion*, p. 95.

As the medulla was increasingly accepted by physiologists and practitioners in the second half of the nineteenth century as the centre from which vomiting was controlled, the brain, its functions and its role in pathology, was integrated into discussions of symptomatology. Cerebral disease had always been recognised as a cause of vomiting in diagnostics, but the connection with ideas and emotions, for instance, was more ambiguous. In his 1828 lectures on the theory and practice of medicine, Hall outlined that the medulla was the nervous centre through which the many causes of vomiting, including visual disturbance, motion, blows to the head, and certain emotions, acted.[131] He also distinguished between the 'true' excito-motor system of the spinal cord, and the reflexes of sensation and emotion, though he admitted that vomiting might be excited through both. 'I have known it,' Hall wrote of hysteria (which he considered a disease of the emotions), 'induce dyspnoea, vomiting, jaundice, relaxation of the sphincters, palpitation, syncope; to blanch or flush the cheeks; to arrest the secretion of the saliva, of the bile, and singularly to augment that of the perspiration and urine.'[132]

In his 1846 text *Elements of Physiology,* Carpenter noted that vomiting was one of several actions about which it was difficult to say with certainty whether it was a simple reflex action, or whether sensation was involved.[133] In vomiting caused by impressions, received through the sensorial centres (sensational or emotional), Carpenter included that induced by tickling the fauces, or that which occurred as a result of disgusting sights, odours or tastes.[134] A recalled memory of these sensations would excite again the original emotional state, which could be effective in producing vomiting itself. Vomiting caused in these ways, alongside for instance 'the sickness produced by a blow on the eye-ball or on the shin,' were sensori-motor reflex acts.[135] According to Laycock the mechanism by which this occurred involved '[a]n event in the outside world [which] acts upon the nervous system and imposes physical changes therein which transfer

[131] Hall, 'Lectures on the Theory and Practice of Medicine', p. 98.
[132] Hall M., 'Third Memoir on Some Principles of Pathology of the Nervous System', *Medical and Chirurgical Transactions* (1840) **23**, p. 173.
[133] Carpenter W.B., *Elements of Physiology, including Physiological Anatomy, for the use of the Medical Student* (Philadelphia: Lea and Blanchard, 1846), p. 514.
[134] Carpenter, *Principles of Human Physiology*, pp. 863-4.
[135] Carpenter, *Principles of Human Physiology*, p. 727; Marshall J., *Outlines of Physiology*, vol. 2 (London: Longmans, Green, and Co., 1867), p. 52.

themselves from ideas to movements, all without the will.'[136] In his view all reflexes were changes in neuronal matter.[137]

Twenty-five years later David Ferrier (1843-1928), demonstrator of practical physiology at King's College and later leading neurologist, wrote that unpleasant odours or tastes were able to induce vomiting because they were 'practically the same thing as gastric irritants – the senses of smell and taste being merely the advanced guard of the stomach'.[138] Impressions were thought by Ferrier to be centrally reproduced, resulting in the nervous reflex response. This explained why '[t]he sight of vomited matters, and still more the sight of a person vomiting, especially if there is any tendency to sickness already existing, are sufficient to bring matters to a crisis'.[139] Ferrier believed that vomiting in these cases was a result of actual irritation, either central, peripheral, due to the stomach's sensory, or physical nerves.[140]

Thus, while most physiologists agreed that nausea and vomiting could be brought on in these ways, the explanation for it varied.[141] As Roger Smith demonstrates, Victorian language reflected the difficulty faced in linking the body and mind, partly in response to anxieties about individual human agency: '[t]here were references to mental science, mental physiology, the physiology of the will, unconscious cerebration, the physiology and pathology of the mind, moral insanity, and lesion of the will.'[142] Anatomical-physiological explanations were not straightforward, and physiologists struggled to account for the relationship between psychological and nervous processes.[143] However, many clinicians towards the end of the nineteenth century maintained that 'emotional ills, altered mood state, and even patterns of behavioural deviance [were] legitimate diseases,' and could in and of themselves cause physical symptoms and local lesions.[144]

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[136] Leff, 'Thomas Laycock and the Cerebral Reflex', p. 395. Laycock was criticised for not having distinguished between 'true' excito-motor reflexes (of the spinal cord) and reflexes of sensation and emotion, according to Hall's theory.
[137] Leff, 'Thomas Laycock and the Cerebral Reflex', p. 404.
[138] Ferrier, 'Vomiting in Connection with Cerebral Disease', p. 223-4.
[139] Ferrier, 'Vomiting in Connection with Cerebral Disease', p. 224.
[140] Ferrier, 'Vomiting in Connection with Cerebral Disease', pp. 224-5.
[141] For example see Chambers, *The Indigestions*, pp. 172-3 and Brunton T.L., *On Disorders of Digestion: Their Consequence and Treatment* (London: Macmillan & Co., 1886), p. 54.
[142] Smith, 'The Physiology of the Will', p. 81.
[143] Smith, 'The Physiology of the Will', pp. 88-9. See also on clinical neurophysiology, 'An Introduction to the Life and Work of John Hughlings Jackson', *Medical History Supplement* (2007) **26**, pp. 3-34.
[144] Rosenberg C.E., 'Body and Mind in Nineteenth-Century Medicine: Some Clinical Origins of the Neurosis Construct', *BHM* (1989) **63:2**, p. 194.

Hysteria and Disordered Digestion

Over the nineteenth century doctors and scientists had connected nausea and vomiting with various locations in both the body and mind. Nonetheless, there remained cases of chronic, symptomatic, or obscure vomiting, which could not be attributed to a specific somatic abnormality, or were considered a result of functional, nervous disorders that were difficult to pin down. In this section I address what Tom Robinson, a London-based physician, referred to in 1893 as the 'instances of vomiting which seem to be a trick or habit of the stomach'.[145] Drawing upon the words of Sir William Gull (1816-90), Robinson declared the stomach to be '[a] mad organ.'[146] One particular diagnosis which reflected the potential 'trickery' or 'madness' of the stomach was hysterical vomiting. Occurring amid a concern with nervous gastric disorders, many of these cases broadened the practitioner's outlook further beyond the gastric system, and converged along the lines of psychiatry, neurology and physiology.

Medical practitioners caring for the Victorian insane recognised that disordered digestion and food-refusal (regularly caused by dyspepsia, delusions to food, 'stupidity,' and lesions of the brain or internal organs) were common amongst their patients.[147] Women in particular were thought to be prone to problems of appetite due to the sensitivity of their digestive and reproductive systems.[148] Historical literature on disordered digestion has chiefly documented the various forms of food-refusal, in regards to appetite, and doctors' attempts to combat it within an institutional setting.[149] In this section, however, I am considering the significance of food-rejection, in the form of vomiting, as a sign and symptom.

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[145] Robinson T., 'Sudden Death in a Case of Hysterical Vomiting', *Lancet* (10th June 1893), p. 1381.
[146] Robinson, 'Sudden Death', p. 1381. William Gull was a prominent physician and governor of Guy's Hospital who first established the name *anorexia nervosa*.
[147] Williams S.W.D., 'Remarks on the Refusal of Food in the Insane', *Journal of Mental Science* (October 1864) **10:41**, pp. 366-80; Shorter E., 'The First Great Increase in Anorexia Nervosa', *JSH* (1987) **2:1**, p. 73.
[148] Brumberg J., *Fasting Girls: The History of Anorexia Nervosa* (New York: Vintage Books, 2000), p. 171.
[149] This has included vomiting only as an unpleasant side-effect of force-feeding. For example see Miller I., 'Necessary Torture?: Vivisection, Suffragette Force-Feeding, and Responses to Scientific Medicine in Britain c. 1870-1920,' *JHMAS* (2009) **34:3**, pp. 358-65. Brumberg has considered food-refusal in the form of anorexia (simply lack of appetite), as a symptom presented by the substantial proportion of those admitted to lunatic asylums, and the first description in 1859 of sitomania – a 'phase of insanity' characterised by an 'intense dread of food'. Brumberg, *Fasting Girls*, pp. 101-5.

Hysteria was predominantly considered to be a functional disease of the nervous system 'characterized by its peculiar excitability,' producing a multiplicity of associated physical ailments, such as pain, paralysis and fits.[150] Laycock had referred to this as part of the 'doctrine of crisis' concept, which was based on a continuance of Whytt's notion of sympathy and nervous irritability.[151] Beyond the somatic, however, hysteria was additionally a manifestation of the mind. In *The Principles of Mental Physiology* (1876), Carpenter wrote that hysteria was connected to an 'excitability of the *Emotions*; and, from their known influences on the "vaso-motor" Nerves […], it seems likely that many of its manifestations are produced through the instrumentality of that system.'[152]

In healthy individuals, Michael J. Clark writes, 'two conditions, mental and physical, coexisted and maintained a certain relational equilibrium between themselves, but did not normally interact with or otherwise influence each other *directly*.'[153] In cases of mental disorder, this coexistence faltered. Over the nineteenth century, texts on diagnosis increasingly taught that vomiting could be a symptom of hysteria. Such cases were said to be a reflex action of the brain, frequently allied with cerebral and spinal disease, sea-sickness, Asiatic cholera, kidney inflammation and pregnancy.[154] In 1869 Tanner stated that when vomiting occurred in hysteria 'no alarm need be excited, since [it was] merely symptomatic of irritation transmitted by the ganglionic nervous system to the stomach': a simple reflex action.[155] Diagnosis of hysterical vomiting was based on recognition of the patient's hysterical characteristics (the archetypal hysteric patient

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[150] Quote from Carpenter W.B., *Principles of Mental Physiology: With Their Applications to the Training and Discipline of the Mind and the Study of its Morbid Conditions*, 4th edn (London: Henry S. King, 1876), p. 79. For more on hysteria see Showalter E., *The Female Malady: Women, Madness, and English Culture, 1830-1980* (London: Virago Press, 1985) and Micale M.S., *Approaching Hysteria: Disease and its Interpretations* (Princeton, N.J.: Princeton University Press, 1995).

[151] This meant that women were prone to nervous disorders, particularly hysteria, enhanced by the sensitivity and delicacy of their nerves. Laycock T., *A Treatise on the Nervous Diseases of Women; Comprising an Inquiry into the Nature, Causes, and Treatment of Spinal and Hysterical Disorders* (London: Longman, Ore, Brown, Green, and Longmans, 1840), p. 150; Poovey M., '"Scenes of an Indelicate Character": The Medical "Treatment" of Victorian Women', *Representations* (1986) **14**, p. 146.

[152] Carpenter, *Principles of Mental Physiology*, p. 79.

[153] Clark M.J., 'The Rejection of Psychological Approaches to Mental Disorders in Late Nineteenth-Century British Psychiatry', in Scull A. (ed.), *Madhouses, Mad-Doctors and Madmen: The Social History of Psychiatry in the Victorian Era* (London: Athlone, 1981), p. 275.

[154] The similarities and links between the possible psychopathological causes and treatments of pregnancy and hysterical vomiting are seen on a number of occasions. See for example Martin J.M.H., *Hyperemesis Gravidarum, with Reference to its Etiology and Treatment* (Manchester: Examiner Printing Works, 1892), p. 9 and Evans D.J., 'On the Ætiology of the Nausea and Vomiting of Pregnancy', *American Gynæcological and Obstetrical Society* (January 1900), p. 2.

[155] Tanner, *A Manual of Clinical Medicine*, p. 12.

presenting with excitability, restlessness, inability to look others in the eye, for instance) and a dismissal of other somatic potential causes of the sickness.

Accounts of hysteria as an explanation for vomiting in institutional settings appear in medical journals during the 1860s.[156] In 1868 the report of a debate on how these cases came to be diagnosed as such was published in the *Lancet*. The discussion was sparked by the printing of a clinical lecture on 11th July which had been given at Charing-Cross Hospital on the topic of 'Hysterical Vomiting.'[157] The author was a senior physician at the hospital, lecturer at the medical school and fellow of the Royal College of Physicians by the name of Henry Hyde Salter (1823-71). Salter's aim was to bring 'attention to a case of vomiting of a curious and interesting kind – interesting from the peculiarity of its phenomena, and interesting in relation to diagnosis.'[158]

Salter began by writing that vomiting was a tricky and deceptive symptom, to be treated with caution and 'studied in the light of its surroundings.' According to him, the most common forms of vomiting found in women were - a) dyspeptic, b) resultant of ulcer of the stomach, and c) hysterical.[159] He stated that the way to determine between them was to eliminate conditions according to the presence or absence of other symptoms most associated with each disorder. Salter's first case, Eliza T., had no dyspeptic symptoms, and but one of the four main symptoms of gastric ulcer. Hysterical vomiting was therefore the most likely of these three possible causes, but this required verification. Salter turned to her case history.

Eliza T., aged 19 upon admittance to Charing-Cross, had been 'a healthy child, and had a colour; she was nervous and excitable, and easily made to cry or laugh.'[160] She had a good appetite, but was prone to vomiting without any warning. Her symptoms (vomiting, headache, pains in the lower back and abdomen, pain of the genitals, occasional paralysis of left arm, and a lump in her throat prior to vomiting) had severely worsened when menstruation began. She had vomited everyday in the past year, and her six week stay in the hospital was plagued with pain and numerous failed attempts at

[156] Shorter notices a rush of cases of hysterical vomiting in medical literature in the second half of the nineteenth century, reaching a 'crescendo' in the 1880s and 1890s. See Shorter, 'The First Great Increase', p. 77.
[157] See Salter H., 'Clinical Lecture on Hysterical Vomiting', *Lancet* (4th and 11th July 1868), pp. 1-2 and pp. 37-38.
[158] Salter, 'Clinical Lecture', p. 1.
[159] Salter, 'Clinical Lecture', p. 37.
[160] Salter, 'Clinical Lecture', p. 1.

treatment. Of particular importance to Salter was that 'she cannot be sick if a stranger is present; she is obliged to go away in order for the food to come up'.[161] Salter finalised his diagnosis of hysterical vomiting by concluding that it was compatible with nervous vomiting because 'there is no nausea, no warning of any kind, she never felt and never feels *sick* – the stomach simply empties itself.'[162]

Mental Strain, Deception and the Role of the Will

A fortnight later Salter was accused of skating over evidence in his cases, and a number of gynaecology specialists, such as Edward John Tilt (1815-93) and James Henry Bennet (1816-91), pointed to the potentially organic root of the vomiting.[163] In 1871 Tilt was clearly still agitated by Salter's lecture, writing that 'there was no intimation of the indissoluble connection of vomiting with the physiology and the pathology of the womb, and that vomiting cannot be called hysterical or nervous when it is explained by structural disease of the womb'.[164] In response to his critics Salter argued that he *had* performed an examination and found no evidence of disease. He then chose to reiterate the main point of his lecture: 'even if the examination had resulted in the discovery of some uterine mischief, it would not have affected my opinion […] A vomiting determined by the presence or absence of a stranger could hardly be that of organic disease.'[165] In other cases symptoms were triggered by different means, such as the idea of disgust, as in one patient who 'always thought of putrid cat-pudding when pressed to eat.'[166] Chronic hysterical vomiting was prompted in another girl by the 'dentist, who spit something in [the patient's] mouth whilst he was operating'.[167] Physicians also mentioned 'unusual mental strain' or some other psychological trauma as causes.[168]

[161] Salter, 'Clinical Lecture', p. 1 and p. 37.
[162] Salter, 'Clinical Lecture', p. 37. Salter also gives the case of C.B. – a 17 year old lady from Essex who presented with vomiting as her primary symptom. The cases resembled each other due to the lack of nausea. See p. 38.
[163] Tilt E.J., 'Hysterical Vomiting', *Lancet* (25th July 1868), p. 132; Henry Bennet J., 'Hysterical Vomiting', *Lancet* (29th August 1868), p. 296.
[164] Tilt E.J., 'On Hysteria and its Interpreters', *BMJ* (16th December 1871), p. 690.
[165] Salter H., 'Hysterical Vomiting', *Lancet* (1st August 1868), p. 164.
[166] Hewett P., 'Clinical Society of London', *BMJ* (1st November 1873), p. 528.
[167] Hale White W., 'Clinical Lecture on a Case of Severe Hysteria Treated by Massage Isolation, and Overfeeding', *BMJ* (30th July 1887), p. 232.
[168] Van Deth R. and Vandereycken W., 'Was Late-Nineteenth-Century Nervous Vomiting an Early Variant of Bulimia Nervosa?' *History of Psychiatry* (1995) **6**, p. 338; Salter, 'Clinical Lecture', p. 38; Bristowe J.S., 'Clinical Remarks on the Functional Vomiting of Hysteria', *Practitioner* (1883) **30**, p. 170.

The standard treatment of hysteria was undertaken in three stages: '(1) removing the reflex irritation from the uterine system with local treatment; (2) generally reducing the reflex excitability of the nervous system with baths and such; and (3) strengthening the patient's will to resist her bodily impulses.'[169] In cases of hysterical vomiting, re-nourishing the potentially emaciated patient was added to this list. A physician at St Thomas's Hospital, John Syer Bristowe (1827-95), author of numerous editions of the textbook *The Theory and Practice of Medicine* (1876), described the typical therapeutic process in one patient:

> She remained in the hospital for some time, suffering from what seemed to be extreme irritability of the stomach, which drugs failed to influence, and which was finally benefited, though not cured, by reducing the food administered by the mouth to a teaspoonsful [sic] of milk only, and by supplementing these by nutrient enemata.[170]

The third stage of treatment that was prominent in nineteenth-century literature on hysterical vomiting was a focus on strengthening the patient's will. Belief that the strength of the will could influence vomiting was also seen in cases of 'vomiting of habit', which, like hysterical vomiting, had no obvious bodily cause and appeared as 'a peculiar and unexplained morbid state'.[171]

The most prominent supporter of this idea was Henry Matthews Tuckwell (d. 1906), a physician at the Radcliffe Infirmary at Oxford. In 1873 Tuckwell distinguished 'vomiting of habit' as a condition in and of itself, disassociating it from the more frequently diagnosed condition of hysteria. Sufferers of this 'bad-habit' were 'as a rule: young, either sex; nervous temperament; quick, clever, irresolute; parents with

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[169] Shorter E., *From Paralysis to Fatigue: A History of Psychosomatic Illness in the Modern Era* (New York: The Free Press, 1992), p. 43. An example of a gynaecological treatment of hysterical vomiting is cited in Hewitt G., 'A Case of Hysterical Vomiting of Ten Months' Duration Caused by Displacement of the Uterus', *The Medical Press and Circular* (1880), p. 454. See also Van Deth and Vandereycken, 'Late-Nineteenth-Century Nervous Vomiting', p. 337. According to an 1881 *Lancet* article, vomiting stopped when a malposition of the uterus was corrected – see 'Middlesex Hospital: Hysterical Vomiting of Eight Months' Duration', *Lancet* (19th February 1881), p. 292. Salter used numerous anti-emetics and a shower bath, though he also complained about failure of these treatments, admitting that the only cure was to treat the hysteria itself. See Salter, 'Clinical Lecture', p. 38.

[170] Bristowe, 'Clinical Remarks', pp. 161-2. Patients were generally put on a diet of milk and beef-tea, encouraging them to retain nutritious food to prevent emaciation. Whilst Bristowe recorded gentle feeding, over-feeding was also employed on occasion. William Hale White (1857-1949) a senior assistant physician at Guy's hospital and prolific author, fed his patient all manner of foods. See Hale White, 'Clinical Lecture', p. 232 and Dutton E.G., 'A Severe Case of Hysteria, Cured by Massage, Seclusion, and Over-Feeding', *Lancet* (9th June 1888), pp. 1128-9.

[171] 'St. Thomas's Hospital: Chronic Vomiting', *Lancet* (6th August 1853), p. 114.

neurosis'.[172] Suggestion was the necessary therapeutic response. Tuckwell recommended changing the routine of the child, separating them from their parents (similar to the isolation employed for hysterical vomiting), introducing them to new faces and new influences, and not allowing them, for example, to go straight to the bathroom following dinner, as specific surroundings were prone to 'excite the act'.[173] In one case this involved a patient living with his physician, so it could be ensured that any stimuli of the condition were removed.[174]

Cases of 'vomiting of habit' were considered involuntary, but together with those of hysterical vomiting, demonstrate that many late nineteenth-century practitioners understood vomiting as a reflex action that could be initiated by a memory or disturbance of the mind, and combated by strengthening the will. The idea of the hysterical ungovernable reflex action was not unusual.[175] However, many alienists assumed there was a scale of hysteria from involuntary to voluntary.[176] In particular, a tendency had developed whereby reported symptoms of female patients were openly questioned. In Joan Brumberg's *Fasting Girls* the author discusses the concept of deception in women's loss of appetite, as so-called 'fasting girls' were labelled by emerging neurology specialists as 'perpetrators of outright deceit'.[177]

That females could be manipulative and utilise apparently uncontrollable reflex actions was often assumed in cases of hysterical vomiting. A clinical lecture on hysteria published in the *BMJ* in 1870 reported the case of 'Sarah G., aged 20, rather delicate and interesting looking,' who was admitted to St George's Hospital on 6th October 1869, and who had suffered for twelve months with almost constant vomiting, cough, and cold. The lecturer, John W. Ogle (1824-1905), was a consultant at the hospital. He

[172] Tuckwell H.M., 'On Vomiting of Habit', *BMJ* (22nd March 1873), p. 310. His reasons for believing the cases were not hysterical was that they included boys and girls before the age of menstruation, and all cases were cured by the same kinds of treatment. Tuckwell is also sure to disassociate vomiting of habit from cerebral disease, by the lack of pain or discomfort that precedes the vomiting act. For more on Tuckwell see 'Obituary. Henry Matthews Tuckwell', *BMJ* (17th March 1906), pp. 654-5.
[173] Tuckwell, 'On Vomiting of Habit', p. 310.
[174] Tuckwell, 'On Vomiting of Habit', p. 311.
[175] See for example the work on hysterical fits in Shorter, *From Paralysis to Fatigue*, pp. 96-102.
[176] Clark, 'The Rejection of Psychological Approaches', p. 294. Laycock wrote early in the nineteenth century that there were 'imposters' such as epileptics who could induce fits. Laycock, 'Analytical Essay', p. 65.
[177] Brumberg, *Fasting Girls*, pp. 50-1 and pp. 72-4. Active deception of medical practitioners using the symptoms of nausea and vomiting was not restricted (according to the profession) to just the needs of hysterical patients. In the case of morning sickness, doctors feared how easily women were able to deceive them regarding pregnancies, or lack thereof, by reporting nausea and vomiting. See Chapter Four of this thesis for more on this.

diagnosed a form of hysteria which Hall had labelled 'temper-disease' and in which 'the mental disposition of temper becomes perverted; there is disturbed equilibrium of the naturally well balanced moral faculties'.[178] The patient's refusal to take food, plus her sly manner dictated Ogle's diagnosis. He explained:

> The aspect and mien of the patient, the history of her previous symptoms, the constipation, tympanitis, the exquisite morbid impressionability, the deficient catamenia, and the constant vomiting without any ascertainable cause for it, and this vomiting *unaccompanied by nausea* [...] conspired to mark the case as one embracing, at any rate, much of the hysterical element.[179]

Ogle went on to qualify his textual emphasis, writing that 'when it is doubtful how much is hysterical in a given case, the absence of nausea may aid you in arriving at a right judgement,' drawing attention also to 'the forgetfulness of all her ailments on the occasion of the Queen passing the hospital and the affair of the new dress'.

Other physicians questioned their patients' reliability. London practitioner F.W. Parsons reported in one case of suspected hysterical vomiting that he had 'carefully watched' to ensure that there was no trickery involved.[180] Vomiting was also reported to have occurred with ease, as opposed to the forceful straining typical of the act, though one Bethlem patient was physically restrained as the medical officers suspected that the 'vomiting was caused by putting fingers down her throat.'[181] These reports of irrationality, control and potentially manipulative actions have encouraged some historians to regard hysterical vomiting as equivalent to the modern disease category of *bulimia nervosa*, but they have presented little or no evidence for the claim.[182]

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[178] Ogle J.W., 'Clinical Lecture on a Case of Hysteria; "Temper-Diseases", Hysterical (?) Congestion of the Lungs, and Persistent Vomiting', *BMJ* (16th July 1870), p. 57.
[179] Ogle, 'Clinical Lecture on a Case of Hysteria', p. 58.
[180] Parsons F.W., 'Case of Hysterical Vomiting and Sleeplessness', *BMJ* (6th August 1870), p. 138. Parsons also evidenced that she suffered from nausea, meaning she was less likely to have been deceptive.
[181] Van Deth and Vandereycken, 'Late-Nineteenth-Century Nervous Vomiting', p. 346 and Female patient casebook 1887, Inventory No. CB-133 Series Box No. A10/5. Bethlem Royal Hospital Archives & Museum. Thanks to Sarah Chaney for providing me with this reference.
[182] Shorter, 'The First Great Increase', pp. 69-96; Parry-Jones B. and Parry-Jones W.L., 'Self-Mutilation in Four Historical Cases of Bulimia', *British Journal of Psychiatry* (1993) **163**, pp. 394-402; Parry-Jones B. and Parry-Jones W.L., 'Bulimia: An Archival Review of Its History in Psychosomatic Medicine', *IJED* (1991) **10:2**, pp. 129-43; Habermas T., 'The Psychiatric History of Anorexia and Bulimia Nervosa: Weight Concerns and Bulimic Symptoms in Early Case Reports', *IJED* (1989) **8:3**, pp. 259-73; Casper R.C., 'On the Emergence of Bulimia Nervosa as a Syndrome: A Historical View', *IJED* (1983) **2:3**, pp. 3-16; Stein D.M. and Laakso W., 'Bulimia: A Historical Perspective', *IJED* (1988) **7:2**, pp. 201-10; Ziolko H., 'Bulimia: A Historical Outline', *IJED* (1996) **20:4**, pp. 345-8.

2.6 Conclusion

In many ways, the history of the physiology of nausea and vomiting in the nineteenth century follows that of pathology more generally. From looking for understandings in humors and fluids, to the role of the stomach, and afterwards the reflex-nervous system, by the end of the century doctors were focussing on the search for a specific anatomical location, the 'vomiting centre,' within the medulla oblongata. Moreover, a century later, following new research in the field of neurogastroenterology, the nervous system of the gut has begun to be questioned as 'The Second Brain'. Professor Michael Gershon, chairman of the Anatomy and Cell Biology department at Columbia University, writes that the gut 'is the only organ that contains an intrinsic nervous system that is able to mediate reflexes in the complete absence of input from the brain or spinal cord,' itself controlling simple movement, secretions and absorption in the gut.[183]

During the nineteenth century, however, changes in physiological models of nausea and vomiting had little impact on diagnostic and therapeutic practices, in which there were major continuities. Although Hall's reflex theory encouraged the classification of a number of different types of vomiting – local, central and peripheral – the task of distinguishing between them relied on clinical acumen and 'subjective' judgements. Research into the nervous system in the last decades of the century clarified the nature of spinal reflex activity, and the discovery of the neuron encouraged clearer understandings of pathological pathways.[184] However, the diagnosis of possible underlying pathologies does not appear to have improved in cases of vomiting. Furthermore, the explanations given by physicians, physiologists and pharmacologists for the action of emetics and anti-emetics were haphazard, and there was continued disagreement regarding which action – vomiting or not vomiting – was most beneficial.

The role of emotions and volition in nausea and vomiting was similarly unclear, and further added to a necessity for the 'subjective' interpretation of these signs and symptoms within the framework of reflex theory. Yet during the nineteenth century doctors adopted other diagnostic methods, independent of nervous theory, which were

[183] Gershon M.D., *The Second Brain: The Scientific Basis of Gut Instinct and a Groundbreaking New Understanding of Nervous Disorders of the Stomach and Intestines* (New York: Harper Collins, 1998), p. xiii.

[184] Clarke and Jacyna argue that the physiological research conducted by Charles Scott Sherrington (1857-1952) was applied much more practically to diagnosis than earlier neurophysiology, and enhanced clinicians' accuracy. Clarke and Jacyna, *Nineteenth-Century Origins*, pp. 155-6.

perceived as more quantitative than qualitative. It is the potential for vomited matters to be analysed quantitatively that I explore in the next chapter.

CHAPTER THREE:
VOMITED MATTERS IN CLINICAL DIAGNOSIS

3.1 Introduction

In mid August 1863 Charles Darwin endured yet another bout of chronic vomiting, which came on every morning for a fortnight.[1] Desperate for a diagnosis, he sent a slide of this vomit to John Goodsir (1814-67), Chair of Anatomy at the University of Edinburgh. With the slide Darwin enclosed a letter stating that during his own examination of the matters he had identified vegetable cells, seemingly wondering if they might be *sarcina*.[2] Goodsir responded that he would 'most willingly examine the slide; or, if not giving [Darwin] too much trouble, a small quantity of the fluid with the flocculent & tenacious matter sent in a tube or small phial.'[3] Darwin evidently complied and sent the larger sample, the analysis of which was returned to him shortly after, along with a sketched diagram and a slip of Litmus paper indicating its acidity.[4] Goodsir wrote that:

> I have obd. no *Sarcinæ* on it. The spherical bodies are *Torulæ* in various stages of development. The minute black atoms are evidently the result of decomposition, probably of biliary matter. I find also epithelial scales from the mouth, single [and] coherent, generally in the vicinity or attached to small masses of a filamentous aspect, and probably also from the mouth. There is nothing on the slide referable to the food.[5]

Darwin had chosen to consult Goodsir because he was 'someone skilled in such cases'; he had a reputation as an expert on microscopical investigations, and particularly the

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[1] *Darwin Correspondence Project Database,* http://www.darwinproject.ac.uk/entry-4274 (letter no. 4274; accessed 13th June 2011).
[2] *Darwin Correspondence Project Database,* http://www.darwinproject.ac.uk/entry-4272 (letter no. 4272; accessed 13th June 2011). In the primary literature *sarcina* and *sarcina ventriculi* are commonly italicised and in lower case. These words are only capitalised in this thesis when dictated by their presence in a primary quote. In Goodsir's original texts, the whole name is capitalised (i.e. SARCINA and SARCINA VENTRICULI).
[3] *Darwin Correspondence* (letter no. 4272). Flocculent refers to something resembling flocks or tufts of wool. Unfortunately, the letter Darwin initially sent to Goodsir has not been found.
[4] *Darwin Correspondence Project Database,* http://www.darwinproject.ac.uk/entry-4281/ (letter no. 4281; accessed 15th April 2010).
[5] *Darwin Correspondence Project Database*. http://www.darwinproject.ac.uk/entry-4278/ (letter no. 4278; accessed 18th January 2010). *Torula* was understood to be a type of yeast generally found in acidic stomach matters, often alongside *sarcina*.

role of s*arcina* in vomiting.[6] Indeed, in their initial communication, Goodsir had set out a great deal of information on the microorganism, including its role in morbidity and possible treatments. Acting on the tacit recommendation of Goodsir, Darwin also consulted George Busk (1807-86), former Hunterian Professor at the Royal College of Surgeons, editor of the *Quarterly Journal of Microscopical Science* and member of the X-Club.[7] Darwin's close friend, the botanist Joseph Dalton Hooker (1817-1911), also suggested he consult Busk, and wrote of him that he had 'the most fertile brain of any man I know in regard of all such matters as your stomach'.[8] Busk had, like Goodsir, published on *sarcina* in the early 1840s, and agreed that these organisms were not present in Darwin's vomit, theorising instead that he was suffering from water-brash (heartburn).[9]

This episode, as well as revealing the networks that Darwin drew upon in seeking relief from his chronic vomiting, demonstrates the medical and scientific interest there was in the biology and chemistry of vomit in the middle decades of the nineteenth century. In this chapter I focus on the increasing use of microscopy and laboratory methods in the analysis of vomited matters, to aid in the subjective interpretation of clinical signs and symptoms. Focussing on the history of *sarcina ventriculi* (a vegetable microorganism discovered in fermenting vomit by Goodsir in 1842), I show that rather than replacing or conflicting with the qualitative analysis that was the foundation of clinical methods, based on the physician's senses and macroscopic inspection, laboratory findings and quantitative techniques were used to complement these analyses.

Firstly, building on the previous chapter, I consider how common medical practices encouraged vomited matters to be analysed macroscopically in bedside and hospital clinical diagnoses. These qualitative analyses were made in order to compensate for the complexities that surrounded the presence of nausea and vomiting, which could signal

[6] *Darwin Correspondence* (letter no. 4274).
[7] *Darwin Correspondence* (letter no. 4272). The X-Club was an informal scientific body, particularly supportive of the theory of Natural Selection and academic liberalism. See MacLeod R., 'The X-Club: A Social Network of Science in Late-Victorian England', *Notes and Records of the Royal Society of London* (1970) **24:2**, pp. 305-22 and Barton R., '"Huxley, Lubbock, and Half a Dozen Others": Professionals and Gentlemen in the Formation of the X Club, 1851-1864', *Isis* (1998) **89:3**, pp. 410-44.
[8] *Darwin Correspondence Project Database*. http://www.darwinproject.ac.uk/entry-4276 (letter no. 4276; accessed 9th June 2011).
[9] Browne J., *Charles Darwin: The Power of Place* (New Jersey: Princeton University Press, 2002), p. 228; *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry4315 (letter no. 4315; accessed on 16th September 2011). Busk had written a paper on its presence in the stomach whilst surgeon to the Dreadnought. See Busk G., 'On the Occurrence of *Sarcina Ventriculi* in the Human Stomach', *Microscopic Journal* (1842) **2**, pp. 321-3.

at one end of the scale, mild, temporary disorders, such as stomach upsets, while at the other end, serious, acute or chronic, terminal illnesses, such as stomach cancer. At the core of this chapter is the story of the 'discovery' of *sarcina* and complex debates about whether it was the cause, consequence or concomitant of vomiting, and the extent to which it could indicate a specific disease or type of vomiting. Finally, I look at the chemical analysis of vomit occurring in hospital laboratories in the latter decades of the nineteenth century, amidst interest in the process of digestion and the identification of poisons. I question how these techniques contributed to diagnoses in everyday cases of vomiting, at a time when bacteriological identification of infectious diseases was a growing practice.

3.2 The Subjective Interpretation of Symptoms

The Diagnostic Value of Nausea and Vomiting

As demonstrated in the previous chapter, nausea and vomiting were complex and potentially misleading signs and symptoms; they could equally signal innocuous disorders, chronic internal dysfunctions or acute infectious diseases. Following the theorisation of the body's reflex action by Marshall Hall during the 1830s, nausea and vomiting were increasingly disconnected from the stomach and regarded as possible responses to disease and disorder in any part of the body.[10] Doctors were thus required to interpret the nature and manner of the presentation of nausea and vomiting to gain some indication of their origin. However, by the last quarter of the nineteenth century the American author of a *Medical Diagnosis* textbook, Jacob Mendes Da Costa (1833-1900), wrote that '[c]onnected thus with so many various conditions, the act of vomiting, taken by itself, is of little diagnostic value'.[11] Da Costa's view is certainly representative of physicians' as a whole, and shows continuity in symptomatology throughout the nineteenth century. Practitioners faced with this difficulty increasingly looked to the qualitative features and quantitative properties of the *products* of nausea

[10] In addition to Chapter Two of this thesis see: Handford H., 'Vomiting as a Symptom', *Provincial Medical Journal (Leicester)* (1st December 1888), pp. 530-3; Ewart W., *Symptoms and Physical Signs: A Formulatory for Clinical Note-Taking with Examples* (London: Ballière, Tindall and Cox, 1892), pp. 80-1; Bury J.S., *Clinical Medicine: A Manual for the Use of Students and Junior Practitioners* (London: Charles Griffin and Company, 1894), pp. 21-3; Hare H.A., *Practical Diagnosis: The Use of Symptoms in the Diagnosis of Disease* (London: Henry Kimpton, 1897), pp. 471-94.

[11] Da Costa J.M., *Medical Diagnosis with Special Reference to Practical Medicine. A Guide to the Knowledge and Discrimination of Diseases*, 5th edn (London: Smith, Elder, & Co., 1881), p. 453. This textbook was first published in 1864 and ran into its 9th edition in the early twentieth century.

and vomiting to inform their diagnoses. Vomited matters became the focus of both the clinical and laboratory gaze around the mid nineteenth century.

Vomited Matters: Collecting, Saving and Sharing

At the turn of the nineteenth century vomited matters represented excess humors expelled from the body and could be a positive sign of the restoration of a healthy constitutional balance. Increasingly a 'new humoralism' substituted the old; theories of epidemic disease relied on the hypothetical or realised pathological nature of fluids.[12] But what *was* vomited matter? In his 1856 textbook Andrew George Malcolm expressed the common view that vomited matter was the physical expression of both nausea and vomiting, of which 'the former express[ed] but a minor degree of the latter state'.[13] Descriptions of what this comprised varied in detail. The most simplistic followed that it 'consists of the contents of the stomach and sometimes of the duodenum' which had been forcibly ejected from the stomach.[14] The stomach contents were generally 'food-constituents in various stages of digestion, mixed with gastric juice, the secretions from the nose and mouth, and frequently also with bile. Other materials, as blood, may also be present.'[15]

The centrality of vomiting and vomited matters in the nineteenth-century clinical encounter is clear. In 1892 the physician William Ewart (1848-1929) recommended that practitioners use the abbreviations of 'V^{g}' and 'V^{t}' (signifying vomiting and vomited matters respectively) in clinical note-taking.[16] This teaching represented the culmination of common practices. It is difficult, however, to distinguish specific trends in how vomited matters were used in clinical diagnoses, particularly in the earlier decades. We can presume from their frequent, almost habitual, descriptions in early nineteenth-century reports that practitioners were alert to the visual aspects of their patients' vomit. During the course of the nineteenth century emphasis on saving these bodily products

[12] Particularly the blood. Pelling M., *Cholera, Fever and English Medicine, 1825-1865* (Oxford: Oxford University Press, 1978), p. 16.
[13] Quote from Malcolm A.G., *An Introduction to Clinical Study, or, An Interpretation of Symptoms and Signs* (Belfast: Henry Greer, 1856), p. 81. For more on Malcolm see Logan J.S., 'The Working Man of the Profession', *Ulster Medical Journal* (1974) **43:1**, pp. 22-32.
[14] Brown J.J.G., *Medical Diagnosis: A Manual of Clinical Methods* (Edinburgh: Bell & Bradfute, 1882), pp. 31-2, quote p. 32.
[15] Bury, *Clinical Medicine*, p. 268.
[16] Ewart, *Symptoms and Physical Signs*, p. xiii. Ewart is remembered for his description of the physical examination of patients suffering from fluid collection around their hearts, know as 'Ewart's Sign'. See 'Obituary. William Ewart', *BMJ* (24th August 1929), pp. 369-70.

grew, particularly for assistance in unusual cases. For example, the preservation of vomit for inspection in all 'cases of suspected poisoning, and when the vomiting is of an obscure character,' was recommended in a standard student textbook, the *Clinical Manual for the Study of Medical Cases*, edited by James Finlayson (1840-1906) of the Glasgow Western Infirmary, in 1878.[17]

In some cases this involved going to somewhat extreme lengths. In the late 1870s James More, a general practitioner from Rothwell in Northamptonshire, decided it was so important that vomit samples be secured he wrote that although '[t]he patient lived five miles from my house […] I had specimens of the ejected matter brought me from time to time. Nine of these I retained, each in a covered pit by itself.'[18] More's methods show how practitioners could utilise vomited matters for diagnostic purposes without having any first-hand interaction with the patient; the nature of vomit samples meant that the product of illness could be removed entirely from the situation in which it was produced. This was also evident in the case described in the opening of this chapter, as the correspondence between Darwin and Goodsir shows that a meeting of patient and practitioner was unnecessary.

When the vomited matters were not saved, a description of them could equally assist diagnosis. In 1851 a vital lead was triggered in an out-patient case by a description of the vomited matters given by the patient's wife, which she described as frothing over the top of the container, and yeast-like.[19] Presumably she had been prompted into describing the vomit by the practitioner when she came in to collect her husband's medicines. Similarly, the word of a nurse who had suggested her patient's vomited matters had the appearance of 'beaten-up rotten eggs,' was given significance in a report in the *BMJ* in 1875, and was taken to mean that it was a case of intestinal pustule.[20]

The visual characteristics of vomited matters were not the only quality of interest to practitioners, and diagnosis was also aided by knowledge of the amount that had been vomited. Nurses, for instance, were taught to preserve specimens of all vomit for the

[17] Finlayson J., *Clinical Manual for the Study of Medical Cases* (London: Smith, Elder, & Co., 1878), p. 326.
[18] More J., 'On the Sarcina Ventriculi (of Goodsir)', *Lancet* (4th January 1878), p. 7.
[19] 'Critical Digest of the British and Foreign Medical Journals', *London Journal of Medicine* (November 1851), p. 1038.
[20] 'Reports of Societies', *BMJ* (13th March 1875), p. 361.

doctor, having measured its quantity.[21] This further helped to moderate any potential embellishment of the quality and quantity of vomited matters reported by the suffering individual. Indeed, it is likely that many practitioners agreed with Paul Henry Stokoe of Guy's Hospital, who wrote in 1875 that 'careful examination of all ejected matters should be made in order to correct the natural exaggeration, and estimate at their true value the statements of the sufferer.'[22]

Saving vomited matters in suspected poisoning cases served an additional purpose to that of medical diagnosis; the ejecta could contain remnants of the poison used, helping to determine if a crime had been committed. The vomited matters in such cases may have been saved after the attack of vomiting, as in ordinary cases of illness. Evidence in a high-profile case from 1881, in which a medical practitioner named George Henry Lamson was tried for the murder by poison of his brother-in-law, Percy Malcolm John, included: 'About five ounces of semi-solid vomit, collected from the floor of the bath-room, the pan of the water-closet, and a basin in the bedroom,' which were then 'subjected to examination by nose and eye, with the aid of lens and microscope.'[23] Alternatively, as it was common practice to administer emetics therapeutically in poisoning cases, the results of this may have been inspected. This method presented problems, however, as emetics were not always successfully employed; for instance, opium made the stomach unresponsive to the stimulation of emetics.[24] In such situations practitioners could turn to the stomach-pump, a technology of artificial vomiting, for removal of the victim's stomach contents. For this purpose, the provincial doctor Wilbraham Falconer of Bath (1816–81) designed a stomach pump with an attached glass reservoir, which could be removed, sealed and sent directly for testing in a laboratory.[25]

[21] Lewis P.G., *Nursing: Its Theory and Practice, being a Complete Textbook of Medical, Surgical and Monthly Nursing* (London: The Scientific Press, 1899), p. 63.
[22] Stokoe P.H., 'Practical Remarks on the Causes and Treatment of Some Common Forms of Vomiting', *Guy's Hospital Reports* (1875) **20**, p. 491.
[23] Stevenson T., 'Poisoning by Aconitine (Case of Reg. *v.* Lamson.)', *Guy's Hospital Reports* (1882) **41**, pp. 308-27, quotes p. 315.
[24] Jackson W.A., *The Invention of the Stomach Pump, and its Development in the Nineteenth Century*, Unpublished MSc Thesis (University of Manchester, 1996), p. 175.
[25] Jackson, *The Invention of the Stomach Pump,* p. 235.

Macroscopic Analysis

In ordinary cases, once a doctor was in possession of a patient's vomited matters, their initial examination was qualitative and macroscopic, based on the characteristics of the ejecta as a whole. It consisted primarily of identifying the constituents of vomited matters, with practitioners habitually referencing 'food, mucus, bile, and blood'.[26] Practitioners' analyses also considered colour, texture, quantity and odour. Such descriptions were not standardised and typically varied in detail, though all employed predominantly subjective terminology. For instance a physician to the Middlesex Hospital, John Wilson, recounted a case admitted in 1836 of a woman who had retained sulphuric acid in her stomach for quarter of an hour, dying twenty-two hours later.[27] She initially vomited 'a black ropy fluid,' which was subsequently followed by 'a fluid of the consistence of treacle and colour of the carbonate of iron.'[28]

Physical diagnosis methods of the early nineteenth century, including palpation and the new auscultation, had come to centre evidence of illness on practitioners' senses rather than reported signs and symptoms.[29] In addition to the technical skills required of practitioners using new instruments, as Malcolm Nicolson has demonstrated of the introduction of stethoscopy at this time, the success of these methods depended on the ability of practitioners to interpret their senses.[30] The analysis of vomited matters typified this diagnostic trend and relied, mostly, on sight and smell. Nonetheless, certain characteristics could usefully be verified by the patient's narrative, particularly the acidic nature of the matters. The case of Margaret Lauder showed how the doctor's visual interpretation could be strengthened by a patient's report. In 1845 Lauder was admitted to the Meath Hospital with suppression of menstruation, obstinate vomiting and stomach pain. During a clinical lecture Lauder's attending physician, Robert James Graves (1796-1853), commented that '[t]he fluid ejected from the stomach, which is

[26] Hall M., *An Essay on the Symptoms and History of Diseases; Considered Chiefly in their Relation to Diagnosis* (London: Longman, Hurst, Reese, Orme, and Brown, 1822), p. 113.
[27] Wilson J., 'Results of Poisoning by Sulphuric Acid,' *Medical and Chirurgical Transactions* (1838) **21**, p. 274.
[28] Wilson, 'Results of Poisoning', p. 275. The colour and consistency of the vomited matters in this case were suggestive of morbidity within the stomach, and acted as confirmation of poisoning.
[29] For a history of the eighteenth-century use of senses in medicine see Lawrence S.C., 'Educating the Senses: Students, Teachers and Medical Rhetoric in Eighteenth-Century London', in Bynum W.F. and Porter R. (eds), *Medicine and the Five Senses* (Cambridge: Cambridge University Press, 1993), pp. 154-78.
[30] Nicolson M., 'The Introduction of Percussion and Stethoscopy to Early Nineteenth-Century Edinburgh', in Bynum and Porter, *Medicine and the Five Senses*, pp. 134-53.

extremely sour, and as she states, "sets her teeth on edge," is of various colours; green, yellow, grey, whitish, but never black.'[31] Grave's main concern, as was typical of practitioners when presented with vomiting patients, was to determine whether there was an organic affection of the stomach; in this case the vomited matters provided evidence for the fact that it was not so. Having never been tinged with blood, coloured black, or consisting of a coffee-grounds like substance (blood), Graves concluded that there was no organic lesion of the stomach, as this would have produced an erosion of the mucous coat, and therefore an 'oozing of blood from the eroded surface.'[32] Furthermore, the extreme acidity of the vomit was considered as additional evidence that the condition was functional, explained by the secretion of an excess of stomach acid.

There were several other common conclusions drawn from the macroscopic analysis of vomit. The presence of bile indicated a hepatic derangement or relaxation of the duodenum (resulting in accumulation of bile or anti-peristalsis). If the patient suffered 'sudden, uncontrollable, and *painful* vomiting of mucus or acid frothy watery matters,' then the practitioner was taught to suspect poisoning. Colours and familiar smells were also found to be particularly useful in cases of suspected poisoning.[33] Vomit samples containing 'dark granular masses, like tea-leaves and grounds' were suggestive of cancer, and 'rice-water' vomit was the standard description given in association with Asiatic cholera.[34] Provincial practitioners encountering the disease in their localities also discussed the potential for English cholera to be distinguished by the initial purging being recognised as bilious fluid. However, once this matter had been ejected and the alimentary canal emptied, the material subsequently rejected would be colourless; the vomit of suspected cholera patients was therefore ultimately considered of little diagnostic value.[35] On the whole, however, observation was central to early methods of

[31] 'Clinical Lecture on Medicine, Delivered at the Meath Hospital, by Robt. J. Graves, M. D., M. R. L. A., &c', *MTG* (April-September 1845) **12**, p. 261. Graves was a keen practitioner of bedside teaching and his clinical lectures in Dublin were very popular. For more see 'Obituary [Robert Graves]', *MTG* (January-June 1853) **6**, p. 351.
[32] 'Clinical Lecture on Medicine', p. 261. This evidence was used in conjunction with the patient's reported history of tenderness and pain in the epigastric region.
[33] Malcolm, *An Introduction to Clinical Study*, p. 90. See also Paget Blake C., 'Case of Poisoning by Stramonium', *St George's Hospital Reports* (1868) **3**, p. 161.
[34] Malcolm, *An Introduction to Clinical Study*, p. 89.
[35] Salter T., 'Diagnosis of Indian and English Cholera', *Provincial Medical and Surgical Journal* (8th October 1842), pp. 32-3 and Salter T., 'Diagnosis of Indian and English Cholera', *Provincial Medical and Surgical Journal* (5th November 1842), pp. 110-1.

vomit analysis, and although descriptions were subjective, there were clear frameworks for their interpretation.

3.3 From Qualitative to Quantitative

The Impact of Microscopy

From the 1830s microscopy was increasingly being used as a tool in diagnosis, following an 'interest in the finer structure of the body' in early nineteenth-century histological investigation, and a move away from earlier scepticisms regarding the aberration of images seen through microscopes.[36] From the 1840s its employment in clinical medicine was increasingly reported by doctors. Various bodily components were subjected to microscopic examination, including blood, urine, sputum, skin and faeces.[37] Products of disease, such as phlegm from the lung, were thought to be evidence of tissue destruction and therefore of how the basic 'architectural features' of the body were being transformed by the illness, cancer cells being arguably the best illustration of this.[38] From the 1850s microscopic analysis of vomited matters came to be standard in clinical teaching.[39]

Although knowledge about the microscopic characteristics of vomited matters was taught from the mid nineteenth century onwards, microscopic techniques were not widely adopted in practice and were generally only 'employed to advantage by […] the most progressive pathologists.'[40] Microscopes at this time were laboratory instruments in the sense that the 'laboratory' in a general practitioner's surgery was a side-table or shelf in an alcove and in a hospital was at best a side room or, more typically, a similar table in an office. In these areas clinical pathology would be conducted by junior housemen, or the doctor himself would perform chemical tests and keep specimens.[41]

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[36] See Bracegirdle B., 'The Microscopical Tradition', in Bynum W.F. and Porter R. (eds), *Companion Encyclopaedia of the History of Medicine* (London: Routledge, 1993), p. 104 and Reiser S.J., *Medicine and the Reign of Technology* (Cambridge: Cambridge University Press, 1978), p. 76.
[37] Foster W.D., *A Short History of Clinical Pathology* (Edinburgh and London: E. & S. Livingstone Ltd., 1961), pp. 30-1.
[38] Reiser, *Medicine*, p. 77.
[39] Foster, *A Short History of Clinical Pathology*, p. 24. By general Foster referred to the lack of differentiation between functions of specialists – histologists, haematologists, parasitologists and bacteriologists. He refers specifically here to the microscope department at Guy's Hospital.
[40] Foster, *A Short History of Clinical Pathology*, p. 14.
[41] For more on how this changes see Vernon K., 'Pus, Sewage, Beer and Milk: Microbiology in Britain, 1870-1940', *History of Science* (1990) **28**, pp. 289-325.

The ‘progressive’ possibilities for analysis of vomit were, however, exemplified by London’s ‘most enthusiastic clinical microscopist’ Lionel Beale and set out in his work on *The Microscope and Its Application to Practical Medicine*, first published in 1854 and reprinted regularly until 1878.[42] In a section which dealt with a variety of bodily fluids (including blood, milk, serous fluid, sputum, vomit, bowel substances, discharges from the uterus and vagina, and pus), Beale described how to prepare and examine vomit samples. He recommended taking several specimens from different parts of the vomit, as the vast number of substances it contained were often separated from each other: ‘[p]ortions may be removed upon the point of a knife; by the pipette if the vomit be very fluid; and with the aid of scissors and forceps, if it be very viscid.’[43] Vomited matters, Beale wrote, ‘always contain fragments of vegetable and animal tissues, which have been taken as food, more or less altered by the processes of digestion.’[44] He referred also to blood globules, which gave the appearance of ‘coffee-ground vomit’, and the floculli (containing various epithelium cells) that characterised the ejecta of cholera victims.[45]

In 1857 John Hughes Bennett (1812-75), the first practitioner in Britain to systematically teach histology, complained that ‘[t]he matters rendered by vomiting have not been made so frequent an object of microscopical observation as is necessary, with a view to diagnosis.’[46] His complaint demonstrates the lag between publication and acceptance of vomit analysis methods. Nonetheless, the subjective description of vomited matters was being translated into more objective characterisations of types of vomiting. The key representation of this move was Goodsir’s *sarcina.* Indeed, it is the only illustration relating to vomited matters in Beale’s first edition of *The Microscope*, where it was reported that this vegetable fungus had been ‘found by a great many observers, and, [could] be looked upon as by no means uncommon.[47] Beale, however, placed *sarcina* under a heading of ‘algæ’ rather than vomiting, due to the fact that it had been found in numerous other situations by this time. Figure 4, below, shows Beale’s first edition representation of *sarcina*.

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[42] Foster, *A Short History of Clinical Pathology*, p. 27.
[43] Beale L., *The Microscope and Its Application to Practical Medicine* (London: Samuel Highley, 1854), p. 235.
[44] Beale, *The Microscope*, p. 235.
[45] Beale, *The Microscope*, p. 236.
[46] Bennett J.H., *An Introduction to Clinical Medicine*, 3rd edn (Edinburgh: Adam and Charles Black, 1857), p. 124. See ‘Obituary. John Hughes Bennett’, *BMJ* (9th October 1875), pp. 473-8.
[47] Beale, *The Microscope*, p. 175. *Sarcina* had also been found by this stage in urine, abscess of the lung and fluid ventricles of the brain (p. 176).

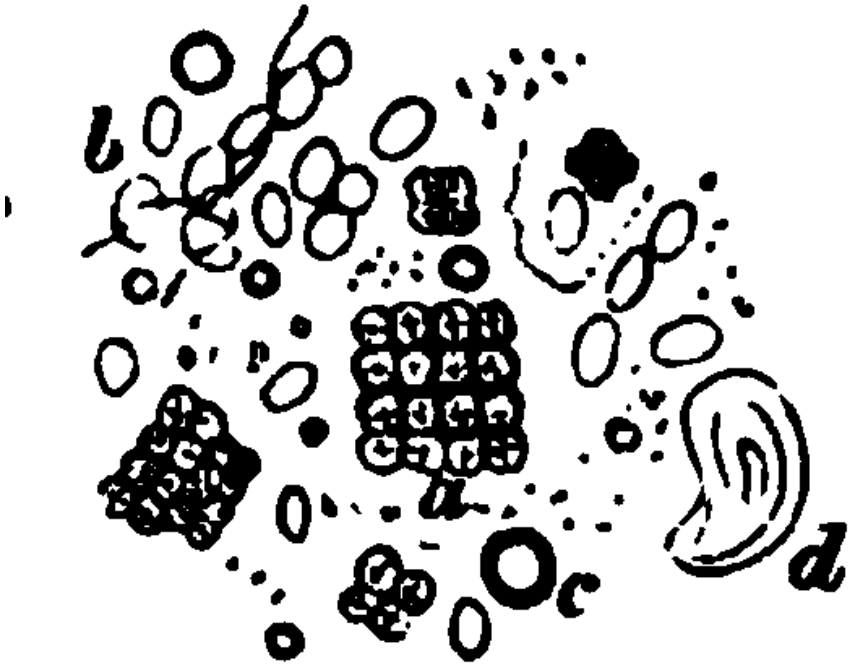

Figure 4. Beale's image of *sarcina*

Source: Beale L., *The Microscope and Its Application to Practical Medicine* (London: Samuel Highley, 1854), p. 175.

By the third edition of *The Microscope* (1867), however, Beale had introduced diagrams of three vomit samples, including a healthy sample, a case of suspected cancer and an example of *sarcina*, as Figure 5, below, shows.

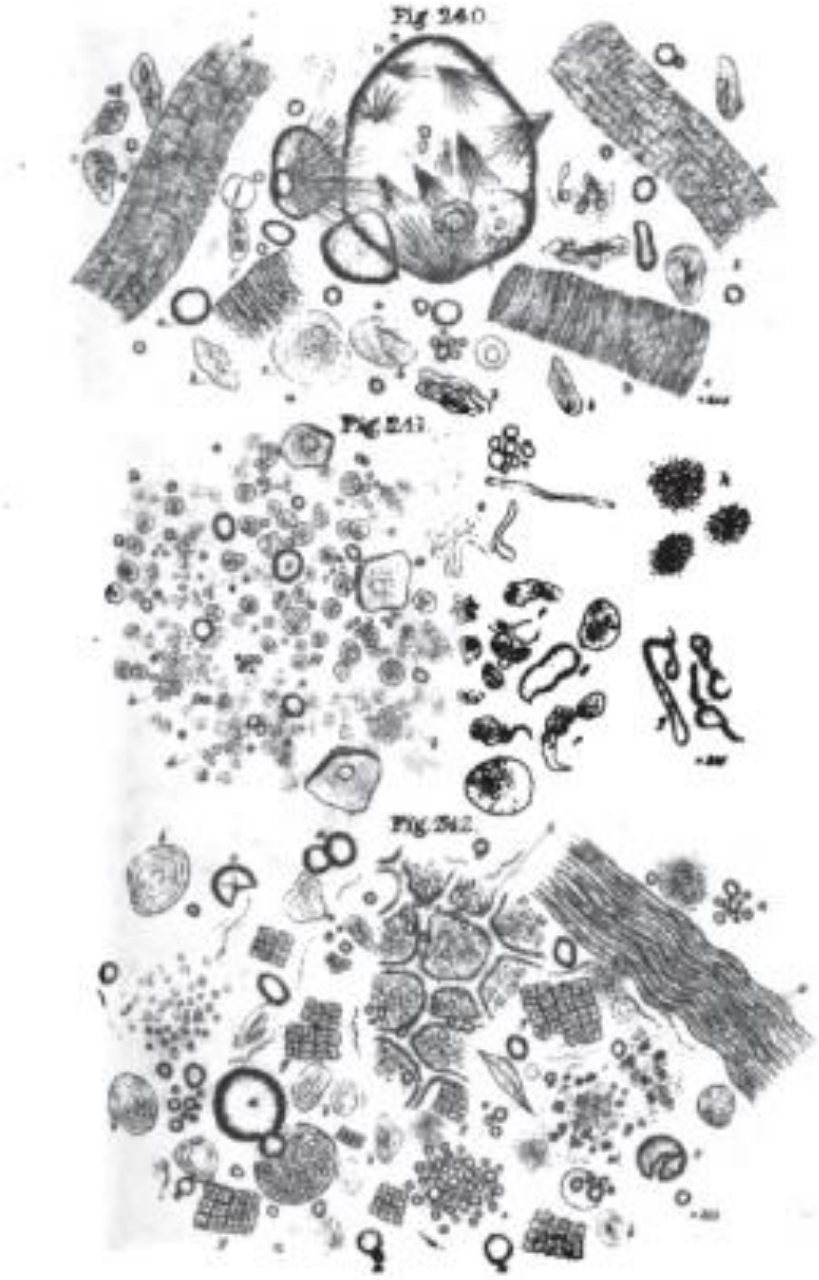

Figure 5. Three vomit samples: healthy vomit (top), suspected cancer (middle), sarcinous vomiting in a case of dilated stomach (bottom)

Source: Beale L., *The Microscope and Its Application to Practical Medicine*, 3rd edn (London: John Churchill & Sons, 1867), p. 191.

In these early years of microscopic analysis of vomited matters, how and why did *sarcina* gain such prominence in diagnostic literature?

The Discovery of Sarcina *by Goodsir*

Goodsir was an anatomist, pathologist, and one of four individuals central in introducing microscopy practices into Edinburgh.[48] He began as an apprentice to a dentist and this was reflected in his first published work, 'On the origin and development of the pulps and sacs of the human teeth' (1839).[49] By the time this was published his interests in anatomy and pathology had encouraged him to move away from dentistry as such, and he had taken up studies at the Edinburgh College of Surgeons. He gained his surgical licence in 1835.

In 1842 Goodsir was 'confirmed […] as an innovative scientific observer' after his description and naming of the microorganism *sarcina ventriculi*.[50] His report was published in the *Edinburgh Medical and Surgical Journal*, and gave an account of a nineteen year old man thought to be suffering from water-brash. He wrote that it

> attacked him on awakening in the morning with a feeling of distension of the stomach; that, without any effort of vomiting, a quantity of fluid, varying in volume from two-thirds to a whole wash-hand basonful [sic], passed up from his stomach: that after this he was quite relieved, and experienced no further inconvenience till the evening of the same day, when, without decided distension, sounds as of a fluid boiling or

[48] Jacyna L.S., '"A Host of Experienced Microscopists": The Establishment of Histology in Nineteenth-Century Edinburgh', *BHM* (2001) **75:2**, pp. 227-9. The others were Allen Thomson (1809-84), William Sharpey (1802-80) and John Hughes Bennett (1812-75). It is not clear where Goodsir developed his skills in these techniques. Rudolf Virchow (1821-1902) dedicated his first English translation of *Cellular Pathology* to Goodsir in 1860, though Goodsir's supporters believed that Virchow did not acknowledge the extent of the debt owed to him, who they claimed had first expounded the notion that cells developed only from the nuclear matter of other cells. See Virchow R., *Cellular Pathology, as Based upon Physiological and Pathological Histology*, Chance F. (trans.) (London: John Churchill, 1860), cited in Jacyna L.S., 'John Goodsir and the Making of Cellular Reality', *Journal of the History of Biology* (1983) **16:1**, p. 75.

[49] See Grudzien Baston K., 'Goodsir, John (1814–1867)', *Oxford Dictionary of National Biography* (Oxford University Press, 2004) [http://www.oxforddnb.com/view/article/10983; accessed 9th June 2011].

[50] Quote from Grudzien Baston, 'Goodsir, John'. Water-brash is defined by the Oxford English Dictionary as 'an eructation or belching of water (acid, bitter, etc.) from the stomach, pyrosis.' See entry in *Oxford English Dictionary Online* [http://www.oed.com; accessed 15th April 2010]. By the time that he was consulted about Darwin's stomach ailments, Goodsir had suffered ill-health for a number of years; by the 1860s his work was predominantly restricted to lecturing and publishing.

> bubbling, and proceeding from the region of his stomach, were perceptible to himself and those around him.[51]

Goodsir's report thus began, and continued, with a description of signs and symptoms relating to the patient's pattern of vomiting, state of his tongue, pulse, headache, nausea, and thirst. He also determined that there was no tumour in the epigastrium, and that the bowels and appetite were normal.[52] On the basis of these findings and the relief offered previously by the use of prussic acid, Goodsir determined that his patient was likely suffering ulceration or an organic lesion of the stomach. Yet no clear diagnosis could be made and no tailored therapy was offered. Goodsir therefore requested that a sample of the ejected fluid be preserved for him to inspect.

Goodsir observed that his patient's vomit had the smell of 'fermenting worts, with a faint acid odour'.[53] He also noted that after standing for several hours its appearance was 'moderately transparent, and of a light brown colour,' with granular sediment at the bottom and froth on its surface 'like the head of a pot of porter.' Consequently, Goodsir concluded that there must be fermentation occurring within the stomach, and recalled that 'in the meantime, till I had examined the fluid more minutely, I merely regulated my patient's diet.'

On inspection of the vomited matters Goodsir had expected to find fermentation due to globular or moniliform algae. Instead, upon turning to microscopy, he declared:

> What was my astonishment then to find, in the first drop I examined, not the vegetables I was led to expect, but numerous individuals of a form, with allies of which the zoologist is familiar! Drop after drop exhibited the same specific form, with a precision which convinced me that I had now to deal with an organism which, whether animal or vegetable, was closely allied to certain genera of BACILLARIE, and much more closely to the genus GONIUM among the VOLVOCINE.[54]

[51] Goodsir J., 'History of a Case in which a Fluid Periodically Ejected from the Stomach contained Vegetable Organisms of an Undescribed form; with a Chemical Analysis of the Fluid, by George Wilcox', *Edinburgh Medical and Surgical Journal* (1842) **57**, p. 430.
[52] Goodsir, 'History of a Case', p. 430.
[53] Goodsir, 'History of a Case', p. 431.
[54] Goodsir, 'History of a Case,' p. 431. Gonium was considered a genus of algae, Volvocine being the order of which it was a member.

Goodsir was both astounded and confused by what he saw, questioning its nature, production and similarities to both bacteria and algae. Subsequently, he employed his colleague George Wilson (1818-59), an Edinburgh chemist, to conduct further tests upon his patient's vomit. Together, Goodsir and Wilson concluded that the organisms were vegetable fungi.

The 'vegetable organisms' had, according to Goodsir, 'striking peculiarities of form' which he described in detail.[55] They were shaped as a square, with rounded angles which, he wrote, 'gave the whole organism the appearance of a wool-pack, or of a soft bundle with cord, crossing it four times at right angles, and at equal distances.' He observed in them what he called a 'beautiful symmetry,' with each one dividing into four.[56] They were generally brownish-green, but sometimes almost colourless.[57] Goodsir named the genus *sarcina*, and the species *sarcina ventriculi*, the term coming from the Latin word for wool pack. Figure 6 (below) shows the images of *sarcina* that Goodsir produced with his initial publication.[58]

The distinctive appearance of *sarcina* meant that it was readily communicated to readers of journals and students via textbooks, and the ease with which the organism could be identified was often commented upon.[59] Indeed, shortly after its naming and description, *sarcina* received much attention in medical texts, particularly in pictorial form. Figures 7 and 8, over the following pages, demonstrate that *sarcina* was a common illustration in textbooks and journals during the second half of the nineteenth century.

[55] Goodsir, 'History of a Case', p. 434.
[56] Goodsir, 'History of a Case', p. 435.
[57] Liddon E., *Thesis on Vomiting of Sarcinæ and Torulæ*, Unpublished MD Thesis (Edinburgh, 1853-4), p. 9.
[58] Goodsir was well known for using histological illustrations in his teaching.
[59] Malcolm, *An Introduction to Clinical Study*, p. 90; Steven J.L., *Practical Pathology* (Glasgow: James Maclehouse & Sons, 1887), p. 159; Jaksch R., *Clinical Diagnosis* (London: Charles Griffin and Company, 1890), p. 108; Goodsir, 'History of a Case', p. 434.

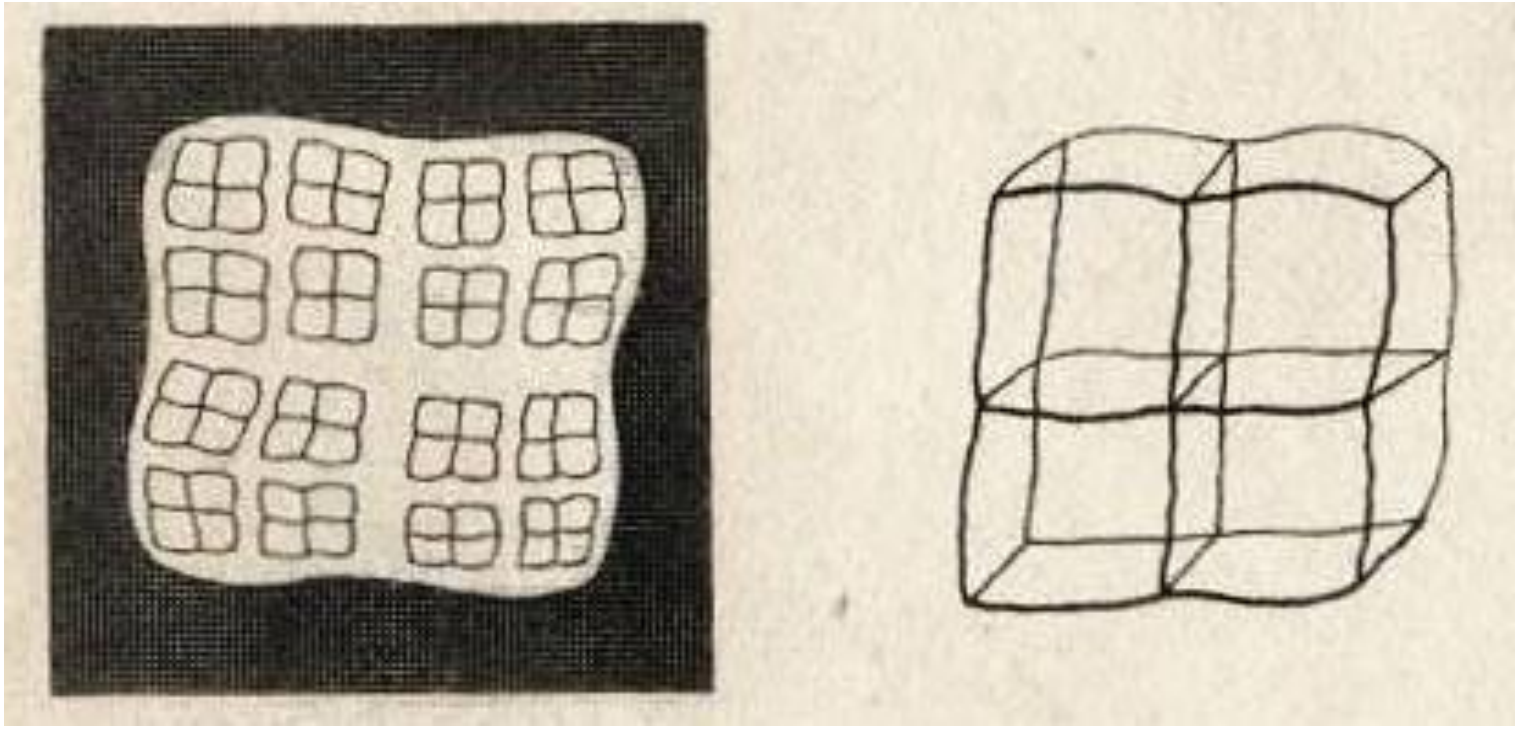

Figure 6. The wool pack formation of Goodsir's *sarcina*

Source: Goodsir J., 'History of a Case in which a Fluid Periodically Ejected from the Stomach contained Vegetable Organisms of an Undescribed form; with a Chemical Analysis of the Fluid, by George Wilcox', *Edinburgh Medical and Surgical Journal* (1842) **57**, unpaginated plate.

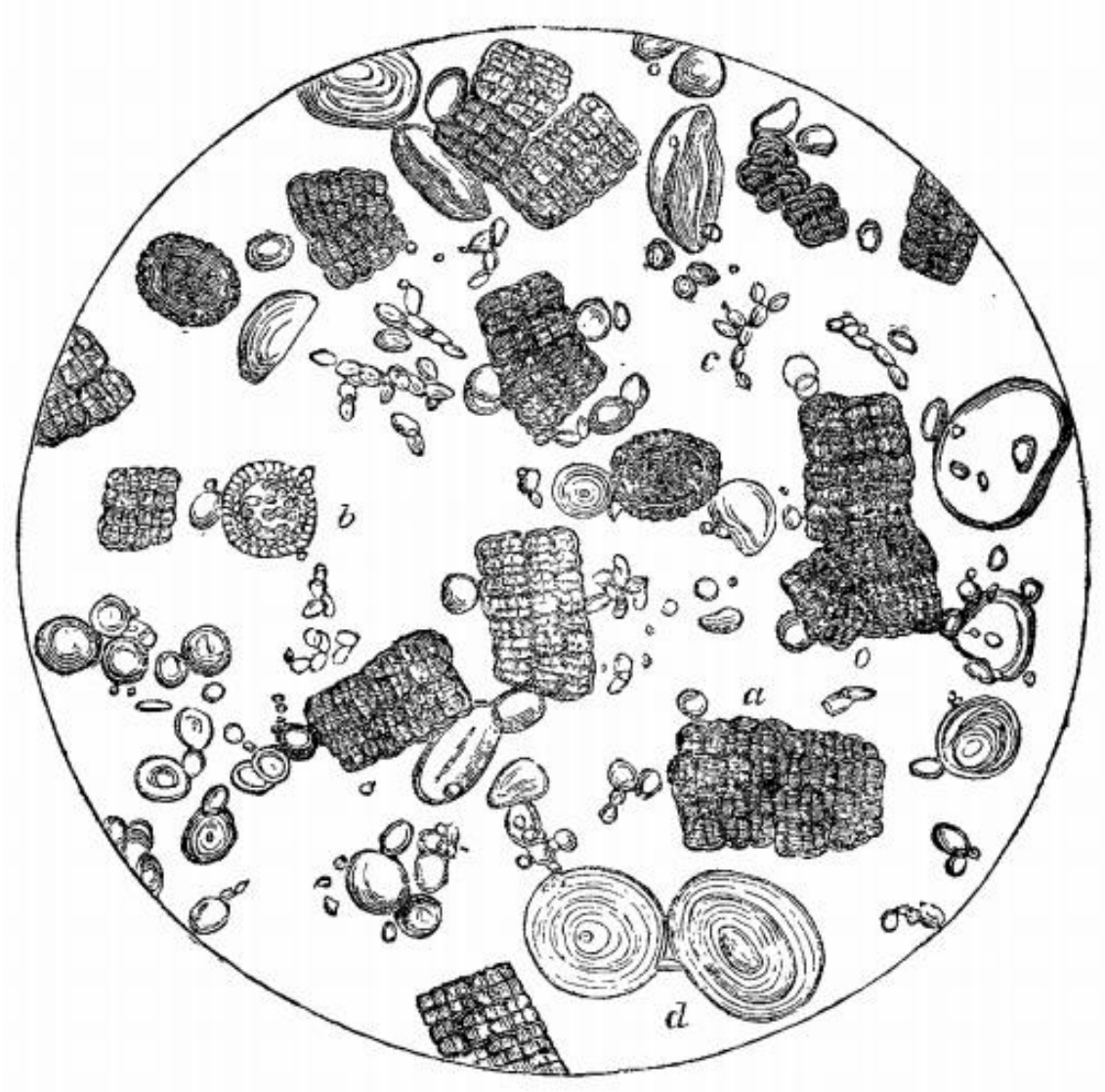

Figure 7. Hassall's image of *sarcina*

Source: Hassall A.H., 'On a Remarkable Case of Sarcina Ventriculi', *Lancet* (16th April 1853), p. 364.

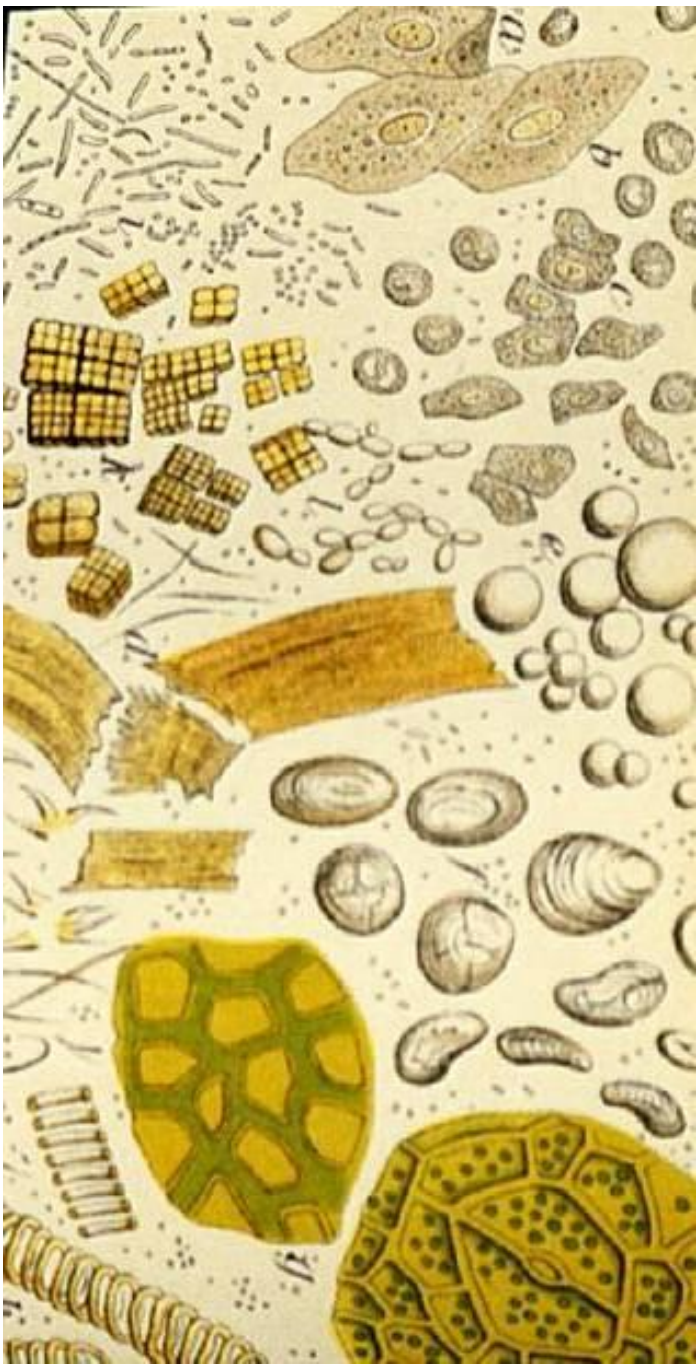

Figure 8. Jakob's image of *sarcina*

Source: Jakob C., *Atlas of Methods of Clinical Investigation, with an Epitome of Clinical Diagnosis and of Special Pathology and Treatment of Internal Diseases*, Eshner A.A. (trans.) (London: The Rebman Publishing Co., 1898), plate 11, unpaginated.

The wool pack formation of *sarcina*, as described by Goodsir, remained key to its recognition throughout the century. The images produced in diagnostic textbooks varied little from the original sketch published in 1842. In 1853 the microscopist Arthur Hill Hassall (1817-94), whose work at the time principally concerned food adulteration, commented that *sarcina* was 'well-known' and had 'usual characteristics' that were sought out in vomit samples.[60] These organisms became even more visible after the 1880s, when increasing use was made of staining reagents. *Sarcina* was rendered more distinguishable with iodopotassic-iodide solution, which turned it a 'deep mahogany-brown to reddish-brown' or a 'brownish yellow', depending on which textbooks are consulted.[61]

Practitioners learned to inspect vomit samples for *sarcina* specifically when presented with vomit of a characteristic quality that, once encountered, 'cannot afterwards be mistaken'.[62] An acidic, frothy, yeasty appearance and smell were the primary indication that *sarcina* might be found.[63] The vomit, when stood for between a few minutes to hours, would separate into two or three portions, brown yeasty foam would rise to the surface, containing bubbles which could 'often raise it considerably above the margin of the vessel in which it is placed.'[64] The quantity of vomit varied, though it was rarely less than a pint and often much more, and could take place up to two or three times daily.[65] It was in many cases brought on by eating vegetables, and led to a drawn, sunken appearance of the sufferer.[66] These clinical signs offered a verifiable link between vomiting and the presence of *sarcina* in illness.

[60] Hassall A.H., 'On a Remarkable Case of Sarcina Ventriculi', *Lancet* (16th April 1853), p. 363. For more on Hassall see Price J.H., 'Hassall, Arthur Hill (1817–1894)', *Oxford Dictionary of National Biography* (Oxford University Press, 2004) [http://www.oxforddnb.com/view/article/63790; accessed 22nd September 2011].
[61] Jaksch, *Clinical Diagnosis*, p. 108. See also Vierordt O., *A Clinical Text-Book of Medical Diagnosis for Physicians and Students*, Stuart F.H. (trans.) (Edinburgh and London: Young J. Pentland, 1891), p. 366; Bury, *Clinical Medicine*, p. 272; Musser J.H., *A Practical Treatise on Medical Diagnosis for Students and Physicians* (Edinburgh and London: Young J. Pentland, 1894), p. 495; Hutchinson R., *Clinical Methods: A Guide to the Practical Study of Medicine* (London, Paris and Melbourne: Cassell and Company, 1897), p. 83.
[62] Liddon, *Thesis on Vomiting*, p. 13.
[63] Hassall, 'On a Remarkable Case', p. 362.
[64] Liddon, *Thesis on Vomiting*, pp. 13-16. This foam consisted primarily of partially digested food and some flakes of *sarcina*.
[65] Liddon, *Thesis on Vomiting*, p. 17.
[66] See cases throughout Liddon, *Thesis on Vomiting*.

Sarcina's *Role in Diagnosis*

The 'sharing of pictorial resources was a tacit acknowledgement of their credibility as representations of reality', writes Stephen Jacyna.[67] As such, the replication of Goodsir's image of *sarcina* is not only evidence of its prominence in the literature, but supported its acceptance as being frequently present in vomited matters. Indeed, its identification in vomit became iconic of the value of microscopy in diagnosis and was written about in celebratory terms.[68] Hassall made these arguments clear in a case he had met with in London in 1853.[69] The doctor-turned patient, Dr. T., had been suffering from 'a very distressing dyspeptic affection' for fifteen years. Dr. T. was vomiting 'enormous quantities' of acidic, ropy fluid which was mixed with 'a tenacious straw-coloured mucus,' which damaged his throat as it rose. Upon microscopic analysis of the matters Hassall confirmed that, in the first drop he looked at, he detected '*sarcina ventriculi* in great abundance,' intermixed with starch corpuscles of wheat and some sporules of another kind.[70] Hassall declared that he was 'of course greatly pleased at the discovery of the *sarcina*, because herein I perceived clearly that I had obtained an important clue by which many of the most urgent and distressing symptoms of the case were to be explained.'

Hassall understood *sarcina* as an indicator of the state of acidity within the stomach, which he assumed was a necessary condition for their growth. As he believed the organisms themselves also encouraged fermentation, their presence explained why the condition was so severe, and why the patient had progressed to the point of emaciation. Hassall admitted that he chose to publish the case because he found that, once *sarcina* had been discovered in the vomit, he was able to treat their growth and slow down the rate of fermentation, encouraging his patient's recovery.[71] Without the microscopic discovery of *sarcina*, Hassall declared, his diagnosis and treatment would have been impossible.[72]

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[67] See Jacyna, 'The Establishment of Histology', pp. 241-3. Quote from p. 243.
[68] 'Critical Digest', p. 1038.
[69] Hassall, 'On a Remarkable Case', p. 365. Hassall had observed the conditions necessary for the production of *sarcina* in the 1840s. See Liddon, *Thesis on Vomiting*, p. 6.
[70] Hassall, 'On a Remarkable Case', p. 365.
[71] Treated with bicarbonate of potash, sulphite of soda, and monitored the patient's diet. Hassall, 'On a Remarkable Case', p. 365.
[72] Prior to his correspondence with Hassall, Dr. T. had also been treated by 'the late truly eminent and very amiable Dr. Prout'. Though no more information is given, it is safe to assume that he was referring to William Prout (1785-1850), a physician and advocate of physiological chemistry, who we might at least assume applied elementary chemical analysis to the vomited matters of Dr. T. before offering him a

Although microscopically-minded doctors had no issue accepting the existence of *sarcina* as microorganisms, its causal significance was more contentious.[73] Its role in vomiting was thought by the majority of practitioners, like Hassall, to be indirect. It was often initially believed that the organism promoted fermentation, which produced gas and possibly toxins. Recognition of this fermentation suggested to the practitioner that he was dealing with a case of dilatation (enlargement) of the stomach, with obstruction of the pylorus as a probable cause.[74] For this reason, in the 1850s a number of diagnostic manuals stated that the presence of *sarcina* was 'a valuable aid to diagnosis' as it gave demonstrable evidence of fermentation occurring within stomach.[75] By 1882 the pathologist John James Graham Brown (1853-1925) declared confidently that *sarcina*

> are met with in nearly all cases in which food remains too long in the stomach and there ferments, particularly in dilated stomach. Other micro-organisms may also be found, but are of less importance, so far as our present knowledge goes.[76]

3.4 *Sarcina* as Cause or Consequence?

Sarcina *as a Cause of Disease*

Goodsir's reference in 1842 to bacteria with fermentation has led one account of the history of bacteriology to declare that he was actually the first person to establish the causal connection of bacteria to disease, and consequently cure it. In 2003 Milton Wainwright, a microbiologist who writes as a contrarian historian, published 'An

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remedy. Microscopic analysis was thus also probably aided by chemical analysis in this case; Prout recommended a mixture of hydrochloric and nitric acids, though this did not prove successful. See Hassall, 'On a Remarkable Case', p. 339. For more on Prout see Holmes F.L., 'Elementary Analysis and the Origins of Physiological Chemistry', *Isis* (1963) **54:1**, pp. 50-81.

[73] Jacyna, 'The Establishment of Histology', pp. 242-3. For more on the material, literary and social technologies used in the establishment of microscopic facts as authoritative, see Jacyna L.S., 'Moral Fibre: The Negotiation of Microscopic Facts in Victorian Britain', *Journal of the History of Biology* (2003) **36:1**, pp. 39-85.

[74] Dilatation is enlargement and the pylorus is where the stomach connects to the intestines. For example, see Tanner T.H., *A Manual of Clinical Medicine and Physical Diagnosis*, 2nd edn (London: Henry Renshaw, 1869), p. 323; Guttman P., *A Handbook of Physical Diagnosis. Comprising the Throat, Thorax, and Abdomen*, Napier A. (trans.), from the 3rd German edn (London: The New Sydenham Society, 1877), p. 398; Foster, *A Short History of Clinical Pathology*, pp. 30-1. Malcolm described it as an 'accompaniment' to fermentation. See Malcolm, *An Introduction to Clinical Study*, p. 90.

[75] Barclay A.W., *A Manual of Medical Diagnosis: Being an Analysis of the Signs and Symptoms of Disease* (London: John Churchill, 1857), p. 450.

[76] Brown, *Medical Diagnosis*, p. 32.

Alternative View of the Early History of Microbiology'. He writes that '[r]emarkably, Goodsir claimed that his organisms caused diseases that could be cured by feeding his patients carbolic acid and sodium hyposulfite,' and that 'Victorian English pathologists possessed a clear appreciation of the role of Goodsir's *sarcina*, and other germs that are associated with disease,' by 1859.[77] Wainwright's Whiggishness is revealed by his anachronistic use of the term 'germs', which only took on its modern disease-causing meaning after 1860. In the mid nineteenth century, the causal connection between *sarcina* and illness was anything but clear-cut.

Although Hassall's therapy assumed that the presence of *sarcina* indicated high acidity and enhanced fermentation (hence the administration of antacids was the treatment of choice), this connection between fermentation and *sarcina* within the stomach was not universally agreed upon and was increasingly doubted. How was *sarcina*'s causal role in health and illness understood in the 1840s and 1850s? The belief that illness could arise from some internal decomposition, fungal organism or parasite (such as the 'cholera-fungus' blamed by some for the 1849 outbreak, or the parasitic worms visible in vomited matters) was not unheard of, and that morbidity could be encouraged by the multiplication of fungi was easily accepted.[78] Prominent views of how diseases were caused, based on miasmas and the zymotic analogy of German chemist Justus von Liebig (1803-73), maintained that the pathological process was one of internal decay, 'induced by material outside the body undergoing an identical form of decay'.[79] Furthermore, the term 'zymotic', which originated with the statistician and epidemiologist William Farr (1807-83), was from the Greek 'to ferment' and had replaced the general terms of endemic, epidemic and contagious.[80] According to

[77] To emphasise Goodsir's importance Wainwright uses a quote from Tilbury Fox (1859, no further reference given) that comments on the 'myriad of minute objects [that] are constantly floating about in the atmosphere', of their zymotic agency, and that similar bodies had been found in the blood and kidneys of typhus patients. See Wainwright M., 'An Alternative View of the Early History of Microbiology', *Advances in Applied Microbiology* (2003) **52**, pp. 333-55, quote p. 344. Wainwright works in the Department of Molecular Biology and Biotechnology at the University of Sheffield. A response to his article was published online at *Nature News* on 9th October 2003 [http://www.nature.com/news/2003/031009/full/news031006-9.html; accessed 19th June 2011], written by John Whitfield and entitled 'Pasteur knocked off pedestal?' In this response Corinne Jamma, a spokesperson for the Pasteur Institute in Paris defended conventional beliefs, claiming that Louis Pasteur (1822-95) 'was the first to provide scientific proof' about microbes in disease.

[78] For the history of ideas about the cholera-fungus see chapter five entitled 'The Cholera-Fungus Controversy of 1849', in Pelling, *Cholera*, pp. 146-203.

[79] Hamlin C., 'Providence and Putrefaction: Victorian Sanitarians and the Natural Theology of Health and Disease', *Victorian Studies* (1985) **28:3**, p. 382.

[80] Pelling, *Cholera*, p. 101. Fermentation was a common means of explaining 'multiplication' which characterised infectious diseases, but it also explained other bodily processes, including digestion. See

Margaret Pelling, Farr 'catered for specificity by proposing the existence in each case of a specific zyme, ferment, or "excitor", an organic poison affecting the blood but also showing a special affinity with certain organs or tissues.'[81] Non-specific decomposing organic matter was a predisposing cause, or part of a chain of causation, excited by an 'excitor'.[82] In this context, it was highly plausible that an organism like *sarcina* could, if it induced fermentation, be an exciting cause of disease.[83]

In a study of the use of neutral sulphites in diseases attended with parasitic plants (1851), William Jenner (1815-98), a physician and pathologist well-known for his scientific clinical teaching, examined the vomited matters of his patient James Martin.[84] The vomit was described as having '[f]loating on the surface [...] a layer, from a quarter to half an inch thick, of a brownish colour, closely resembling yeast in general characters, entangling in its substance quantities of air bubbles.'[85] The microscopical elements were found to consist of '[s]triated muscular fibres: sarcinæ ventriculi in great numbers, of a dark yellowish colour; torulæ very numerous, undistinguishable from the yeast-plant in size and shape; fat globules and starch.'[86] In his analysis, however, Jenner posed the question: 'did the primary disease in the case of Martin, consist in the presence of the *sarcina* in the stomach, or was the *sarcina* […] merely an epiphenomenon?'[87]

To answer this question Jenner drew on his experience of other cases occurring with *sarcina*, in particular a case of constriction of the pylorus and subsequent dilatation of the stomach, both of which conditions frequently resulted in retardation of food in the passage and the development of *sarcina*. The conclusion that Jenner ultimately drew was that *sarcina could* be the cause of the organic disease (in that they developed favourably in the secretion of specific fluids), and even if not, their presence would 'excite spasmodic closure' of the pylorus due to their nature as an irritant, causing the muscular fibres to be in constant action. Either way, Jenner argues that 'still must it be desirable to check their development and prevent their growth, as a means, if not of

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Pelling M., 'Contagion/Germ Theory/Specificity', in Bynum and Porter, *Companion Encyclopaedia*, p. 324.
[81] Pelling, 'Contagion/Germ Theory/Specificity', pp. 324-5.
[82] Pelling, 'Contagion/Germ Theory/Specificity', p. 325.
[83] Pelling, *Cholera*, p. 15.
[84] 'Critical Digest', p. 1035. On Jenner see 'Obituary: Sir William Jenner', *BMJ* (17th December 1898), pp. 1849-53.
[85] 'Critical Digest', p. 1038.
[86] 'Critical Digest', p. 1039.
[87] 'Critical Digest', p. 1040.

curing, at least of retarding, the progress of the organic disease.'[88] This theory was put into practice. In Hassall's case, although he had deliberated that the *sarcina* had a function in the patient's sickness, he decided to treat the sarcinous vomiting as a symptom (rather than the *sarcina* as a cause). When the illness was not cured he concluded that he had not 'discovered the first link in the 'morbid chain.'[89]

Sarcina *and Fermentation*

Most commonly then, *sarcina* was considered to be associated with disease, or to have a close relation to fermentation, rather than being its essential cause.[90] In a lecture delivered at St Mary's Hospital in 1857, Thomas King Chambers warned that

> the *sarcinæ* is unfortunately no means idle in the stomach. A great number, perhaps all, of these cryptogamous plants, whose nature is to grow upon decomposing organic matter, have the property of promoting decomposition, so that they are not only the consequences, but the causes also, of decay.[91]

The relationship of *sarcina* to fermentation was of much interest to pathologists, and was a point of contention. Rudolf Virchow (1821-1902) wrote as early as 1847 that 'the *sarcina* has no relation whatever to the fermentation or to any pathological process.'[92] Although most practitioners did not dismiss the connection as readily as Virchow, the 1854 MD dissertation of an Edinburgh graduate, Edward Liddon, demonstrates the complexity of this issue.[93] Writing 'On vomiting of sarcinæ and torulæ', Liddon's interest lay primarily in knowledge of the environment in which *sarcina* thrived, and consequently how this type of vomiting might be treated. Liddon described his own experiments, which involved treating *sarcina* with iodine, testing decomposition rates by heating in a test tube, and chemical experiments similar to those that are discussed in

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[88] 'Critical Digest', p. 1041.
[89] Hassall, 'On a Remarkable Case', p. 365. Sarcinous vomiting was the label attached to the condition following its most common occurrence in cases of chronic disease of the stomach. See Ferrier D., 'The Constant Occurrence of Sarcina Ventriculi (Goodsir) in the Blood of Man and the Lower Animals: with Remarks on the Nature of Sarcinous Vomiting', *BMJ* (27th January 1872), p. 98.
[90] More, 'On the Sarcina Ventriculi', p. 7.
[91] Chambers T.K., 'Practical Lectures on the Management of the Digestion in Disease', *Lancet* (8th August 1857), p. 132.
[92] Virchow R., *Virchow' Archiv.,* (1847) **i**, p. 264 cited in Smit J., 'The Biology of the Fermenting Sarcinæ', *Journal of Pathology and Bacteriology* (1933) **36:3**, p. 455.
[93] The thesis was considered worthy of a prize. See 'News and Topics of the Day', *Association Medical Journal* (1st September 1854), p. 798.

the final section of this chapter.[94] When questioning its pathological character Liddon referenced George Budd, who maintained that since *sarcina* had been found in decomposing and acidic animal secretions, specifically urine and bile, they must be a product of fermentation or decomposition.[95] Liddon disagreed, noting that *sarcina* had also been found in alkaline solutions, and thus their growth could not depend solely on an acidic state.[96] This conclusion challenged the routine conception that vomiting with *sarcina* confirmed a diagnosis of fermentation within the digestive system.

Prior to Liddon's thesis, attempts had been made to artificially reproduce *sarcina*, both by Budd and Robert Bentley Todd (1809-60), a clinical lecturer, leading London practitioner and internationally known researcher.[97] Using a tin stomach Todd combined a portion of food, hydrochloric acid and a sample of vomit containing *sarcina*. This artificial stomach was then kept at a 'natural' temperature for almost three weeks. Though the food was digested, on no occasion was *sarcina* found in it. Liddon put this down to a lack of involvement of a living state, judging that some 'vital influence' was necessary.[98] Budd also performed an experiment achieving similar results, and subsequently deemed that a particular kind of fermentation of the stomach contents was needed for their development, and that the occurrence of *sarcina* assisted in the formation of acetic acid only after the matters had been thrown out of the body.[99] In addition to these experiments, Liddon's own experimental stomach (which he kept at the correct temperature by leaving it in a bathroom), confirmed to him that *sarcina* (as many other animal and vegetable parasites) was predominantly found in connection with fermentation, acidity and 'communication with some living animal'.[100] However, since *sarcina* were also found to exist in solids of the body, Liddon concluded that 'fermentation [was] not necessary for their development'.[101]

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[94] Liddon, *Thesis on Vomiting*, p. 12.
[95] Liddon, *Thesis on Vomiting*, p. 49.
[96] Liddon, *Thesis on Vomiting*, p. 50.
[97] Helmstadter C., 'Todd, Robert Bentley (1809–1860)', *Oxford Dictionary of National Biography* (Oxford University Press, 2004) [http://www.oxforddnb.com/view/article/27492; accessed 13th June 2011].
[98] Liddon, *Thesis on Vomiting*, p. 51.
[99] Budd G., 'On Fermentation of the Contents of the Stomach, with the Development of Sarcinæ', *Retrospect of Medicine* (1854) **29**, pp. 141-5. The disease was not constituted by fermentation, however, but by some other organic change which prevented the stomach from emptying itself completely. See p. 143.
[100] Liddon, *Thesis on Vomiting*, p. 53.
[101] Liddon, *Thesis on Vomiting*, p. 55.

Liddon's alternative was that the conditions in which *sarcina* might be found could be narrowed down to three main types: functional disease of the stomach, mechanical injury of the stomach and organic disease of the stomach.[102] As a result of his investigations, and the variety of conditions in which *sarcina* were discovered, he concluded that they must be a consequence of, or concurrent with, pre-existing diseases, and not their trigger.[103] The *sarcina* could be treated, or 'killed' therefore, by combating the variety of conditions that might encourage their growth – acidity and lack of flowing of the bowels. As such, Liddon recommended a dietetic regimen, tonics and sedatives, and counter-irritation of the stomach, using stimulating liniments, ointments or blisters.[104] Despite disagreeing on the nature of *sarcina*, Budd's own lecture expressed a similar conclusion:

> although the development of torulæ and sarcinæ cannot be considered the primary cause of the stomach disorder, the fermentation that attends it, by leading to the evolution of gas, and the formation of acetic acid, and thus distending and fretting the stomach, terribly aggravates the sufferings which the impediment to the emptying of the stomach, which is the origin of the mischief, would otherwise produce.[105]

Such doubts increased in the latter decades of the nineteenth century. The Leeds-based surgeon Thomas Nunneley (1809-70) was a vocal critic of Louis Pasteur's (1822-95) and Joseph Lister's (1827-1912) ideas on germs and disease in the 1860s, claiming that germs did not exist in the number and extent alleged.[106] Rather, Nunneley asserted, 'some minute organisms, vegetable as well as animal, may be wafted in the air, and float about, as microscopic particles or organic and inorganic matter do,' but when formed in decaying matter, they are more frequently a result of putrefaction rather than its cause. One of Nunneley's examples was *sarcina* found in fermenting conditions of the pylorus. Therefore, amongst many doctors, *sarcina* was understood to be a by-product of disease, meaning that identifying these organisms in vomiting was not necessarily helpful in diagnosis.

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[102] He also found one case in which *sarcina* was considered the primary affection by default, in which a man was brought in dead to the hospital and *sarcina* was the only significant finding from the post mortem. See Liddon, *Thesis on Vomiting*, pp. 60-1.
[103] Liddon, *Thesis on Vomiting*, p. 63.
[104] Liddon, *Thesis on Vomiting*, pp. 90-5.
[105] Budd, 'On Fermentation', p. 144.
[106] Nunneley T., 'Address in Surgery', *BMJ* (7th August 1869), p. 154.

The theory that *sarcina* was generated by, or merely concomitant to, fermentation, rather than being its cause, was put to the test during the 1870s. A number of articles, including reports on experiments conducted to ascertain whether the minute bodies might survive outside of the conditions in which they were originally identified, were published in the *BMJ*.[107] In 1872 David Ferrier, whilst demonstrator of practical physiology at King's College, declared that the occurrence of *sarcina* outside of (what was thought) their 'natural habitat' was looked 'upon as a curious pathological fact.'[108] In his experience, 'sarcinæ neither generate acids in organic fluids, nor is their growth accompanied by the evolution of gases,' and therefore the *sarcina* were 'merely in accidental, and not in causal relation,' when ejected in vomiting.[109] Ferrier concluded, however, that 'Sarcinæ still remain as mysterious as ever. What is their true nature? Are they parasites, or are they a normal constituent of the blood?'

The Pathological Nature of Sarcina

One important consequence of the debate on the relationship between *sarcina* and fermentation was that the very nature of the organism as pathological was further investigated. A week after Ferrier posed his questions regarding the nature of *sarcina*, Charlton Bastian responded. Bastian (1837-1915) was professor of pathological anatomy in University College and physician to the hospital, and had also published in 1872 the first volume of his work on *The Beginnings of Life*. Bastian was a supporter of the (*heterogenesis*) spontaneous generation theory, which posited that 'living organisms [formed] from dead or devitalised organic matter', and a leading opponent of bacterial germ theories.[110] Bastian found that Ferrier's experiments strengthened his opinion of *sarcina* – that it was not a living thing and would therefore not have been considered a causal factor in disease.[111] In addition to Ferrier's evidence, Bastian wanted to confirm other findings which had identified *sarcina* in stagnant water, 'on the surface of old bones,' and even on hay-infusions.[112] For *sarcina* to be associated with a disease it

[107] For example, see 'Sarcina in Blood', *BMJ* (27th January 1872), p. 106 and Leared A., 'Sarcina Ventriculi', *BMJ* (10th February 1872), p. 169.
[108] Ferrier, 'The Constant Occurrence', p. 98.
[109] Ferrier, 'The Constant Occurrence', p. 99.
[110] Worboys M., *Spreading Germs: Disease Theories and Medical Practice in Britain, 1865-1900* (Cambridge: Cambridge University Press, 2000), pp. 87-8. *Heterogenesis* was Bastian's term for *biogenesis*. Bastian denied disease specificity and cause.
[111] Bastian wrote of his doubts that *sarcina* was a living organism in Bastian H.C., *The Beginnings of Life: Being Some Account of the Nature, Modes and Origin and Transformation of Lower Organisms*, vol. 1 (London: Macmillan and Co., 1872), p. 286.
[112] Bastian H.C., 'On the Nature of the So-Called Sarcina Ventriculi', *BMJ* (3rd February 1872), p. 123.

needed to be a living entity, such as a 'fungus-germ', but causes, or agents, of zymosis and sepsis were considered to be chemicals.[113] Instead, Bastian argued that 'there is not sufficient evidence to show that it is really a living organism,' as 'all real Fungus-germs' grew and multiplied.[114] Rather, *sarcina* was constituted by a combination of the organic and the mineral.

The fact that *sarcina* was found in stomachs of healthy persons was evidence enough for some practitioners that it was not a causative factor and itself was not the reason for vomiting.[115] An 1881 lecture by the leading German-Swiss pathologist Edwin Klebs (1834-1913), concluded with a note of finality that 'the sarcina of Goodsir, may indeed pass through the organism, without, however, producing in its passage either direct or indirect disturbances.'[116] By this time, common medical teaching dictated that *sarcina* was a result or concomitant of disease.[117] It was continuously paired or classified with the various conceptualisations of germ theories of disease of the 1860s and 1870s, which included 'chemical poisons, ferments, degraded cells, fungi, "bacteria" or a class of parasites,' despite never being considered truly as a specific cause.[118]

The history of Goodsir's *sarcina* in bacteriological thought and practice is more complex than Wainwright suggests. Even Goodsir himself expressed doubts as to the role *sarcina* played in disease. In 1863 he suggested to Darwin of *sarcina* that 'if not the cause or source of your distress, they may, assuming them to be present, very much increase your discomfort'.[119] Although many scientists recognised such microorganisms as the product of the transformation of damaged body cells, s*arcina* was soon increasingly verified by pathologists and practitioners as being found in the stomachs of

[113] Worboys, *Spreading Germs*, p. 89.
[114] Bastian, 'On the Nature', p. 123.
[115] Barnard F.A.P., 'The Germ Theory of Disease and its Relation to Hygiene', *Public Health Papers and Reports* (1873) **1**, p. 80.
[116] Klebs E., 'An Address on the Relations of Minute Organisms to Certain Specific Diseases', *BMJ* (13th August 1881), p. 280.
[117] See More, 'On the Sarcina Ventriculi', p. 7.
[118] Worboys, *Spreading Germs*, p. 2.
[119] *Darwin Correspondence* (letter no. 4272). Despite the attention of both Goodsir and Busk, Darwin's illness worsened throughout the summer and early autumn, although he began recovering slowly in late September of that year. See *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry-4310 (letter no. 4310; accessed 9th June 2011).

healthy men, in faeces, in urine, in the blood, in the brain and even in the abscess of a lung; further dissociating it from any specific condition of the stomach.[120]

Sarcina was, however, commonly considered to play a secondary role in disease. As such it continued to be the prime focus of microscopical vomit analysis in clinical practice. It was established by clinical diagnosticians as a valuable marker because, when present, it was visible evidence that the vomiting was probably morbid and the result of a dysfunctional digestive system. The term 'sarcinous vomiting' was used on several occasions and confirms the identification of *sarcina*'s minimal use in diagnosis as merely signifying pathological vomiting.[121]

3.5 Acid, Digestion and Chemical Analysis

Wilson's Analysis and Interest in Digestion

A significant proportion of Goodsir's 1842 case report was devoted to a description of the chemical analysis of the patient's vomited matters by George Wilson. Most attention was given to the vomit's acidity, using various solutions and filtering methods, and to analysing the precipitate. 'It reddened litmus powerfully,' Wilson wrote, and in addition it 'effervesced sharply with alkaline carbonates'.[122] He specifically tried to identify the type of acid and concluded that it was primarily acetic, with the addition of a small amount of hydrochloric acid and hydrated lactic acid. His analysis relied to a degree on smell, which acted as a form of differential diagnosis by ruling out other chemicals, and on taste, which he refers to as 'saline'.[123] Wilson also sought to determine the atomic weight of the acid, but found this impractical.[124] He was unable to determine whether the acids were normally present in the stomach, or whether they were constituents of a pathological condition; he wrote that 'the statements on record concerning the normal acids of the stomach are very incomplete and unsatisfactory.'[125] Wilson was unable to

[120] Reiser, *Medicine*, p. 93. Virchow found it in the lung. Bennett, *An Introduction to Clinical Medicine*, p. 126. It was reported to have been found in the brain: Tanner, *A Manual of Clinical Medicine*, p. 323; 'Sarcina in Blood', p. 106; Ferrier, 'The Constant Occurrence', p. 98.
[121] Ferrier, 'The Constant Occurrence', pp. 98-9.
[122] Goodsir, 'History of a Case', p. 437.
[123] Goodsir, 'History of a Case', pp. 438-41.
[124] Goodsir, 'History of a Case', p. 442.
[125] Goodsir, 'History of a Case', p. 442. Wilson believed that he was the first to find both lactic and acetic acid simultaneously in stomach contents. The analysis was described as elaborate in Budd, 'On Fermentation', p. 141.

suggest any significance to his findings, or whether the acidity had any direct connection to the 'curious organism' which Goodsir had discovered.

This case is representative of the lack of diagnostic significance that chemical analysis had to offer in clinical cases at this time. Frederic Holmes writes that '[t]he inadequacy of conceptions about chemical change may have been largely responsible for the tendency in this period to regard the process of analysis as merely the separation of constituents previously present in the original substances.'[126] It had only been in the early nineteenth century that physiological experimenters had demonstrated that digestion was a process founded on acids at all, as opposed to putrefaction or the mechanical grinding associated with peristalsis.[127] The chemical make-up and role of gastric fluid in digestion was, however, of increasingly prominent interest to physiologists.[128]

Vomited matters had themselves been used as the subjects of experiments into the nature of gastric secretions and their role in digestive processes. Lazzaro Spallanzani (1729-99), an Italian priest and naturalist, had used samples of his own vomit in his investigations, and it was on the basis of these that gastric acid was first proposed to be hydrochloric.[129] This fact was later confirmed by William Prout (1785-1850), a chemical experimentalist who identified free hydrochloric acid in animals and humans, and '[f]or the first time ever quantitative measurements were made of both free and total hydrochloric acid'.[130] The use of stomach tubes and test meals to retrieve standard stomach contents for chemical analysis were further indications of the interest and investigations into the processes that occurred in the stomach during digestion.[131] The extent to which the chemical testing of vomited matters could offer diagnostic benefit therefore depended on what was expected to be found in the normal stomach.[132]

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[126] Holmes, 'Elementary Analysis', p. 54.
[127] See Holmes F.L., 'The Physical Sciences in the Life Sciences', in Nye M.J. (ed.), *The Modern Physical and Mathematical Sciences* (Cambridge: Cambridge University Press, 2003), pp. 224-8.
[128] Combe describes a method using a dry sponge secured within a hollow, perforated ball attached to a string, which is swallowed and then withdrawn. See Combe A., *The Physiology of Digestion considered with Relation to the Principles of Dietetics*, 2nd edn (Edinburgh: Maclachlan and Steward, 1836), p. 95.
[129] Baron J.H., 'Gastric Acid is Hydrochloric', in Bynum W.F. (ed.), *Gastroenterology in Britain: Historical Essays* (London: Wellcome Institute for the History of Medicine, 1997), p. 45.
[130] Baron, 'Gastric Acid is Hydrochloric', p. 46.
[131] See Ewald C.A., *Lectures on Disease of the Digestive Organs* (London: The New Sydenham Society, 1892), p. 233 and Gillespie A.L., *A Manual of Modern Gastric Methods: Chemical, Physical and Therapeutical* (Edinburgh: Oliver and Boyd, 1899), pp. 11-12.
[132] Holmes, 'The Physical Sciences', p. 228.

Chemical Analysis and the Hospital Laboratory

From the mid nineteenth century hospital laboratories were increasingly utilised for diagnostic purposes, with tests largely performed by clinicians.[133] By the 1890s it had become possible to identify quite readily the microorganisms causing such diseases as tuberculosis, cholera, typhoid and diphtheria, and although historians have focused on the emergence of these bacteriological diagnoses, chemical analyses were as common and important.[134] Hospital annual reports show that vomited matters were routinely subjected to chemical analysis, but while textbooks recommended all material be assessed, there were neither the facilities nor inclination to do so.[135] The systematic examination of morbid bodily solids and fluids did not occur in a clinical laboratory in St Thomas's Hospital, for instance, until 1898. Writing of the laboratory's inception, the hospital's superintendent and demonstrator of morbid histology, Louis Leopold Jenner (d.1904), announced that the work expected to be undertaken included:

> cutting all tumours, […] examining all cultures from suspected cases of diphtheria, and examining sputum and urine for tubercle bacilli in those cases where a search in the wards has been unsuccessful; the estimation of hæmoglobin and enumeration of blood-corpuscles, serum reactions for typhoid, together with the examination of such urines, vomits, &c., as present any unusual features.[136]

The records of St Bartholomew's clinical laboratory offer a similar picture; it was only 'in the more obscure medical cases that such assistance [was] of special value'.[137] Blood, sputum, pus and urine were the bodily fluids most consistently dealt with in the laboratories, as well as materials from tumours and ulcers. St Bartholomew's pathologists considered vomit to be amongst the 'miscellanea' that they had to deal with.[138] This is unsurprising. If every patient in the hospital suffering from this symptom had their vomit analysed one would expect, due to the prominence of

[133] Worboys, *Spreading Germs*, p. 213.
[134] Worboys, *Spreading Germs*, p. 213 and Cunningham A., 'Transforming Plague: The Laboratory and the Identity of Infectious Disease', in Cunningham A. and Williams P. (eds), *The Laboratory Revolution in Medicine* (Cambridge: Cambridge University Press, 1992), pp. 209-44.
[135] Liddon, *Thesis on Vomiting*, p. 32.
[136] Jenner L., 'The Clinical Laboratory', *Saint Thomas's Hospital Reports* (1898) **26**, p. 194.
[137] Andrewes F.W., 'The Growth and Work of the Pathological Department of St. Bartholomew's Hospital', *Saint Bartholomew's Hospital Reports* (1899) **34**, p. 199. For more on St Bartholomew's see Waddington K., *Medical Education at St Bartholomew's Hospital 1123-1995* (Woodbridge: The Boydell Press, 2003).
[138] Andrewes, 'The Growth and Work', p. 203.

vomiting, that this would consume much of the laboratory's time whilst offering little diagnostic or therapeutic benefit.

At the end of the nineteenth century microscopic and chemical analyses were still seen as supplementary to naked-eye, macroscopic analyses. Nonetheless, the laboratory identification of free hydrochloric acid was significant. In its first year the clinical laboratory at St Thomas's analysed twenty-three vomit or test meal samples, 'in the majority of cases for free HCI', and by 1903 they were explicitly looking for 'hydrochloric acid, lactic acid, etc,' in the forty-three samples analysed.[139] Vomited matters still comprised only a small percentage of the analyses conducted that year. In comparison, serum reactions for typhoid fever were tested on 190 occasions, blood was examined 197 times, throat cultures 179 times, sputum 67 times, urine 51 times and bacteriological examinations were conducted 100 times.

The reported findings on vomit at St Thomas's clinical laboratory in 1902 were as follows: 'Free hydrochloric acid was found to be present on 13 occasions, absent on 26; while lactic acid was present 4 times'.[140] What would have been the significance of these findings for diagnosis? By the early twentieth century, clinicians and pathologists understood that free hydrochloric acid, essential for digestion, was absent in the majority of cases of cancer of the stomach, and taken in conjunction with other symptoms served as a useful diagnostic indicator for distinguishing a life threatening disease from commonplace symptoms.[141] When this had first been noted in 1879 by the German physician Reinhard van der Velden (1851-1903), it had sparked much interest and experimental work.[142] He used the stain methyl-violet in a variety of cases of dilatation of the stomach, finding that free hydrochloric acid was absent in cases caused by cancer of the pylorus. This test had potential for diagnosis of stomach cancer, which commonly presented with nausea and vomiting. Though objections were raised on the basis of the stain used – that it was not sensitive enough to indicate free hydrochloric acid – experimental findings of other investigators largely confirmed van der Velden's

[139] Jenner L., 'Report on the Clinical Laboratory for 1898', *Saint Thomas's Hospital Reports* (1899) **27**, p. 309; Dudgeon L.S., 'Report for 1903 of the Clinical Laboratory, St. Thomas's Hospital', *Saint Thomas's Hospital Reports* (1904) **32**, p. 378.
[140] Dudgeon L.S., 'Report for 1902 of the Clinical Laboratory, St. Thomas's Hospital', *Saint Thomas's Hospital Reports* (1904) **31**, p. 344.
[141] Moore B., 'On the Absence or Marked Diminution of Free Hydrochloric Acid in the Gastric Contents, in Malignant Disease of Organs other than the Stomach', *Proceedings of the Royal Society of London* (4th May 1905), p. 138; Douglas C.C., *Chemical and Microscopical Aids to Clinical Diagnosis* (Glasgow: James Maclehouse and Sons, 1899), p. 149; Gillespie, *A Manual of Modern Gastric Methods*, p. 32.
[142] Moore, 'On the Absence', p. 138.

findings.[143] The absence of free hydrochloric acid was also noted in some cases of acute infectious disease, anaemia, neurasthenia, hysteria, tabes, Addison's disease, atrophy of the gastric mucous membrane and chronic gastritis.[144] This was explained as disruption of the action of secreting cells due to local irritation or atrophy of cells, though the absence of hydrochloric acid in cases of cancer was often identified before such disruption was marked.[145] The presence of lactic acid was also considered pathological in some cases; it was normally found in the stomach, but was pathological if present several hours after food and was particularly found in dilatation when fermentation of the stomach contents was occurring.[146] Often in these cases, volatile organic acids were also found; their occurrence was common when stagnation was taking place, and they were believed to be abnormal elements of gastric fluids.[147]

Poisoning

Such chemical findings offered minimal diagnostic specificity in most patients with severe or persistent vomiting, but they were crucial in cases of chemical poisoning, where tests were used to identify the offending substance.[148] Toxicological testing served an important role in legal proceedings; it was based on extracting and reproducing the poison, offering demonstrable evidence that the poison was material and tangible. This also played a significant social role by defusing the primary fear associated with poisoning – that it left no trace.[149]

The leading figure in toxicology was Alfred Swaine Taylor (1806-80). Taylor was a lecturer on medical jurisprudence and chemistry in Guy's Hospital and was the author of *Poisons in Relation to Medical Jurisprudence and Medicine,* which became the standard text in toxicology, offering a significant contribution to the formalisation of medical jurisprudence as a profession. In the 1848 first edition of this work, Taylor wrote that '[o]ne of the best proofs of poisoning, in the living subject, is the detection of

[143] Moore, 'On the Absence', pp. 138-9.
[144] Moore, 'On the Absence', p. 141.
[145] Moore wrote that it was partly his aim to determine more precisely why free hydrochloric acid was largely absent in cancer cases. Moore, 'On the Absence', pp. 142-3.
[146] Douglas, *Chemical and Microscopical Aids*, p. 155.
[147] Douglas, *Chemical and Microscopical Aids*, p. 158.
[148] See O'Shaughnessy W.B., 'On the Recent Discovery of Copper in Organic Matters, Considered with Respect to Cases of Poisoning, or the Adulteration of Food', *Lancet* (19th March 1831), p. 806; Stevenson, 'Poisoning by Aconitine', pp. 314-15.
[149] See Burney I., *Poison, Detection, and the Victorian Imagination* (Manchester: Manchester University Press, 2006), p. 80.

poison by chemical analysis, either in the food taken by the person labouring under its effects, or in the matters vomited.'[150]

Nonetheless, the identification of poisons within vomited matters was by no means conclusive. This evidence would not have necessarily been sustained in a court of law as, although vomited matters could reveal some truths about what had been consumed, they could just as easily be manipulated. Taylor points out that poisoning was at times both feigned and imputed: 'It is very easy for an artful person to put poison into food, and to accuse another of having administered it, as well as to introduce poison into the matters vomited or discharged from the bowels.'[151] For toxicological purposes the matters first ejected would preferably be obtained, though circumstances often dictated less than ideal means of attaining this evidence:

> If none be procurable, and the vomiting have taken place on the dress, furniture, or floor of the room, - then a portion of the clothing, sheet, or carpet, may be cut out and reserved for analysis:- if the vomiting have occurred on a deal floor, a portion of the wood may be scraped or cut out:- or if on a stone pavement, then a clean piece of rag or sponge soaked in distilled water, may be used to remove any traces of the substance.[152]

Evidence of these methods in practise is offered by a case of arsenic poisoning in which the wife of the victim was said to have thrown the vomited matters out of a window. The medical witnesses collected the earth below and scraped the floor of the chamber until sufficient evidence had been retrieved.[153]

The identification of poisons within vomited matter was often only considered by the legal profession as decisive proof when they had been vomited directly 'into a *clean vessel* in the presence of the medical attendant himself, or of some person on whose testimony perfect reliance can be placed.'[154] Taylor recalls a case being thrown out of court because the jar used to store the vomit had been borrowed from a grocer. In situations where a stomach-pump had been used to retrieve the stomach contents for

[150] Taylor A.S., *On Poisons in Relation to Medical Jurisprudence and Medicine* (Philadelphia: Lea & Blanchard, 1848), p. 53. In fatal cases matters would be extracted from the body for testing.
[151] Taylor, *On Poisons*, p. 53.
[152] Taylor, *On Poisons*, p. 89.
[153] Taylor, *On Poisons*, p. 301.
[154] Taylor, *On Poisons*, p. 53 and p. 92.

analysis, including perhaps the glass reservoir previously mentioned, it was vital that these instruments were kept clean so that the results could be used as evidence.[155]

Once isolated the vomited matters were assessed, with their odour, colour, quantity and acidity/alkalinity determined.[156] Heavy mineral poisons were thought to fall to the bottom or adhere to the sides of the vessel they were contained within.[157] In fact, the testing did not need to be complex to establish an initial suspicion of poisoning; with acidic poisons the vomited matters would be expected to damage the surface onto which they fell, such as discolouration of items of clothing.[158] Odour was particularly significant; phosphorous, for instance, was thought to smell of garlic. Predominantly, however, poisons were distinguished between by interpretation of subtle differences in colour, although not all were as notable as the vomit tainted with phosphorous which would glow in the dark.[159]

Beyond this initial response, vomited matters could be subjected to more intense manipulative investigation in suspected poisonings. The types of poison which Taylor mentioned detecting in mid nineteenth-century cases included sulphuric acid, sulphate of indigo, potash and soda, phosphorus, chlorine, and iodine. Arsenic was a particular favourite amongst would-be criminals; it was 'the poison most frequently chosen for the purpose of committing murder,' due to 'its ready availability and ease of secret administration'.[160] Numerous tests had been developed for the detection of arsenic, ranging from those based on taste and smell, to the 'reduction test', which returned the acid to its metallic state.[161] The unreliability of these tests, however, meant that a more common practice was that of obtaining signs of the presence of arsenic, and other toxins, through the use of reagents. Although the Marsh test – announced by its developer, the London chemist James Marsh (1794-1846), in 1836 – was found to be a more precise qualitative test for arsenic, the appearance of the unadulterated vomited

[155] Jackson, *The Invention of the Stomach Pump*, p. 236.
[156] Taylor, *On Poisons*, p. 89.
[157] Taylor, *On Poisons*, pp. 89-90.
[158] Taylor, *On Poisons*, p. 160.
[159] Taylor, *On Poisons*, p. 243. See Burney, *Poison*, pp. 89-90 for more on the observation of minute differences between colours in identifying toxins.
[160] First quote from Christison R., *A Treatise on Poisons* (Edinburgh: Adam Black, 1829), p. 172, cited in Burney, *Poison*, p. 86. Second quote from Burney, *Poison*, p. 86.
[161] The reliability of the taste and smell test was called into question in the late 1820s when it was suggested that the taste of arsenic was perceived differently by different people. The 'reduction test' involved heating matter extracted from the body. For the tests use to detect arsenic see Burney, *Poison*, pp. 87-8.

matters, in addition to their colour following the use of reagents, remained the principal indications for analysis.[162]

Food poisoning stands in contrast to the prevalence of chemical poisoning in both the public and medical sphere's view. The term 'food poisoning' for an illness caused by eating 'bad' food, normally indicated by vomiting and diarrhoea, was being employed in the mid nineteenth century, though not as a term denoting a specific illness.[163] For instance in 1856 a report under the heading 'Food Poisoning' told of 'some poor persons in a court in the Old Bailey who had been taken suddenly ill [who] had all partaken of cheese bought at the same shop'.[164] They all suffered 'violent retching', but responded to emetic doses of sulphate of zinc'. At this time illness as a result of food intake was thought either due to adulteration or decomposition of food owing to the presence of chemical poisons and later ptomaine. Although possibly the largest cause of vomiting, food poisoning, in the modern sense of the term, received little medical interest as any illness was temporary and doctors were rarely consulted.[165]

During the 1870s, 1880s and 1890s the reports of St Thomas's and St Bartholomew's Hospitals demonstrate that sickness was not named by a generic term, but after the individual item of food responsible. Cases recorded included those caused by stale fish, pea soup, pickled pork and several cases of ice cream poisoning. Ptomaine poisoning was first noted as a classification for patients in these reports in 1893 and continued to be used alongside individually named food items well into the 1910s.[166]

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[162] For more on the Marsh test see Burney, *Poisons*, pp. 97-109.
[163] Taylor, *On Poisons*, pp. 444-53.
[164] Veritas, 'Food Poisoning', *Lancet* (9th February 1856), p. 169.
[165] Hardy A., 'Food, Hygiene, and the Laboratory. A Short History of Food Poisoning in Britain, circa 1850-1950', *SHM* (1999) **12:2**, pp. 294-5. 'Irritant poisoning' of mineral, vegetable and animal origins were accepted causes of vomiting during the mid nineteenth century – see Taylor, *On Poisons*, p. 40. The first pieces of legislation on this issue were published in the 1860 and 1872 Adulteration of Food Acts, and the 1875 Sale of Food and Drugs Act, which aimed to tackle food retailer's practices, rather than in response to knowledge of a specific biological cause of food poisoning. Food poisoning should also be distinguished from meat-transmitted diseases, which were a concern. See for example Waddington K., *The Bovine Scourge: Meat, Tuberculosis and Public Health, 1850-1914* (Woodbridge: Boydell Press, 2006).
[166] (Pea-soup) Cranstoun Charles T., 'Medical Report. 1878', *Saint Thomas's Hospital Reports* (1878) **9**, p. 278; (Ice cream) Hadden W.B., 'Medical Report. 1886', *Saint Thomas's Hospital Reports* (1886) **16**, p. 292; (Ice cream) Calvert J. and Garrod A.E., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1898', *Saint Bartholomew's Hospital Reports* (1899) **35**, p. 30; (Ptomaine) Ormerod J.A. and Berry J., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1893', *Saint Bartholomew's Hospital Reports* (1894) **30**, p. 29; (Food) Mavrogordato A., 'Medical Report. 1905', *Saint Thomas's Hospital Reports* (1906) **34**, p. 58. See Saint Thomas's Hospital Reports and Saint Bartholomew's Hospital Reports of the 1870s-1920s for many more instances.

It had been in 1880 however, as Anne Hardy writes, at a machinery sale held in Welbeck Abbey which caused seventy-two reported cases of sickness and four deaths, that public health authorities became aware of a possible 'illness-inducing organism' that acted when ingested. Hardy writes that 'this was the first time anyone in England had thought to associate a living organism with the much more ordinary affliction of vomiting and diarrhoea'.[167] Public health concerns with food safety and poisoning emerged in the 1880s, then, as a result of suspected bacterial, rather than chemical, causes of stomach upsets. The term 'food poisoning' for a specific condition was routinely used amongst doctors from the 1890s.

In the last decade of the nineteenth century vomited matters, alongside samples of food, were tested for bacteria in suspected poisoning cases, though this practice was not clearly or consistently presented in medical texts on diagnosis.[168] Microbe-studies at this time were accommodated within pathology and public health, and were not usually a part of the clinician's remit.[169] It was not until the final years of the nineteenth century that different food poisoning bacteria could be identified, and that serological examinations were used in diagnoses, and even then there were numerous different organisms involved of unknown nature and habitat.[170] Food poisoning, therefore, did not feature significantly as a specific condition in the nineteenth century; in fact Hardy cites a Public Health editorial of (1967), in which the commentator

> reiterated that only a small minority of food poisoning cases ever came to the notice of doctors: he estimated that the average adult accepted a couple of attacks a year of "mild or moderately severe" diarrhoea and vomiting subsiding within 48 hours, without requiring medical attention.[171]

[167] Hardy, 'Food, Hygiene, and the Laboratory', p. 295.
[168] Stevenson T., 'Poisoning by Sardines: A Toxic Ptomaine', *BMJ* (17th December 1892), pp. 1326-7.
[169] Vernon 'Pus', p. 293. Microbe-studies did not evolve into the separate medical specialty of bacteriology until the inter-war period. For more see Maulitz R.C., '"Physician Versus Bacteriologist": The Ideology of Science in Clinical Medicine', in Vogel M.J. and Rosenberg C.E. (eds), *The Therapeutic Revolution: Essays in the Social History of American Medicine* (Philadelphia: University of Pennsylvania Press, 1979), pp. 91-107.
[170] Hardy, 'Food, Hygiene, and the Laboratory', p. 300.
[171] Editorial, 'Food Poisoning', *Public Health* (1966-7) **81**, p. 49, cited in Hardy, 'Food, Hygiene, and the Laboratory', p. 310.

3.6 Conclusion

In an 1892 English translation of *Diseases of the Digestive Organs*, the pioneering German gastroenterologist Carl Anton Ewald (1845-1915) wrote, rather bluntly: 'it is unfortunate that the pathognostic importance of [*sarcina*] does not entitle it to the attention which it has received from physicians.'[172] Nonetheless, although it was never established as an aetiological agent, it remained the case that until the end of the nineteenth century *sarcina* offered the 'most direct indications' of disorder found in vomited matters.[173] As a marker for illness the presence of s*arcina* directed the clinician to a specific state of the digestive system and moreover to potential therapies.[174] Furthermore, the debates surrounding the nature and role of *sarcina* in morbidity are telling of the changing ways that practitioners were framing their understandings of the use of vomited matters in clinical diagnoses.

Whilst there was interest in gaining objective knowledge of illness using bodily matter (such as blood, sputum and pus) the use of vomited matters is indicative that, in everyday illness, biological and chemical laboratory testing largely served to confirm a clinical diagnosis, or to settle a doubtful diagnosis. Vomited matters were rarely, if ever, used to establish a specific diagnosis.[175] Indeed, as 'most diseases at this time were classified and recognised by their clinical symptoms, so the value of other types of knowledge in diagnosis, especially of causes that might no longer be active, was not obvious'; vomited matters were only significant when connected with their allied symptoms of nausea and vomiting.[176] The use of vomited matters therefore reflects what Stephen Jacyna has identified as the 'short-term project' of laboratory medicine, namely the solution of immediate clinical problems. Vomit analysis occurred only as an 'appendage to the ward' in certain cases, rather than as a prevailing mode of practice.[177] It complemented qualitative, macroscopic findings and patients' reports of their bodily experiences.

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[172] Ewald, *Disease of the Digestive Organs*, p. 345.
[173] Essex Wynter W. and Wethered F.J., *A Manual of Clinical and Practical Pathology* (London: J.&A. Churchill, 1890), p. 247.
[174] If they were thinking causally then it was multi-causal, not a single essential cause.
[175] Lawrence C., 'Incommunicable Knowledge: Science, Technology and the Clinical Art in Britain, 1850-1914', *Journal of Contemporary Histor*y (1985) **20:4**, p. 504.
[176] Worboys M., 'Was there a Bacteriological Revolution in Late Nineteenth-Century Medicine?' *Stud. Hist. Phil. Biol. & Biomedical Sci.* (2007) **38**, p. 34.
[177] The long-term project involved questions of normality and abnormality. Jacyna L.S., 'The Laboratory and the Clinic: The Impact of Pathology on Surgical Diagnosis in the Glasgow Western Infirmary, 1875-1910', *BHM* (1988) **62:3**, p. 385 and p. 405.

In not all cases of nausea and vomiting, however, was the ultimate cause unknown, or unsuspected. In Chapters Four and Five I turn to cases of sickness where the reason for these signs and symptoms was well-known, and physicians were not necessarily working towards a therapeutic response. The diagnostic significance of nausea and vomiting were predominantly removed, and attention turned towards meaning and experience.

CHAPTER FOUR:
MORNING SICKNESS

4.1 Introduction

In 1889 Mary Drew (1847-1927), the daughter of the great Victorian politician William Gladstone (1809-98), confessed to her mother a new appreciation for the physical and emotional difficulties faced by pregnant women:

> I feel how totally inadequate has been my sympathy or pity for those [women] in same circs. [i.e. pregnancy]. Back only aches occasionally but I feel horridly weak and *ill*, bad tongue, and beyond expression irritable with everybody and everything… I do so agree with Gerty in her estimate of the misery of the condition, and I think women are angels to bear it so perfectly, and wish I was more like them.[1]

Drew's observations were not unique. Experience of pregnancy was similarly expressed earlier in the decade by Queen Victoria (1819-1901) as 'aches… sufferings and miseries and plagues – which [women] must struggle against', and which 'utterly spoilt' the first two years of her marriage.[2]

The majority of nineteenth-century British women spent a significant part of their lives in pregnancy; in her study of *Childbearing in the British Aristocracy*, for instance, Judith Lewis calculated that between 1760-1860 women's childbearing period spanned eighteen years and produced an average of eight children.[3] Working class women may have had many more pregnancies, though these were likely to have been curtailed by illness or death in childbirth, and a number would not have progressed to full term. Given that current medical literature teaches us that morning sickness usually diminishes at the end of the first trimester (twelve weeks), it seems that many women could have spent around two years of their lives suffering from the condition.[4]

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[1] Mary Drew to Catherine Gladstone, c. 5th July 1889, Mary [Gladstone] Drew Papers, BL Add. MS. 46224, fos. 175-6, cited in Jalland P. and Hooper J. (eds), *Women from Birth to Death: The Female Life Cycle in Britain 1830-1914* (Brighton: Harvester, 1986), p. 134.
[2] Quotes in letters from Queen Victoria to Victoria, Princess Royal, 15th March 1858 and 21st April 1858, in Fulford R. (ed.), *Dearest Child: Letters between Queen Victorian and the Princess Royal, 1858-1861* (London: Evans Brothers, 1964), pp. 77-8 and p. 94.
[3] Lewis J.S., *In the Family Way: Childbearing in the British Aristocracy, 1760-1860* (New Brunswick, New Jersey: Rutgers University Press, 1986), pp. 122-3. Lewis used a sample of fifty women.
[4] See Tiran D., *Nausea and Vomiting in Pregnancy: An Integrated Approach to Care* (Edinburgh: Churchill Livingstone, 2004), p. 2. Birth-rates did vary between classes and over time, however. During

The growth of a baby, according to nineteenth-century literature, caused a variety of side-effects: toothache, excessive saliva, expansive appetites, heartburn, and of course, in the early months, nausea and vomiting.[5] The occurrence of these changes provided an opportunity for doctors to investigate and understand pregnancy more generally, and especially how women's bodies adapted to a new life within. As we recognise them today, acknowledgment and treatment of these conditions would fall into the remit of 'antenatal care'. However historians, including Ann Oakley and Patricia Jalland, have demonstrated that the development of formal 'antenatal care' was a twentieth-century phenomenon.[6] Nonetheless, although it cannot be considered nineteenth-century 'antenatal care', the causes, cures and meanings of these signs and symptoms of pregnancy were discussed and debated by both women and medical practitioners. In this chapter I explore how nausea and vomiting, as two of the many physical and emotional experiences that characterised pregnancy, were associated with more than their physiological and potentially pathological clinical presentations. Rather, they were seen within the frameworks of cultural and institutional views of women's bodies and minds, and, compared to the usual case for nausea and vomiting, served a purpose beyond raising awareness of bodily dysfunction.

The subordination of women as a result of men's ideological constructions of their frailty, particularly during pregnancy, has been a theme in recent history of medicine and women's studies. A key notion has been that many women endured, what Anne

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the early nineteenth century there was an increase in fertility in the labouring classes, remaining higher than the middle classes. Furthermore, although there was a fall in fertility post-1860, this was more gradual amongst the working classes, birth rates remaining high. See McLaren A., 'Women's Work and Regulation of Family Size', *History Workshop* (1977) **4**, p. 70. Simon Szreter writes on occupational and community differences amongst working-class fertility rates. See Szreter S., *Fertility, Class and Gender in Britain, 1860-1940* (Cambridge: Cambridge University Press, 1996), pp. 481-503. See also McLaren A., *Birth Control in Nineteenth-Century England* (London: Croom Helm, 1978), p. 11 and Seccombe W., 'Starting to Stop: Working-Class Fertility Decline in Britain', *Past and Present* (1990) **126**, p. 152.

[5] Blundell J., *The Principles and Practice of Obstetricy, as at Present Taught by James Blundell* (London: E. Cox, 1834), pp. 153-84; Bull T., *Hints to Mothers for the Management of Health during the Period of Pregnancy and the Lying-In Room*, new edn (New York: John Wiley & Sons, 1877), pp. 40-75; Drage L., 'Remarks Suggested by Dr. Clifford Allbutt's Paper upon Albuminuria in Pregnancy', *Lancet* (27th March 1897), pp. 875-6; Grigg J., *Advice to the Female Sex in General, Particularly those in a State of Pregnancy and Lying-In* (Bath: S. Hazard, 1789), pp. 74-139; Montgomery W.F., *An Exposition of the Signs and Symptoms of Pregnancy: With some other Papers on Subjects Connected with Midwifery,* from 2nd London edn (Philadelphia: Blanchard and Lea, 1857), pp. 71-93; 'Toothache', *MTG* (April-September 1843) **8**, p. 45; Blundell J., 'Lectures on the Gravid Uterus, and on the Diseases of Women and Children', *Lancet* (13th December 1828), pp. 321-6.

[6] Jalland P., *Women, Marriage and Politics 1816-1914* (Oxford: Oxford University Press, 1988), p. 141 and Oakley A., *The Captured Womb: A History of the Medical Care of Pregnant Women* (Oxford: Basil Blackwell Publisher Ltd., 1984).

Digby terms, a 'biological straitjacket'.[7] Digby argues that during the early to mid nineteenth century middle-class women in particular were depicted within gynaecological and psychiatric literature as frail and unstable.[8] Natural events occurring as part of women's lives, such as menarche, pregnancy, childbirth and the menopause, she claims, were scrutinised by doctors. Male professionals then provided 'a biological rationale for gender differentiation in society' and dictated social conventions regarding women's abilities and roles.[9] Whilst this view has been complicated by authors such as Elaine and English Showalter and Clare Hanson, who show that medical and social conventions were in fact co-constituted, I argue that the history of morning sickness revises these histories further.[10] In this sphere, medical 'knowledge' was not used to enforce women's subordination; rather morning sickness was seen as a beneficial and positive evolutionary and adaptive function, hindering the assertion that women were weakened and frail.

In this chapter I also nuance accepted narratives of the development of medical professionals as authorities on pregnancy during the nineteenth century. Ornella Moscucci and Ann Oakley suggest that the medicalisation of pregnancy was a twentieth-century development and that during the nineteenth century pregnancy 'did not constitute a medical phenomenon' in terms of its definition as pathology.[11] Whilst I broadly accept their view for the institutionalisation of knowledge and practice, Oakley does recognise that a *form* of medicalisation of pregnancy took place from as early as the seventeenth century, and more consistently during the nineteenth century. This involved the incorporation of pregnancy into medical discourse, and its medicalisation as *natural*, in which there were scales of correct reactions. Oakley writes that

> the authors of these [healthcare] books did not simply view pregnancy as a normal physiological function. To do that would have been to defeat their purpose, which was to provide information. What they did was a good deal more complex; essentially they constructed a schema

[7] Digby A., 'Women's Biological Straitjacket', in Mendus S. and Rendall J. (eds), *Sexuality and Subordination: Interdisciplinary Studies of Gender in the Nineteenth Century* (London: Routledge, 1989), pp. 192-220.
[8] Digby, 'Women's Biological Straitjacket', pp. 192-3.
[9] Digby, 'Women's Biological Straitjacket', p. 214.
[10] Showalter E. and Showalter E., 'Victorian Women and Menstruation', *Victorian Studies* (1970) **14:1**, p. 88 and Hanson C., *A Cultural History of Pregnancy: Pregnancy, Medicine and Culture, 1750-2000* (Basingstoke: Palgrave Macmillan, 2004), p. 3.
[11] Moscucci O., *The Science of Woman: Gynaecology and Gender in England, 1800-1929* (Cambridge: Cambridge University Press, 1990). Quote from Oakley, *The Captured Womb*, p. 12.

> of pregnancy which systematized what was taken to be the everyday experience of women. Thus systematized, this experience then came to be represented as technical-medical knowledge.[12]

In this chapter I contend that whilst pregnancy was increasingly incorporated into medical discourse and viewed as *natural*, medical practitioners did not entirely adopt morning sickness as part of a 'systematised' schema of pregnancy, or assert a distinctly 'technical-medical knowledge' regarding it. Despite attempts made by medical professionals to explain it and indicate how women ought to conduct themselves, the condition remained an individualised, culturally-informed encounter of sickness throughout the nineteenth century. Moreover, morning sickness specifically was perceived as a *normal* physiological function, rather than a *natural* experience defined by practitioners. This view, in part, reflected women's belief that nausea and vomiting were beneficial to pregnancy, which continued to frame even professional responses to the condition throughout the nineteenth century. It was also, to an extent, a result of the nature of morning sickness as an ill-defined and subjective condition, yet its occurrence was in-line with expected physiological functions. In this chapter I therefore aim to show how, medically and culturally, nausea and vomiting during pregnancy were perceived as normal and healthy, as opposed to natural, but potentially unhealthy.

I begin this chapter by discussing how nausea and vomiting were read as useful and positive signs of pregnancy. The onset of these symptoms served to indicate to women a variety of information about their pregnancy: the potential birth date, the sex of the baby, and a healthy progression. They also played an important role in doctors' dealings with pregnancy, for, if they were consulted, it was a clear sign of the condition. They were culturally and medically interpreted as protective responses to physiological changes occurring within the body. Due to this positive outlook, I demonstrate that physicians predominantly chose not to intervene, and at times encouraged the conditions' occurrence.

Whilst accepting that the story of morning sickness was far from linear, in the second section of this chapter I explore discourses surrounding physiological explanations for nausea and vomiting during pregnancy, and show them to have paralleled wider shifts in nineteenth-century medical practice from holistic, humoral pathologies, to

[12] Oakley, *The Captured Womb*, p. 14.

physiological-anatomical specificity. Terminology in medical discourse was particularly sensitive; hence I am explicitly conscious of the varying uses of 'sign' and 'symptom' as they were employed by nineteenth-century contemporaries, and discuss alterations in their usage. In so doing I investigate meanings behind the shift from nausea and vomiting as signs, indicating pregnancy, to symptoms, occurring as a result of pregnancy.[13] I demonstrate the extent to which pathological explanations of pregnancy vomiting were fractured, and how the opinion that it was a normal, functional occurrence prevailed.

When presenting during pregnancy, nausea and vomiting were typically framed as temporary and ultimately harmless physiological occurrences. Nonetheless, in the third section I draw on evidence that indicates women's want for relief from their suffering. At times this involved hospitalisation, however women primarily sought relief via recommendations in advice manuals and the experiences of female friends and family. I therefore consider how nausea and vomiting, when presented without a relationship to a serious health condition – as has been the focus in Chapters Two and Three – were conditions that could be accepted without any want of remedy.

Where medical professionals did assert a level of 'technical-medical knowledge' was in their response to the abnormal, severe vomiting of pregnancy, or *Hyperemesis Gravidarum*, especially in the late nineteenth century. In the final section of this chapter I examine how the construction and framing of this life-threatening condition had, paradoxically, the effect of situating ordinary nausea and vomiting firmly within the realm of harmless physiological occurrences that did not require medical intervention or explanation.

4.2 Nausea and Vomiting as Signs

The Secret is Out

Hanson writes that 'anxiety and indeterminacy' characterised pregnancy during the late eighteenth century, as 'it was impossible to have a certain diagnosis until a child could

[13] Though these terms were frequently used interchangeably, at other times the connotations are made clear and it is these cases which I have used as evidence.

literally be seen in the course of labour.'[14] The discussion of bodily changes, particularly the onset of nausea and vomiting, played an important role in this foremost concern for women: confirmation of pregnancy.[15] In 1815, for example, Elizabeth Shaw wrote to tell her husband John Shaw that their 'secret is out'; her vomiting each morning had made her companions aware of her pregnancy.[16] Elizabeth's morning sickness was clearly difficult to hide and reminds us that nausea and vomiting were conditions that it may not have been easy to experience privately. Emma Darwin (1808-96) also found herself in the 'usual wretched state' during the early months of her many pregnancies. The condition in which the 'poor soul' found herself, echoing her husband's propensity for sickness of the stomach, required 'no further explanation' to their friends.[17]

Nausea and vomiting also served as indications of how pregnancies were progressing. To the amazement of medical practitioners some women were reported to have accurately predicted the date on which birth would take place based on their experience of these signs.[18] One woman's predictive capabilities led her to be described as 'of acute intelligent mind' by the Irish obstetrician William Fetherston Montgomery (1797-1859). 'On asking how she was enabled to calculate with such accuracy', Montgomery wrote in 1856, 'she told me that she had always reckoned nine months from the first feeling of nausea, and had never been mistaken.'[19] The duration and severity of vomiting were also used by women and their doctors to predict the sex of the baby; although beliefs

[14] Hanson, *A Cultural History of Pregnancy*, p. 1. Hanson's choice of the word 'diagnosis' is misleading in this quote. It is evident that Hanson uses the word to denote recognition that a woman had been pregnant, but not necessarily by a medical professional, in whose realm technical diagnoses are generally considered to lie. However, Hanson is clear in her work in arguing that pregnancy, including diagnosis, was not wholly medicalised during the nineteenth century.

[15] It is this role, as a sign of pregnancy, which has been the focus of historians' attention to the condition. See Lewis, *In the Family Way*, p. 149; Oakley, *The Captured Womb*, p. 17; Gélis J., *History of Childbirth: Fertility, Pregnancy and Birth in Early Modern Europe*, Morris R. (trans.) (Cambridge: Polity Press, 1991), pp. 46-7. See also for pregnancy signs in earlier periods: McClive C., 'The Hidden Truths of the Belly: The Uncertainties of Pregnancy in Early Modern Europe', *SHM* (2002) **15:2**, pp. 209-27 and Porter R. and Hall L., *The Facts of Life: The Creation of Sexual Knowledge in Britain 1650-1950* (New Haven and London: Yale University Press, 1995), p. 52 and p. 78.

[16] Letter from Elizabeth Shaw to John Shaw, 31st March 1815, Shaw Letters, Shaw/43a, Special Collections and Archives, University of Birmingham.

[17] *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry-1242/ (letter no. 1242; accessed 15th July 2010). Her illness was specifically characterised by morning sickness.

[18] Lever J.C.W., 'On Some Disorders of the Nervous System associated with Pregnancy and Parturition', *Guy's Hospital Reports* (1847) **12**, p. 2. Jalland argues, however, that many women found it difficult to calculate confinement dates. Jalland, *Women, Marriage and Politics*, pp. 140-1.

[19] Montgomery, *An Exposition of the Signs and Symptoms*, p. 90.

varied regarding which conditions indicated a male or female foetus.[20] In their study of sexual knowledge in Britain 1650-1950, Roy Porter and Lesley Hall, for instance, find that male foetuses were deemed to give women an easier pregnancy than females.[21] In contrast, Jacques Gélis finds that in early modern Europe sickness during the first month indicated a male foetus, the belief being that only the male embryo was formed at that stage.[22]

Nausea and vomiting were thus considered meaningful signs about both the mother's body and her baby. Correspondence between women shows that a large proportion of these beliefs passed through generations.[23] Mary Drew was informed by her married sister that 'the sea sickness comes in with some as early as possible and is usually in the first 3 months.'[24] Literate women could also turn to advice manuals for guidance, where vomiting ranked highly in the list of signs of pregnancy.[25] Pye Henry Chavasse (1810-79) stated in *Advice to a Wife,* a typical advice manual of the early and mid nineteenth century, that it was 'one of the earliest symptoms of pregnancy; as it sometimes occurs a few days after conception, and, indeed, generally, not later than a fortnight or three weeks.'[26] Some of Chavasse's contemporaries, such as obstetrician Fleetwood Churchill (1808-78) and Thomas Bull, a physician accoucheur to the Finsbury Midwifery Institution, taught in their popular mid nineteenth-century texts, *On the Diseases of Women* and *Hints to Mothers* respectively, that vomiting could commence any time from conception to the third month of gestation.[27] Although it was openly accepted that

[20] Mary Noel to Judith Noel, 26th November 1791, cited in Elwin M., *The Noels and the Milbankes: Their Letters for Twenty-Five Years, 1767-1792* (London: Macdonald, 1967), p. 401. See also Tanner T.H., *On the Signs and Diseases of Pregnancy* (London: Henry Renshaw, 1860), p. 382.
[21] Porter and Hall, *The Facts of Life*, p. 52
[22] Gélis, *History of Childbirth*, p. 89.
[23] For example see the letter between Mary Noel and Judith Noel, 26th November 1791, which mentions that 'people always Spew with girls'. Cited in Elwin, *The Noels and the Milbankes*, p. 401.
[24] The name 'sea sickness', in this instance, merely referred to nausea and vomiting. Mary Drew to Lady Cowell-Stepney, n.d. [c.8th April 1886], M. Gladstone Drew Papers, BL Add. MS 46249, ff. 212-13, cited in Jalland, *Women, Marriage and Politics*, p. 140.
[25] We are unable, however, to determine whether they did so or not. See Mechling J., 'Advice to Historians on Advice to Mothers', *JSH* (1975) **9:1**, pp. 44-63.
[26] Chavasse P.H., *Advice to a Wife on the Management of her own Health, and on the Treatment of some of the Complaints Incidental to Pregnancy, Labour, and Suckling*, 6th edn (London: John Churchill and Sons, 1864), p. 40. Chavasse's works on maternity ran into numerous editions and were translated into multiple European and Asian languages. See 'Obituary. Pye Henry Chavasse', *BMJ* (27th September 1879), p. 521.
[27] Churchill F., *On the Diseases of Women; Including those of Pregnancy and Childbed*, 4th edn (London: Longman and Co, 1857) pp. 526-7 and Bull, *Hints to Mothers*, p. 59. The first edition of Bull's *Hints to Mothers* was published in 1837 and had fourteen editions by the mid nineteenth century. In his obituary it was noted that Churchill's *Diseases of Women* was considered a textbook for over twenty years. See 'Obituary. Fleetwood Churchill', *BMJ* (16th February 1878), pp. 247-8.

sickness was not necessarily present in all pregnancies, it was considered 'a frequent accompaniment'.[28]

Women were certainly well aware of the close relationship between nausea and vomiting, and pregnancy. According to Cynthia Huff's reading of British women's diaries, '[t]he most common epithet for describing pregnancy, especially in its early stages, is *unwell*.'[29] In fact 'many who have had families,' Chavasse wrote, 'place more reliance on this symptom than any other.'[30] The absence of nausea and vomiting in a suspected pregnancy could in itself provoke concern and confusion.[31] Women themselves were encouraged to be aware of these indicators of pregnancy. In Henry Arthur Allbutt's *Wife's Handbook* (1886), he warned that as a married woman 'may at any time conceive [...] it is necessary that she should know what are the signs of pregnancy, especially those earlier ones, an acquaintance with which may save her from much bad health'.[32] However, women's home manuals rarely gave specific advice on how to distinguish between pregnancy vomiting and vomiting caused by a threatening disease or other bodily disorder.[33] In comparison, doctors needed both an awareness of the connection between vomiting and pregnancy, and the skill to distinguish it from other potential causes.

Confirmation of Pregnancy

A medical practitioner's reputation and status depended greatly upon their ability to accurately identify and alleviate a condition. During the eighteenth century the British upper classes made professional confirmation of pregnancy a custom, with consultation of a physician-accoucheur becoming still more common amongst the wealthiest in the

[28] Chavasse, *Advice to a Wife*, p. 40; Allbutt H.A., *The Wife's Handbook: How a Woman Should Order Herself during Pregnancy in the Lying-In Room, and after Delivery* (London: W. J. Ramsay, 1886), p. 6.
[29] Huff C.A., 'Chronicles of Confinement: Reactions to Childbirth in British Women's Diaries', *Women's Studies International Forum* (1987) **10:1**, p. 65.
[30] Chavasse, *Advice to a Wife*, p. 40.
[31] For instance, Mary Noel writes to Judith Noel that she must be 'breeding' despite the lack of sickness – October and November 1791, in Elwin, *The Noels and the Milbankes*, pp. 389-401.
[32] Allbutt, *The Wife's Handbook*, pp. 5-6. Allbutt was struck off the Medical Register following the publication of *The Wife's Handbook* as it was deemed to support contraception. For more see D'Arcy F., 'The Malthusian League and the Resistance to Birth Control Propaganda in Late Victorian Britain', *Population Studies* (1977) **31:3**, pp. 429-48. One woman who was concerned that potential pregnancy was masking a health problem was Sophia Sussana Noel, who wrote to her aunt on the 24th October 1779, cited in Elwin, *The Noels and the Milbankes*, p. 147. Other women hoped that their nausea and vomiting signalled pregnancy, for example see Georgina, Duchess of Devonshire, to Thomas Coutts, 23rd September 1789, cited in Bessborough, Earl of (ed.), *Georgiana: Extracts from the Correspondence of Georgiana, Duchess of Devonshire* (London: John Murray, 1955), p. 162.
[33] Chavasse was an exception. See Chavasse, *Advice to a Wife*, p. 74.

nineteenth century.[34] A misdiagnosis of pregnancy would not only reflect negatively on the practitioner's reputation, it could also have ill-health consequences for the woman. By defining its onset practitioners identified whether or not nausea and vomiting were a result of pregnancy, or a bodily dysfunction that would require medical intervention. Their occurrence therefore assisted confirmation of conception and was seen to discount the likelihood of a more health-threatening concern.

Due to the severity of conditions other than pregnancy that could be accompanied by vomiting, it was of the utmost importance that doctors learnt to navigate these signs in the female body. Yet the act of doing so was riddled with problems. James Blundell (1790-1878), professor of obstetrics and lecturer on diseases of women, voiced this universal concern in Guy's Hospital in 1828:

> It is obvious that you must not hastily conclude that a woman is pregnant, merely because she is attacked with vomitings and retchings in the mornings, inasmuch as these retchings and vomitings in women, as in ourselves, may be produced by a variety of other causes.[35]

The task of confirming pregnancy was challenging, not least because physicians were reluctant to perform vaginal or abdominal examinations, and women reluctant to submit to them.[36] The approaches used to diagnose pregnancy increased over the nineteenth century, but laboratory pregnancy tests were not introduced until the 1920s.[37]

Due to these considerations nineteenth-century medical men were often required to rely on the patient's narrative. However, in addition to being deceptive and disguising other health conditions, nausea and vomiting could also be used, purposefully or otherwise, by a knowledgeable woman.[38] Dr Reid, consulting physician-accoucheur to the St Giles

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[34] Oakley, *The Captured Womb*, p. 17 and p. 28. See Close A.W., 'Diagnosis of Pregnancy', *MTG* (September-March 1845-6) **13**, p. 394 for how a misdiagnosis of pregnancy might damage a physician's reputation.

[35] Blundell, 'Lectures on the Gravid Uterus' (1828), p. 323.

[36] See Digby A., *Making a Medical Living: Doctors and Patients in the English Market for Medicine, 1720-1911* (Cambridge: Cambridge University Press, 1994), p. 263, for the difficulties of physical examinations.

[37] Bird G., 'Observations on the Existence of Certain Elements of the Milk in the Urine during Utero-Gestation: and on the Application of this Fact to the Diagnosis of Pregnancy', *Guy's Hospital Reports* (1840) **5**, pp. 15-26. The diagnosis of pregnancy remained subjective throughout the century. See Lee R.G., 'Notes of Lectures on Midwifery and Diseases of Women and Children', *St George's Hospital Reports* (1872-4) **7**, pp. 43-4. For reference to reliable pregnancy testing see Oakley, *The Captured Womb*, pp. 17-19.

[38] Robb J.J., *Vomiting: a Symptom in Disease, its Importance in Diagnosis and Treatment*, Unpublished MD Thesis (University of Glasgow, 1895), p. 51.

Infirmary, published a lengthy article in the *Lancet* in 1838 in which he addressed the falsity of certain 'signs and symptoms of pregnancy'.[39] Reid complained that in 'illegitimate pregnancy we have the greatest difficulties to contend with; for, far from the female affording us any aid in forming our opinion, she says everything calculated to mislead us.'[40] Deception was not always considered to have been intentional, mistakes being forgiven if the pregnancy was unwanted. The 'celebrated Parisian surgeon' Alfred Velpeau (1795-1865), suggested in *A Complete Treatise of Midwifery* (1852) that women experienced signs depending on whether or not they desired pregnancy.[41] Velpeau judged that women, 'like all the rest of the human race, easily believe what they desire, and are willing to conceal even from themselves what they dread.'[42]

Nature's Safeguard

Once pregnancy was confirmed, how was vomiting understood to affect the mother? In 1813 Frances, Countess of Morley (1782-1857), wrote to her sister-in-law that 'in a moral point of view I think I ought to encourage the sickness to the utmost – I wished so much to be sick at first that it w^{d} be quite wicked & ungrateful in me, now that I have the power, not to puke all day long.'[43] Frances was not unusual in wanting to encourage vomiting; it was thought by other women to signal or encourage healthy pregnancy. In 1852 the grandmother of the newly-wed Blanche, Countess of Airlie (1829-1921), wrote that it was '[v]ery good news of Blanche – the best, that is safest sign is being very sick'.[44]

That 'a sick pregnancy is a safe one' was established by experience.[45] Montgomery described the role of vomiting as a protector of mother and baby:

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[39] Reid J., 'Observations on the Fallacy of the Individual Signs and Symptoms of Pregnancy', *Lancet* (22nd December 1838), pp. 463-8.
[40] Reid, 'Observations on the Fallacy of the Individual Signs', p. 463.
[41] Quote from 'Obituary. M. Velpeau of Paris', *BMJ* (31st August 1867), p. 195.
[42] Velpeau A.A.L.M., *A Complete Treatise on Midwifery: or, the Theory and Practice of Tokology: including the Diseases of Pregnancy, Labor, and the Puerperal State*, Meigs C.D. (trans.), 4th edn (Philadelphia: Lindsay and Blakiston, 1852), p. 150.
[43] Lady Morley to Mrs. Villiers, 4th November 1813, Morley Papers, Add. MSS 48236, cited in Lewis, *In the Family Way*, p. 140.
[44] Letter from Maria Josepha Lady Stanley to Lady Stanley, 26th March 1852, in Mitford N. (ed.), *The Stanleys of Alderley: Their Letters Between the Years 1851-1865* (London: Hamish Hamilton, 1968), p. 42.
[45] Women were being advised of this in the eighteenth century. See Mears M., *The Pupil of Nature, or Candid Advice to the Fair Sex* (London: The Authoress, 1797), pp. 18-19 and Grigg, *Advice to the*

> Nature, as a safeguard, resorts to vomiting, thereby, as it were, declaring her opinion that there is something superfluous in the system, the evacuation of which is not only beneficial to the parent, but subservient to the welfare of the child, which we know is but too surely threatened when in the early months the disposition to vomit suddenly subsides.[46]

Pregnancy vomiting was thought to prevent spontaneous abortion.[47] 'When within moderate bounds', the obstetrician Edward Rigby (1804-60) lectured in the mid 1840s, it 'is generally looked upon as a favourable symptom, from its tending to prevent the formation of too much blood, and thereby, the disposition to plethora which is so frequent a cause of abortion.'[48] The idea of 'plethora', or an excess of blood in the body's system, was central to understandings of menstruation and pregnancy at the time; blood-letting by knife or leech was a key therapy for problems during gestation.[49] Although Oakley states that 'the beginning of the end of bloodletting therapy came in 1843', it began, of course, much earlier, when the French pathologist Gabriel Andral (1797-1876) revealed by experiment the diminished numbers of red blood cells in pregnant women, and there is evidence that it was still a professionally supported practice in Britain decades after this.[50]

That pregnancy vomiting could bear some relationship to menstruation would not have been an unfamiliar idea to nineteenth-century medical men. The physician and chemist William Brownrigg (1712-1800) wrote of a patient that her vomiting 'might perhaps have taken the place of her menstrual periods, as it does in pregnant women'.[51] A belief in the necessity of a fine balance of bodily fluids meant that pregnancy vomiting was also considered, at times, to be the body ridding itself of the 'evil humors that induced

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Female Sex, p. 78. See for the nineteenth century Tweedie A., *The Library of Medicine, Volume VI Midwifery* (London: Whittaker and Co., 1841), p. 61 and '"A Course of Lectures on Practical Midwifery," delivered by Edward Rigby, M. D.', *MTG* (September-March 1845-6), p. 312.

[46] Montgomery, *An Exposition of the Signs and Symptoms*, p. 25.

[47] Although when pregnancy vomiting was suffered abnormally severely it could in fact bring on abortion. See Hadden W.B., 'Medical Report. 1886', *Saint Thomas's Hospital Reports* (1886) **16**, p. 294 and Ormerod J.A. and Bowlby A.A., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1890', *Saint Bartholomew's Hospital Reports* (1891) **27**, pp. 38-9.

[48] '"A Course of Lectures on Practical Midwifery"', p. 312.

[49] Oakley, *The Captured Womb*, pp. 21-2; Mears, *The Pupil of Nature*, p. 77.

[50] Oakley, *The Captured Womb*, p. 22.

[51] Ward J.E. and Yell J. (eds), *The Medical Casebook of William Brownrigg, M.D., F.R.S. (1712-1800) of the Town of Whitehaven in Cumberland* (London: Wellcome Institute for the History of Medicine, 1993), p. 90. The casebook's contents date from 1737-42.

it'.[52] In his study of the *Normal and the Pathological*, Georges Canguilhem writes that Hippocratic medicine supposed that 'disease [was] a generalized reaction designed to bring about a cure; the organism develops a disease in order to get well.'[53] Indeed, despite 'growing plausibility of views emphasizing disease specificity' in the early to mid nineteenth century, understandings that vomiting could be the pregnant body's method of curing itself continued.[54] Sickness was thus frequently used for the confirmation of pregnancy, but was not in itself regarded as a medical condition *per se*.

4.3 Healthy or Pathological?

Encouraging Nausea and Vomiting

In the early nineteenth century medical men justified intervention in pregnancy vomiting due to their humoral models of pathology, by which means they aimed to mirror and enhance the benefits of the naturally-occurring conditions. The use of emetics was widely practised.[55] For example, in 1858 William Tyler-Smith (1815-73) recommended vomiting and wrote that it acted 'by getting rid of vicious gastric secretions, and contributing to restore the stomach to a healthy state; such patients should be puked occasionally with warm water, camomile tea, or a mustard emetic.'[56] Emetics were also frequently administered as part of an acknowledgement by doctors that 'nausea is so much more distressing than vomiting', the emetic acting as a method of easing the unpleasant giddiness.[57] These therapeutic practices continued into the second half of the nineteenth century, when doctors typically used ipecacuanha and nux vomica.[58] Vomiting and bleeding were associated with the idea of 'keeping the body

[52] Eshleman M.E., 'Diet during Pregnancy in the Sixteenth and Seventeenth Centuries', *JHMAS* (1975) **30:1**, p. 31.
[53] Canguilhem G., *On the Normal and the Pathological*, Fawcett C.R. (trans.) (Dordrecht, Holland: D. Reidel Publishing Company, 1978), p. 12.
[54] Rosenberg C.E., 'The Therapeutic Revolution: Medicine, Meaning, and Social Change in Nineteenth-Century America', in Vogel M.J. and Rosenberg C.E. (eds), *The Therapeutic Revolution: Essays in the Social History of American Medicine* (Philadelphia: University of Pennsylvania Press, 1979), p. 15.
[55] Denman T., *An Introduction to the Practice of Midwifery*, vol. 1 (London: J. Johnson, 1794), pp. 277-8; Blundell J., 'Lectures on the Gravid Uterus, and on the Diseases of Women and Children', *Lancet* (3rd January 1829), p. 417; Mackenzie F.W., 'Relations of Uterine to Constitutional Disorder', *London Journal of Medicine* (1851) **3:36**, pp. 1074-102; Barnes R., 'Lumleian Lectures: On the Convulsive Diseases of Women', *Lancet* (19th April 1873), p. 551.
[56] Tyler-Smith W., *A Manual of Obstetrics* (London: John Churchill, 1858), pp. 115-16.
[57] Quote from Churchill, *On the Diseases of Women*, p. 533.
[58] Fuller C.C., 'On the Action of Ipecacuanha', *Lancet* (4th December 1869), p. 768. Ipecacuanha and nux vomica were also recommended domestically. See Norton J.E., *Homoepathic Family Medicine*, 2nd edn (London: T. Sanderson, 1860), p. 84 and Epps J., *Domestic Homœpathy*, 3rd American from 4th London edn (Boston: Otis Clapp, 1848), p. 190.

gently open', and as such purgatives, such as figs, prunes, manna or senna, were considered by doctors to be an important part of any pregnant woman's diet.[59] Dietary means were also employed to settle the stomach, with effervescing draughts, champagne, other alcohols and sugars recommended. Treatment, however, generally depended on the individual woman and the severity of her vomiting, and as such each case was regarded as unique; there was no systematised response.[60]

Although there was a growing tendency towards medical intervention during this era it would be anachronistic to regard pregnancy and its associated bodily changes as medicalised. Doctors intervened only when necessary, demonstrating an ever-increasing interest in, rather than control over, the condition of pregnancy vomiting. The incorporation of knowledge relating to pregnancy vomiting into the medical sphere is, however, evidenced by a shift in terminology. The Latinate terms *emesis gravidarum* and *vomitus gravidarum* were rarely employed in medical and scientific literature, even at the end of the nineteenth century.[61] However, prior to the 1830s the name most generally used was descriptive – 'nausea and vomiting of pregnancy', or 'pregnancy vomiting' – yet by 1856 Tyler-Smith noted that the new phrase 'morning sickness' had 'become almost vernacular'.[62] The use of this term appears to have originated in specialist lectures of the 1830s and 1840s, and thereafter appears frequently printed in italics or within quotation marks, indicative of its novelty.[63] A number of sources do indicate dissatisfaction with the term 'morning sickness', owing to the fact that not all pregnant women suffered from the condition and because it was seen to occur at any

[59] Buchan W., *Domestic Medicine: or, a Treatise on the Prevention and Cure of Diseases*, 11th edn (London: A. Strahan, T. Cadell, J. Balfour and W. Creech, 1790), p. 316. Buchan wrote within the practical understanding that the body would repair itself, and therefore would have considered the vomiting of pregnancy to be a natural recovery, although others' view of bleeding and purging would have been more directly concerned with humoral rebalance of the constitution.
[60] Churchill, *On the Diseases of Women*, p. 532.
[61] Bacon C.S., 'Dietetics of Obstetrics', *Journal of the American Medical Association* (1899) **25**, pp. 1416-19; Evans D.J., 'On the Ætiology of the Nausea and Vomiting of Pregnancy', *American Gynæcological and Obstetrical Society* (January 1900), pp. 1-7. Evans was a Canadian obstetrician, but his textbook *Obstetrics: A Manual for Students and Practitioners* was published in London (1901).
[62] Tyler-Smith W., 'A Course of Lectures on the Theory and Practice of Obstetrics', *Lancet* (23rd February 1856), p. 198 and Arthure H.G., 'The London Obstetrical Society', *Proceedings of the Royal Society of Medicine* (1969) **62:4**, pp. 363-6. Note that Tyler-Smith had used the term 'morning sickness' previously in his earlier lectures. See Tyler-Smith W., 'Lectures on Parturition, and the Principles and Practice of Obstetricy', *Lancet* (11th March 1848), pp. 277-80.
[63] Blundell, 'Lectures on the Gravid Uterus' (1828), p. 323; Heming G.O., 'Practical Facts and Observations on Diseases of Women, and some Subjects Connected with Midwifery', *Lancet* (22nd June 1844), p. 409; Tyler-Smith, 'Lectures on Parturition', p. 277. The term 'morning sickness' was also applied to any vomiting generally occurring in the morning as a result of ill-health, whether it be in men or women, and was frequently used in relation to alcoholism.

time of day.[64] The blanket name was hiding many complexities. In 1892 a dissertation written by J.M.H. Martin, a Glasgow MD candidate, reprimanded the deception caused by utilising the term 'morning sickness', calling it 'an unfortunate and unmeaning term' as:

> retching and sickness are common enough in drunkards (vomitus matutinus), gastric catarrh, metritis, irritable conditions of the uterus and appendages, in amenorrhoea, dysmenorrhoea, and the irregular period of menstruation about the climacteric, and, according to some authors, is persistent in carcinoma uteri, and a further cause of prostration, hastening the fatal issue.[65]

Despite acknowledgement of its varied uptake, use of the term from the 1840s onwards did not lead to confusion, demonstrating a general knowledge and acceptance of what the term referred to.

An increasingly standardised terminology did not reflect a standard understanding and response to pregnancy vomiting. In 1860 the physician Thomas Inman (1820-76) phrased the title of his paper as 'On Morning Sickness: Its Significance as a Symptom,' and began it by declaring that:

> There are many phenomena of disease so common that we fancy we know all about them, and this prevents our thinking; yet no sooner do we begin to examine into them than we find not only that our knowledge is scanty, but that they involve considerations of the highest interest, and lead us into the most recondite problems of physiology.[66]

Inman openly voiced concern about the absence of a satisfactory explanation of pregnancy vomiting at a time when understandings of bodily illness were being re-framed within a new anatomical, localised outlook. Nervous explanations and therapeutic responses to pregnancy vomiting from the mid to late nineteenth century do, however, reveal a pattern of change in line with more general trends in medicine. For example, the idea that vomiting was a healthy part of pregnancy was re-articulated from a humoral to a nervous, technological metaphor. The prominent obstetrician Robert

[64] Allbutt, *The Wife's Handbook*, p. 6; Inman T., *Foundation for a New Theory and Practice of Medicine*, 2nd edn (London: John Churchill, 1861), pp. 226-9; Churchill, *On the Diseases of Women*, pp. 526-7.
[65] Martin J.M.H., *Hyperemesis Gravidarum, with Reference to its Etiology and Treatment* (Manchester: Examiner Printing Works, 1892), p. 3.
[66] Inman T., 'On Morning Sickness: Its Significance as a Symptom', *BMJ* (24th March 1860), p. 223.

Barnes (1817-1907) compared pregnancy vomiting to 'a safety-valve discharging the superabundant nerve-force, which might otherwise result in convulsion, abortion, or other mischief.'[67] From the earlier idea of a 'plethora' needing to be drained, understandings in the latter decades were often clarified in terms of hydraulic pressure or pressurised steam needing release. The notion that pregnancy vomiting was useful and healthy therefore remained consistent.

Morbid Symptoms?

Despite continued acceptance of the positive influence nausea and vomiting had on pregnancy, concern about the dual nature of these symptoms – that nausea and vomiting were generally negative reflections on health – was voiced by a handful of nineteenth-century practitioners. This can be seen as a reflection of the increasing inclusion of pregnancy in medical specialities, such as gynaecology and obstetrics, during which time doctors came to use the term morning sickness on a more uniform basis. As sources previously quoted have shown, during the early to mid nineteenth century the term *symptom of pregnancy* became for a time interchangeable with *sign of pregnancy*. Rather than being indicative of the condition of pregnancy, a symptom had an implicit negative connotation, corresponding with disease.

The association of nausea and vomiting with other disagreeable conditions of pregnancy was certainly evident. For example, William Buchan (1729-1805) in his *Domestic Medicine*, which went through at least 142 English language editions from 1769-1871, listed nausea and vomiting alongside foulness of the stomach, morbific matter of ulcers, gout, colic, worms, bleeding piles, violent passions and, simply, the *menses*.[68] The occurrence of such symptoms led some medical authors to equate pregnancy with sickness. In the 1857 edition of his book Montgomery wrote that 'if, with a few, pregnancy has deserved the name of nine-month's [sic] malady, fully an equal number suffer little, or no, inconvenience, and with some it is a period of decided improvement in health'.[69] Contemporary with Montgomery and more extreme was the view set out in *Aristotle's Works*:

[67] Barnes, 'Lumleian Lectures', p. 551.
[68] Buchan, *Domestic Medicine*, pp. 315-16. For more information on authorship, readership, content and theoretical stance of the book, see: Rosenberg C.E., '"The Fielding H. Garrison Lecture": Medical Text and Social Context: Explaining William Buchan's "Domestic Medicine"', *BHM* (1983) **57:1**, pp. 22-42.
[69] Montgomery, *An Exposition of the Signs and Symptoms*, p. 49.

> A woman, after conception, during the time of her being with child, ought to be looked upon as indisposed or sick, though in good health; for child-bearing is a kind of nine months' sickness, being all the time in expectation of many inconveniences which such a condition usually causes to those that are not well governed during that time.[70]

Thomas Denman (1733-1815) also recognised how pregnancy could be regarded as a sickness, but argued that only when its symptoms were irregular or excessive could it be termed a disease.[71] Similarly, E.W. Roughton (d.1913), an obstetric assistant at St Bartholomew's Hospital, wrote in 1885 that '[a]lthough pregnancy cannot be called a disease, yet it produces such profound changes in those physiological processes which by working harmoniously constitute health, that it is a very important predisposing cause of many dangerous diseases'.[72]

The close relationship of pregnancy vomiting to more serious illnesses, particularly those that could occur as a result of pregnancy, meant that in some cases the conditions were not differentiated. In his 1829 lectures Blundell referred to the irritability of the bowels and stomach which accompanied pregnancy as 'diseases', declaring that 'by the diseases of pregnancy, Gentlemen, you are to understand those which arise from pregnancy as their cause, or which, from their accidental connexion with gestation, required a modified form of treatment'.[73] However, most authors echoed Denman's view that conditions such as the nausea and vomiting of pregnancy only warranted being called morbid, or diseases, when they were excessive. Even when labelled as 'diseases', nausea and vomiting were merely troublesome, or 'teasing': just another in the list of frequent complaints.[74]

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[70] *Aristotle's Works: Containing Direction for Midwives and Counsel and Advice to Child-Bearing Women, with Various Useful Remedies* (London: Printed for the Booksellers, 1861), p. 20.
[71] Denman, *An Introduction to the Practice of Midwifery*, vol. 1, p. 259.
[72] Roughton E.W., 'Pernicious Vomiting of Pregnancy', *Lancet* (5th September 1885), p. 425.
[73] Blundell, 'Lectures on the Gravid Uterus' (1829), p. 417.
[74] Moss W., *An Essay on the Management, Nursing, and Diseases of Children, from the Birth: and on the Treatment and Diseases of Pregnant and Lying-In Women: with Remarks on the Domestic Practice of Medicine*, 3rd edn (Egham: C. Boult, 1800), p. 350; Clarke J., *Practical Essays on the Management of Pregnancy and Labour; and on the Inflammatory and Febrile Diseases of Lying-In Women*, 2nd edn (London: J. Johnson, 1806), pp. 1-2.

A Reflex Manifestation

Discussions of the morbidity of morning sickness broadly confirm the arguments presented by Oakley and Moscucci that pregnancy was not in fact medicalised during the nineteenth century. However, as Oakley also argues, although medical men claimed to work with nature to ensure safe and healthy pregnancies 'they were also at pains to provide an explanation as to why these should occur.' and for this they looked to an 'objective', physiological view of the body[75] A localised anatomical outlook encouraged gynaecologists' focus on the reproductive organs, particularly from the 1860s onwards, and this in turn led to an expansion of gynaecological surgery.[76] This shift from the observation of the 'whole woman' to her reproductive system drew attention to the ways in which one organ might stimulate another by sympathy. Physiologically, pregnancy vomiting at the mid nineteenth century was understood principally within the explanatory framework of reflex actions. Marshall Hall's reflex theory 'explained and illuminated' many of pregnancy's physiological conditions for nineteenth-century doctors.[77] This theory, as we have seen in Chapter Two, was a key part of the dominant language encompassing both male and female diseases, although the sites of irritation varied between sexes. Moscucci writes that,

> gender differences were represented in terms of a different weighting between the controlling and automatic sectors of the nervous system; while the higher intellectual faculties played the dominant role in men, an imbalance of physical over mental events was posited in women.[78]

From the beginning of the century many doctors argued that 'consent between [the stomach] and the uterus [was] peculiarly frequent, and often violent.'[79] As such, many of the diseases of women were attributed to the uterus.[80] Thus at 'times of intensified sexual activity such as childbirth' women were most affected, and from the moment of conception, the changing shape, size, and position of the reproductive organs could stimulate a reflex action affecting the breasts, stomach, mind and emotions.[81] In 1848

[75] Oakley, *The Captured Womb*, p. 21.
[76] Moscucci, *The Science of Woman*, p. 108.
[77] 'Death of Marshall Hall', *Lancet* (15th August 1857), p. 173.
[78] Moscucci, *The Science of Woman*, p. 105.
[79] Denman, *An Introduction to the Practice of Midwifery*, vol. 1, p. 263.
[80] Douglas Wood A., '"The Fashionable Diseases": Women's Complaints and their Treatment in Nineteenth-Century America', *Journal of Interdisciplinary History* (1973) **4:1**, pp. 25-52.
[81] Moscucci, *The Science of Woman*, p. 105.

Tyler-Smith attributed nausea and giddiness to a reflex of the irritated uterine nerves which in turn influenced the brain.[82]

In 1871 there was a lengthy discussion on pregnancy vomiting at the Obstetric Society, in which reflex actions loomed large.[83] Amongst the most prominent ideas aired were that the condition was produced by flexions of the gravid uterus, stretching of the uterine fibres, and pressure on the abdominal viscera. On speaking of the idea of sympathy of the stomach, in 1878 the *Lancet* published an article written by a Chicago practitioner, M.O. Jones, who wrote that '[p]athologists (many, at least) attribute this reflex manifestation to the distension and development of the dense uterine structure after conception', whilst others considered it to be dependent on the ovaries.[84]

With the number of physiological-anatomical investigations into the pneumogastric nerve and the medulla oblongata growing, explanations in terms of a less direct role of the reproductive organs were also voiced. In 1887, for instance, the *BMJ* published an obstetric memorandum in which James Oliver, who frequently authored articles on obstetrics and gynaecology, wrote that vomiting usually occurred only in early pregnancy as 'in the course of a few months, through habit, the pneumogastric centre becomes more tolerant'.[85] The concept of a vomiting centre accommodated theories of pregnancy vomiting that saw irritation removed from the site of the uterus. For example, Martin suggested that due to the close proximity of the respiratory and vomiting centres, the lung and cardiac complications that often accompanied pregnancy could themselves produce the gastric irritation.[86] Alternatively, blood toxaemias that excited the nervous system or the vomiting centre itself were also given as explanations.[87] Variations in blood pressure causing nutritional or other circulatory changes were additionally suggested as possible causes of an abnormal condition of the vomiting centre.[88] Thus a wide array of theories were suggested, but to what extent did they shape practice, and alternatively, what explanations can be 'read' from practices?

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[82] Tyler-Smith, 'Lectures on Parturition', p. 277.
[83] See 'Obstetrical Society of London', *Lancet* (29th April 1871), pp. 574-6.
[84] Jones M.O., 'The Vomiting of Pregnancy and Its Treatment', *Lancet* (23rd February 1878), p. 268 and 'Medical Society of London', *Lancet* (14th December 1878), p. 846.
[85] Oliver J., 'The Cause of Morning Sickness during Pregnancy', *BMJ* (1st October 1887), p. 717.
[86] Martin, *Hyperemesis Gravidarum*, p. 28.
[87] Sinclair W.J., Evans D.J., Burnett W. and Giles A.E., 'Obstetrics and Gynaecology', *Lancet* (28th August 1897), p. 26.
[88] Evans, 'On the Ætiology', p. 1.

Doctors' interventions were aimed at managing the bodily processes which resulted in nausea and vomiting, specifically by diminishing the excitability of the stomach, nerves and uterus. These methods were in line with common approaches to managing nausea and vomiting in other illnesses, and just as with these symptoms more generally, the therapeutic benefits of one drug over another were often disputed. For pregnancy vomiting various sedative concoctions were employed.[89] The use of opium in particular was a matter of continuous debate, due to its potential effect on both the brain and the body.[90] Similarly, the therapeutic success of external applications were deliberated; liniments of opium or morphia, balms, fomentations (warm compresses), and counter-irritation of the epigastrium by blisters were all suggested.[91] An 1868 *Lancet* report on 'Hospital Out-Patient Practice', which recounted the procedures of several practitioners who had met with pregnancy vomiting, cited belladonna as the most successful therapeutic agent for diminishing reflex excitability associated with pregnancy.[92] Hydrocyanic acid, nitrate of silver, nux vomica, antipyrin and cocaine had also been offered to sufferers.

Pregnancy vomiting therapies were usually combined with the more familiar remedies of rest, prescribed bodily positions during meals, and a bland, dietetic system.[93] In a rare expansion upon the treatment offered for pregnancy vomiting in hospitals, the authors of St Thomas's Hospital Reports for the year 1897 noted that two patients were relieved by means of 'rest, aperients, &c'.[94] Rest and diet were prescribed for pregnancy vomiting in St Thomas's into the early twentieth century.[95]

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[89] There were a wide range of sedatives being used at this stage as a result of the numerous drugs that were isolated, concocted, or discovered in the period 1800-40, including morphine, quinine and iodine. Haley B., *The Healthy Body and Victorian Culture* (Cambridge, Massachusetts and London: Harvard University Press, 1978), p. 5.

[90] Supporting the use of opium at this time were: Grigg, *Advice to the Female Sex*, p. 79; Merriman S., 'Cases of Premature Labour Artificially Induced in Women with Distorted Pelvis; to which are subjoined, some Observations on this Method of Practice', *Medical Chirurgical Transactions* (1812) **3**, p. 139; Churchill, *On the Diseases of Women*, p. 534; Inman, 'On Morning Sickness', p. 224. Blundell denied opium was effectual, instead recommending mild evacuants – Blundell, *The Principles and Practice of Obstetricy*, p. 177.

[91] Merriman, 'Cases of Premature Labour Artificially Induced', p. 139; Tyler-Smith, 'Lectures on Parturition', p. 277.

[92] See 'Hospital Out-Patient Practice', *Lancet* (22nd February 1868), pp. 255-6.

[93] Small debates appeared from time to time. See for example Roberts L.D., 'The Vomiting of Pregnancy and Its Treatment', *Lancet* (2nd March 1878), p. 330 and Duncan W., 'On a New Method of Treating the Vomiting of Pregnancy', *Lancet* (15th October 1887), pp. 754-5.

[94] Stabb A.F., 'Report of the In-Patient Department for Diseases of Women for the Year 1897', *Saint Thomas's Hospital Reports* (1898) **26**, p. 410.

[95] Bell R.H., 'Report of the In-Patient Department for Diseases of Women for the Year 1902', *Saint Thomas's Hospital Reports* (1904) **31**, p. 272.

4.4. The Sick Role

Morning Sickness in Hospitals

As I have shown, by the mid nineteenth century pregnancy vomiting lay, at times, on the borderline between the normal and pathological in medical discourse. Vomiting in itself could be either, or both, a normal physiological function or pathological. In pregnancy, however, it had a clear cause, and one that was looked upon positively in many contexts. Where, when and to what extent then, was it responded to by women with concern, or requests for intervention? Women themselves were usually responsible for consulting a practitioner when they wanted help; though in some cases husbands would have controlled this. Moscucci finds that access to gynaecology specialists increasingly appealed to women over the nineteenth century, and the fact that pregnancy vomiting was encountered within professional settings indicates that some women requested treatment.[96] Lewis notes that '[p]renatal care was welcomed as part of the larger effort to secure healthy reproduction, even from the earliest weeks of pregnancy'; a point that Patricia Branca labels a 'declining sense of fatalism'.[97] Lewis also suggests that husbands were consumers for gynaecological care, no longer willing to tolerate their wives' suffering they may have encouraged them to seek treatment.[98] Nevertheless, that obstetrics and gynaecology were part of the nineteenth-century medical marketplace would automatically have placed restrictions on a number of women, with only some wealthier families able to afford their services, and others who may have preferred the family's physician.[99]

It was respite from the distress of nausea and vomiting that primarily appears to have been sought. Describing this discomfort, Mary Drew wrote in 1889 that: 'I eat now all right, in spite of the sickness wh[ich] is greatest morning and evening. But the minute I have eaten I repent as I feel perfectly stuffed up to the throat.'[100] Therefore, '[n]atural or

[96] Moscucci, *The Science of Woman*.
[97] Lewis, *In the Family Way*, p. 129 and Branca P., *Silent Sisterhood: Middle Class Women in the Victorian Home* (London: Croom Helm, 1975), pp. 62-4.
[98] Lewis, *In the Family Way*, p. 2.
[99] Oakley, *The Captured Womb*, p. 28.
[100] Mary Drew to Lavinia Talbot, 12th August 1889, Mary [Gladstone] Drew Papers, BL Add. MS. 16236, fos. 300-1, cited in Jalland and Hooper, *Women from Birth to Death*, p. 134.

not, beneficial or not, most women wanted relief from morning sickness – whether palliative or cure,' according to Lewis.[101]

Morning sickness does appear in hospital in-patient records in the late nineteenth century.[102] In the records of St Bartholomew's Hospital, for instance, the condition was classified amongst diseases connected with pregnancy and parturition, and labelled variously as 'vomiting of pregnancy', 'vomiting in pregnancy' and 'pregnancy vomiting'.[103] St Bartholomew's and St Thomas's were admitting pregnant women seeking respite from vomiting at varying rates; generally one case was admitted every few years, though occasionally multiple cases in one year.[104] An increasing number of cases were reported in St Thomas's Hospital following the introduction of a report specifically for the Department for Diseases of Women in 1888.[105] The majority of these women were classified as 'cured' or 'relieved'. As mentioned earlier, rest and purgatives were recommended treatments for the condition. The reports also note that, whilst they would not necessarily survive the ordeal, women were sometimes cured of pregnancy vomiting as a result of spontaneous abortion.[106] However, only rarely is a patient recorded as dying from pregnancy vomiting. A pregnant woman admitted to St

[101] Lewis, *In the Family Way*, p. 140.
[102] It would be reasonable to claim that there were more women being treated for morning sickness as out-patients during this period, in higher numbers than those admitted for whom we have records. Also, a note on terminology: although pregnancy vomiting was often categorised within 'diseases' of pregnancy or the genital system, taken in conjunction with other sources I argue that this was merely for the function of classification. I do not believe that the condition was considered a disease, but was merely labelled in this manner for the purpose of most efficiently recording statistics.
[103] In the early twentieth century this was changed in the hospital reports to 'pregnancy complicated by vomiting'. See Morley Fletcher H., Drysdale J.H. and Baily R.C., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1903', *Saint Bartholomew's Hospital Reports* (1905) **40**, p. 29. In *St Thomas's Hospital Reports* morning sickness was labelled as 'vomiting of pregnancy' and 'vomiting during pregnancy', and was classified within diseases of the genital system. See Hadden W.B., 'Medical Report. 1882', *Saint Thomas's Hospital Reports* (1882) **12**, p. 251 and Hadden W.B., 'Medical Report. 1887', *Saint Thomas's Hospital Reports* (1887) **17**, p. 246.
[104] For an example of a 'busy' year see West S. and Bowlby A.A., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1885', *Saint Bartholomew's Hospital Reports* (1886) **22**, p. 25.
[105] For example: Cullingworth C.J., 'Report of the In-Patient Department for Diseases of Women for the Year 1890', *Saint Thomas's Hospital Reports* (1892) **20**, p. 438; Cullingworth C.J., 'Report of the In-Patient Department for Diseases of Women for the Year 1891', *Saint Thomas's Hospital Reports* (1893) **21**, p. 491; Tate W.W.H., 'Report of the In-Patient Department for Diseases of Women for the Year 1896', *Saint Thomas's Hospital Reports* (1897) **25**, p. 414; Stabb, 'Department for Diseases of Women for the Year 1897', p. 410.
[106] By which was meant miscarriage, as we would commonly use the term today, as opposed to an abortion procured to relieve sickness. See Hadden, 'Medical Report. 1886', p. 294. There was also a case in 1890 in which the patient aborted, but died afterwards. Ormerod and Bowlby, 'St. Bartholomew's Hospital during 1890', pp. 38-9.

Thomas's in 1886, for instance, died from exhaustion, but for others either no explanation was found for the woman's death or it was not stated within the reports.[107]

Advice Books and Home Remedies

Although cases of morning sickness appear in hospital reports, it is likely that these would have presented only when nausea and vomiting were severe; indeed, in an 1868 review of hospital practice it was noted that 'in the great majority of cases the opinion of the physician is not sought.'[108] Dr Greenhalgh (d.1887) of St Bartholomew's Hospital complained that this was due to women's ignorance of their own health, and argued that 'many failures are doubtless attributable to neglect on the part of the patient, who, under the impression that it is a necessary part of the pregnant state and must consequently be borne, does not apply for relief.'

This argument was also reversed, with failure being seen on the part of medical practitioners. Branca suggests that despite women's need for relief and their anticipations for medical intervention, this did not always materialise.[109] Perhaps for this reason John Epps (1805-69) wrote of pregnancy vomiting in his mid nineteenth-century domestic advice text, that

> the inefficacy of the means used has led medical men to recommend their patients to consider it as *a thing that must be*, and that they *must wait till the quickening*: just as they call all complaints, for which they know no medicines, *nervous*, forgetting that a nervous affection *is* a complaint, is a *disease*, and being a deviation from the natural order, called health, consequently admits of cure.[110]

Epps, a well known homeopathic physician, was suggesting here that allopathic doctors maintained that pregnancy vomiting was 'safe' in order to rationalise their lack of treatment for it, or to justify their 'sanguine attitude' towards it.[111]

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[107] Hadden, 'Medical Report. 1886', p. 294 (death from exhaustion). Other cases ending fatally: Ormerod and Bowlby, 'St. Bartholomew's Hospital during 1890', pp. 38-9; Calvert J., Garrod A.E. and Berry J., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1897', *Saint Bartholomew's Hospital Reports* (1899) **34**, p. 28.
[108] 'Hospital Out-Patient Practice', p. 255.
[109] Branca, *Silent Sisterhood*, pp. 62-4.
[110] Epps, *Domestic Homœpathy*, pp. 189-90.
[111] Lewis, *In the Family Way*, p. 140.

Rather than consult a medical professional many women sought help in advice literature. Numerous health manuals written by doctors offered rules on simple 'care', such as diet, exercise and life-style. In addition to strong coffee or plain foods before rising, numerous concoctions were recommended: bicarbonate of potash, to be taken with water, and lemon juice as an effervescing draught.[112] Women's advice and domestic homeopathy texts also recommended the use of ipecacuanha and nux vomica in the home; 'given to a person in *health* [an emetic] produces morning sickness, nausea, vomiting, and heartburn. Hence, its efficacy.'[113]

It is also likely that women turned to popular patent remedies for their cure. In the 1830s and 1840s various versions of 'Harvey's Restorative Cordial' were advertised for 'the morning sickness of females,' as well as '[a]ll those debilitated by luxurious living, late hours, vexation, intense study, or confinement to business, [who] will find this Cordial their best friend.'[114] In the late nineteenth century the *ILN* carried adverts for 'Dunn's Pure Fruit Saline', which was sold solely for the relief of morning sickness.[115] Many patent remedies, however, were also aimed at calming the nerves, rebalancing the constitution or providing something easily digestible by the stomach.[116]

Whilst advice literature was available, there is, of course, little direct evidence on the extent to which it was used, although the number of reprinted editions indicates high demand.[117] Pamphlets and books may have been an alternative for women who could not afford obstetrician's fees, although their services were predominantly aimed at the new middle classes.[118] Jalland suggests that for medical advice most women 'usually

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[112] Kesteven W.B., *A Manual of Domestic Medicine* (London: Longman, Brown, Green, and Longmans, 1856), p. 234; Chavasse, *Advice to a Wife*, p. 75.
[113] Quote from Epps, *Domestic Homœpathy*, p. 190. See also Norton, *Homeopathic Family Medicine*, p. 84 and Mears, *The Pupil of Nature*, p. 76.
[114] 'Harvey's Restorative Cordial – Advertisements & Notices', *Jackson's Oxford Journal* (7th May 1836) and 'Harvey's Restorative Cordial – Advertisements & Notices', *Manchester Times and Gazette* (13th May 1837).
[115] 'Multiple Classified Advertising Items', *Illustrated London News* (22nd August 1891), p. 262.
[116] 'Dr King's Dandelion and Quinine Bilious and Liver Pills – Advertisements & Notices', *Caledonian Mercury* (17th August 1861); 'Koumiss – Advertisements & Notices', *Graphic* (13th March 1880); 'Dr. J. Collis Browne's Chlorodyne – Advertisement', *Time* (November 1882), p. 963. For secondary literature on commodity culture and patent medicine at this stage see Richards T., *The Commodity Culture of Victorian England: Advertising and Spectacle, 1851-1914* (California: Stanford University Press, 1990), pp. 168-203.
[117] Pye Henry Chavasse's *Advice to a Wife*, William Buchan's *Domestic Medicine*, and Thomas Bull's *Hints to Mothers*, all ran in to numerous editions. For more on the use of manuals and the practice of reprinting see St Clair W., *The Reading Nation in the Romantic Period* (Cambridge: Cambridge University Press, 2004), particularly pp. 177-210, and Mechling, 'Advice to Historians'.
[118] Branca, *Silent Sisterhood*, pp. 65-6. Lewis has found evidence of their use by the aristocracy. See Lewis J.S., 'Maternal Health in the English Aristocracy: Myths and Realities, 1790-1840', *JSH* (1983)

consulted married sisters and close female friends, but they relied most of all on their mothers for moral support, advice and reassurance.'[119] Mrs Villiers, for example, recommended a combination of cayenne pepper and laudanum to Lady Morley.[120]

The extent to which the condition was considered a problem requiring intervention would have depended not only on the availability of remedies, but also on the woman's ability to assume the sick role in the first place. Lewis notes that some women did refrain from social activities during the early months of their pregnancy because 'they were apt to be suffering from nausea, dizziness, and vomiting', and furthermore this would have been their decision as opposed to their physician's.[121] Emma Darwin, for instance, requested that her husband take over her writing tasks whilst she was ill.[122] In most situations, however, it would have been impossible for a working-class woman to avoid her duties due to morning sickness.[123]

Furthermore, some women did not feel their experience of pregnancy vomiting was one of illness at all. Margaret McDonald (née Gladstone) in fact described herself as 'on the whole exceedingly well', although she had suffered from 'prolonged sickness day and night for three months'.[124] Similarly, 'despite morning sickness in the early months', Jalland writes, 'Edith Lyttleton, Mary Harcourt and Margaret McDonald all considered themselves "extremely well"', perhaps the joy and pride at the prospect of becoming a mother carried sufferers through the ordeal. Therefore pregnancy vomiting, regardless of the availability of intervention methods, remained an individualised encounter with sickness, and one that practitioners offered no systematised explanation of, or response to, themselves admitting that women rarely sought their help.

17:1, p. 108. Jalland, however, disputes that there is evidence to say they were used. See Jalland, *Women, Marriage and Politics*, p. 141.

[119] Jalland, *Women, Marriage and Politics*, p. 141. For more on the centrality of the mother/daughter relationship in women's health care and decisions see Smith L.S., 'Reassessing the Role of the Family: Women's Medical Care in Eighteenth-Century England', *SHM* (2003) **16:3**, pp. 327-42.

[120] Lewis, *In the Family Way*, pp. 140-1.

[121] Lewis, *In the Family Way*, p. 127.

[122] *Darwin Correspondence* (letter no. 1242).

[123] For a discussion of how women could have used their sick roles as a form of control within the household see Martineau H., *Life in the Sick-Room, Essays by an Invalid* (London: E. Moxon, 1844).

[124] Jalland, *Women, Marriage and Politics*, p. 138.

Constitution and Susceptibility

Doctors believed that sickness, although common, was not an inevitable accompaniment to pregnancy.[125] As nausea and vomiting followed no specific pattern of progression, they did, at times, question why there was such a spectrum of severity. Why did some women suffer more and what excited episodes of sickness? The irritated reflex actions previously described were reported by obstetricians to have been brought on by a variety of causes, such as 'bad smells, peculiar odours, shocks, frights, and indigestible food.'[126] In his Lumleian Lectures in 1873 Barnes, a leading obstetrician of the day, argued that vomiting could be bought on at the moment of conception in 'subjects [who] are generally "nervous," susceptible to emotional and physical impressions'.[127] Causes like these were also known to trigger nervous diseases such as hysteria, to which women were said to be particularly susceptible. Indeed, there was a clear 'nervous' factor associated with pregnancy vomiting, which was linked to the notion of a female 'delicacy of constitution'.[128]

From the 1850s Bull and Montgomery authored advice manuals that warned readers that the popular prejudice – 'a pregnant woman, having two to feed, ought to swallow a double supple of nutrition' – contributed to sickness.[129] Yet a multiplicity of other health and lifestyle factors were also considered as explanations, such as those expressed in the popular *Letters to a Mother* (1848) written by man-midwife John Conquest (1799-1866). 'Although pregnancy is a natural alteration,' Conquest wrote, 'in consequence of the artificial and unnatural method of rearing females from birth, it does occasion, sooner or later, in most women, many distressing complaints, which evidently depend on pregnancy as a cause.'[130] His point was that if women deviated in any way from the natural mode of living, they would likely suffer. This was not solely a

[125] Montgomery, *An Exposition of the Signs and Symptoms*, p. 49; Churchill, *On the Diseases of Women*, p. 526; Bull, *Hints to Mothers*, p. 59.
[126] Churchill, *On the Diseases of Women*, p. 532; Blundell, *The Principles and Practice of Obstetricy*, p. 187; Campbell W., *Introduction to the Study and Practice of Midwifery, and the Diseases of Women and Children* (London: A. and C. Black, 1833), p. 520.
[127] Barnes, 'Lumleian Lectures', p. 551.
[128] Beecher C.E., *Physiology and Calisthenics for Schools and Families* (New York: 1856), p. 164, cited in Douglas Wood, 'Women's Complaints and their Treatment', p. 26.
[129] Quote from Montgomery, *An Exposition of the Signs and Symptoms*, p. 25. Bull held the same view; see Jalland and Hooper, *Women from Birth to Death*, p. 132. In the early modern period it was also considered as a result of too much, or bad, food. See Gélis, *History of Childbirth*, p. 82 and Eshleman, 'Diet during Pregnancy', p. 31.
[130] Conquest J.T., *Letters to a Mother, on the Management of Herself and her Children in Health and Disease* (London: Longman & Co., 1848), p. 24.

male medical perspective. The gynaecologist Mary Scharlieb (1845-1930) echoed these views in *A Woman's Words to Women* (1895), writing that 'the physiological course of these states [of pregnancy] borders on the pathological, and in women living under the artificial conditions of civilised life the dividing line is readily transgressed.'[131]

Women's increased susceptibility was most commonly expressed in the language of nerves. Greenhalgh reported in 1868 that pregnancy vomiting was caused in the early stages of pregnancy by a mode of sympathy, and if later in the pregnancy by mechanical pressure of the uterus upon the stomach.[132] This vomiting was most common and potentially severe, Greenhalgh wrote:

> in those of a nervous or hysterical temperament; in those who have suffered from dysmenorrhoea and other uterine ailments; in those in whom the mammary sympathies are well marked; in primiparæ; in twin gestation; and more frequently amongst the rich than the poor, owing probably to the more highly attuned state of the nervous system, and less active occupation of mind in the former.[133]

Tying a hysterical element to pregnancy vomiting corresponded to the development of ideas in the new specialism of gastroenterology, where a psychosomatic element to many conditions was accepted.[134] The view that envisaged nausea and vomiting as afflicting women of a nervous temperament was also in line with nineteenth-century concepts of 'diseases of civilisation', and was a continuation of eighteenth-century conceptions of nervous irritability and sensibility.[135] In 1860 Inman agreed that vomiting in pregnancy was primarily caused by uterine sympathy and the 'formation of a new being', however he argued that 'neither the one nor the other hold sufficiently prominent a place to give to them the most important rank, inasmuch as neither one nor other produces the sickness, unless other conditions are present.'[136] In his experience the condition seemed not to affect healthy, strong women, leading Inman to suppose

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[131] Scharlieb M., *A Woman's Words to Women on the Care of their Health in England and in India* (London: Swan Sonnenschein, 1895), p. 85.
[132] 'Hospital Out-Patient Practice', p. 255. See also Lever, 'On Some Disorders of the Nervous System', p. 2.
[133] 'Hospital Out-Patient Practice', p. 255.
[134] Ackerknecht E.H., *Therapeutics: From the Primitives to the 20th Century* (New York: Hafner Press, 1973), p. 133.
[135] Barker-Benfield G.J., *The Culture of Sensibility: Sex and Society in Eighteenth-Century Britain* (Chicago: University of Chicago Press, 1992). Women with increased sensibility were though to be more susceptible to illness.
[136] Inman, 'On Morning Sickness', p. 223.

that it must be the result of some 'deficiency of vital power in the brain, and in the stomach.' This view was in keeping with general nineteenth-century understandings of women's essential periodicity.[137] The upper classes in particular were often said to be most susceptible to reproductive illness, indeed many practitioners suggested that the refined and rich suffered more from pregnancy vomiting than the poor, possibly as a result of their smaller pelvises.[138] In contrast, animals did not suffer pregnancy vomiting as a result of their lack of civilisation.[139] Vomiting could therefore intensify a pre-existing debility, to which women were prone.

These findings correlate more with the history of a culture of sensibility, or diseases of civilisation, than they do with notions of a 'biological straitjacket' and justifications for women's subordination. If anything, nausea and vomiting were said to be merely encouraged by frailty, and were not used as evidence that women's bodies or roles ought to be restricted as a result of pregnancy. Furthermore, whilst scientific rationales were used to explain the physiological cause of nausea and vomiting, this did not function to frame the condition as negative or in need of specialist intervention. Rather, women continued to perceive morning sickness traditionally, and the majority of practitioners saw no need for a therapeutic response – aided by the general acceptance that nausea and vomiting were notably difficult symptoms to relieve or control – unless the condition presented in an *abnormally* severe manner.

4.5 *Hyperemesis Gravidarum*

Comparative Sickness

In discussing the concept of restoration of health alongside changing therapeutic practice between 1820 and 1880, John Harley Warner in the *Therapeutic Perspective* recognises that the use of the term *normal* had almost entirely replaced *natural* by the mid 1870s as the state therapies aimed to return the body to.[140] According to Warner's

[137] Oppenheim J., '*Shattered Nerves': Doctors, Patients and Depression in Victorian England* (New York and Oxford: Oxford University Press, 1991), p. 188; Digby, *Making a Medical Living*, pp. 276-8; Frawley M.H., *Invalidism and Identity in Nineteenth-Century Britain* (Chicago and London: University of Chicago Press, 2004).
[138] Lewis argues that Victorian obstetricians asserted upper-class women suffered much more from poorer reproductive health than the general population. See Lewis, 'Maternal Health', p. 99.
[139] See 'Hospital Out-Patient Practice', p. 255 and Martin, *Hyperemesis Gravidarum*, p. 29.
[140] Warner J.H., *The Therapeutic Perspective: Medical Practice, Knowledge, and Identity in America, 1820-1885* (Cambridge and London: Harvard University Press, 1986), pp. 85-91.

premise the dominant assumption for therapeutic practices in the earlier period was based on an 'excessive excitement or enfeeblement', which was tackled by modifying the system back to that individual's natural balance. By the mid nineteenth century, however, the concept of systemic alterations from a natural condition was replaced by more complex, discrete and measureable deviations from often quite specific, normal functioning. Quantified norms were formulated based on clinical observation and via the use of measurements and equipment; each person was then assessed and compared with the healthy norm. Such a shift can be observed in the history of pregnancy vomiting, the *natural* operation of which was considered useful and healthy. Although this continued to be a popular opinion, the recognition that there was a spectrum of severity introduced the notions of a 'normal' (or 'ordinary') and 'abnormal' experience of pregnancy vomiting.[141]

Throughout the nineteenth century there was a firm belief amongst male medical practitioners, of which Barnes and Tyler-Smith were typical, that a 'woman's biological functions blur[red] into disease.'[142] Although normally harmless, pregnancy vomiting had the potential to become 'abnormal' or unmanageable, thus falling directly into the medical man's remit as a pathological condition.[143] This shift can be exemplified in the case of Charlotte Brontë (1816-55). Brontë died, reportedly, after having experienced perpetual nausea and faintness, indigestion and extreme weakness, followed eventually by a 'low wandering delirium.'[144] Although her death certificate recorded that she died from phthisis, discussions in the 1970 *Brontë Society Transactions* speculated that she may have died of what came to be known as *Hyperemesis Gravidarum*, the severe or obstinate vomiting of pregnancy.[145] The symptoms of this condition were: almost

[141] One of the earliest uses of the word normal, or in fact, 'abnormal' was in Churchill, *On the Diseases of Women*, p. 531 and referred to the abnormality of obstinate vomiting during pregnancy. Hewitt uses the term 'ordinary' to describe morning sickness. See Hewitt G., *The Diagnosis, Pathology and Treatment of Diseases of Women, Including the Diagnosis of Pregnancy*, 1st American from the 2nd London edn (Philadelphia: Lindsay & Blakiston, 1868), p. 401.
[142] Moscucci, *The Science of Woman*, p. 102.
[143] For example see Tyler-Smith, 'Lectures on Parturition', p. 277 and Churchill, *On the Diseases of Women*, p. 526.
[144] Dally A., *Inventing Motherhood: The Consequences of an Ideal* (London: Burnett Books Ltd., 1982), p. 34.
[145] Dally, *Inventing Motherhood*, p. 34. Dally writes that this is asserted by many doctors who have read Mrs. Gaskell and it was discussed by Philip Rhodes, a professor of obstetrics. See Rhodes P., 'A Medical Appraisal of the Brontës', *Brontë Society Transactions* (1972) **16:2**, pp. 101-9. More recent discussions have suggested that tuberculosis with secondary Addison's disease can better explain her signs and symptoms. See Weiss G., 'The Death of Charlotte Brontë', *Obstetrics & Gynecology* (1991) **78:4**, pp. 705-7.

incessant vomiting, wasting and debility, fainting brought on by movement or mental emotion, a marked change in features, fever, and acidity of breath.[146]

References to obstinate pregnancy vomiting appear throughout the century, although without necessarily being referred to by a specific name.[147] Montgomery's description is representative of early to mid nineteenth-century attitudes towards the condition:

> it is not to be forgotten, that occasionally the natural sympathetic affections may become excessive, and be very injurious, or even destructive of life, as, for instance, when total exhaustion and death have resulted from incessant vomiting, or when the violence of that act has caused the rupture of internal organs, as the uterus or the liver.[148]

Severe vomiting was thus thought to be an 'excessive' sympathy, or 'manifestation of hyperesthesia of the gastric nerves', meaning that it was an extreme version of the normal response to the irritation caused by the physiologically-changing uterus.[149] It could refer to violent vomiting in the early stages of pregnancy, when morning sickness was to be expected. Alternatively, severe vomiting was also that which occurred in the later months of pregnancy, beyond the usual period of sickness. Charles Clay (1801-93), a gynaecological surgeon labeled by his contemporaries as the 'Father of Ovariotomy', was at pains to make this distinction. He was convinced '[t]hat these cases differ from, and must not be confounded with, those of nausea and sickness of the early months, however severe'.[150] Other commentators on the condition were far less clear on this distinction, and severe or obstinate vomiting was the generic name given to any harmful sickness suffered as a result of pregnancy.

Radical Intervention

The severe vomiting of pregnancy was principally characterised by its potential to emaciate the mother and ultimately cause her death. The treatments available were the

[146] Churchill, *On the Diseases of Women*, p. 541; Barnes, 'Lumleian Lectures', p. 551; Tanner, *On the Signs and Diseases*, p. 383.
[147] Blundell referred to it rather as 'cases of extreme emaciation'. See Blundell, *The Principles and Practice of Obstetricy*, p. 182. Other practitioners referred to it as 'life-threatening' or 'unending'.
[148] Montgomery, *An Exposition of the Signs and Symptoms*, p. 52 and Blundell, 'Lectures on the Gravid Uterus' (1829), p. 417.
[149] Hannotte Vernon H., 'The Physiology, Pathology, and Therapeutics of the Motor Functions of the Uterus', *BMJ* (1st August 1857), p. 640.
[150] 'Obituary. Charles Clay', *BMJ* (23rd September 1893), p. 712; Clay C., *On the Severe and Obstinate Forms of Vomiting during the Latter Months of Pregnancy* (London: Longman, Brown, Green, Longmans, and Roberts), p. 7. The year this pamphlet was published is unknown, although it was post-1856.

same as those offered for the alleviation of everyday vomiting, in addition to those employed for the purpose of counteracting extreme emaciation. This meant finding ways to allow the mother to receive adequate nutrition.[151] Even after 1850 Clay recommended the use of leeches, locally applied with the use of a speculum to the *os* and *cervix uteri*.[152] The severest cases, however, were managed by premature induction of labour, or abortion; of course, in an era when neonatal care was cursory, there may have been little difference between the two interventions. The earliest reference I found to abortion was in 1794. A discussion of its morality in very sick pregnant women took place amongst medical men in London, which concluded in its favour.[153] Although mostly employed for conditions other than pregnancy vomiting, such as puerperal convulsions, rapidly progressive varicosity of veins, ovarian tumours and distorted pelvis, discussion of its use continued periodically throughout the nineteenth century.[154] Such interventions were justified because as a rule, Hanson writes, the mother's life was considered primary to the baby's.[155]

Induction of labour was a choice made in only the most serious of cases. In 1860 the obstetrician Thomas Hawkes Tanner (1821-74) cautioned that

> this plan of treatment must not be resorted to without a consultation with another practitioner; the necessity of destroying the product of conception, in order to save the mother's life, should be fairly and fully

[151] One method was injection of nutrients directly into the bowels. See Blundell, *The Principles and Practice of Obstetricy*, p. 180.
[152] Clay, *On the Severe and Obstinate Forms of Vomiting*, pp. 6-8.
[153] Denman T., *An Introduction to the Practice of Midwifery*, vol. 2 (London: J. Johnson, 1794), p. 215. For the history of induction of premature labour see Herbert Barker T., 'Excerpts from Daily Practice', *BMJ* (1st October 1859), p. 793; Godson C., 'The Induction of Premature Labour', *Saint Bartholomew's Hospital Reports* (1875) **11**, pp. 29-39; Keown J., *Abortion, Doctors and the Law: Some Aspects of the Legal Regulation of Abortion in England from 1803 to 1982* (Cambridge: Cambridge University Press, 1988), pp. 63-9; Loudon I., *Death in Childbirth: An International Study of Maternal Care and Maternal Morality 1800-1950* (Oxford: Clarendon Press, 1992), pp. 133-4.
[154] See for example Churchill, *On the Diseases of Women*, p. 536; Lazarewitch J., 'Induction of Premature Labour by Injection to the Fundus of the Uterus', *Transactions of the Obstetrical Society of London* (1868) **4**, p. 171. Also see the 1894 discussions in the *Lancet*: 'Obstetric Medicine and Gynaecology. The Induction of Premature Labour', *Lancet* (4th August 1894), p. 293; Barnes R., 'The Indications for the Induction of Premature Labour', *Lancet* (11th August 1894), pp. 314-16; 'Obstetric Medicine and Gynaecology', *Lancet* (11th August 1894), pp. 355-8; Merriman, 'Cases of Premature Labour Artificially Induced', pp. 139-40.
[155] Hanson, *Cultural History of Pregnancy*, p. 8. A possible avenue for further research is the history of the use of severe morning sickness as an excuse for the procurement of abortion. For provisional reading see Imber J.B., *Trusting Doctors: The Decline of Moral Authority in American Medicine* (Princeton & Oxford: Princeton University Press, 2008), pp. 22-42

> explained to the husband or relatives before resorting to the necessary steps.[156]

Neither was the decision necessarily one made by the doctor. Clay reports a case in which he treated Mrs. M., who had spontaneously aborted on five previous occasions. When the patient began exhibiting 'alarming symptoms' during the seventh month of pregnancy, Clay believed that induction of labour would have cured her condition entirely. 'Still,' Clay wrote, 'the earnestly expressed desire of both parents induced me to persevere a little longer: the operation was, therefore, deferred.'[157] It was when Clay finally resorted to induction of labour that, during the process of carrying out the operation, he discovered extreme tenderness of the *os* and *cervix uteri*, to which he attributed the severe vomiting, and upon which he built his own theory of the condition.

Whilst the everyday vomiting of pregnancy rarely led to hospitalisation, severe vomiting of pregnancy evidently did. Tanner noted that '[n]umerous fatal cases are recorded; but I know of no author who has had the misfortune to meet with so many as Baron Dubois', who had come across twenty cases in thirteen years.[158] As I demonstrated earlier in this chapter, St Bartholomew's and St Thomas's both dealt with in-patients that ended in fatalities.[159] The first reference in St Bartholomew's Hospital Reports to a woman being admitted for 'Hyperemesis' does not come until 1908, although the condition was named and recognised many years previously.[160] While information such as this does not reveal the incidence of the condition, it does suggest that the medical profession saw multiple cases and some fatalities.[161] A hospital setting presented physicians with the occasion to develop standardised and physiologically-based understandings of the condition. Moreover, the potential risks of the illness allowed doctors the opportunity to examine women's bodies, and in the later years of the nineteenth century women increasingly permitted the use of the speculum.

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[156] Tanner, *On the Signs and Diseases*, p. 392.
[157] Clay, *On the Severe and Obstinate Forms of Vomiting*, p. 5.
[158] Tanner, *On the Signs and Diseases*, p. 383-4. Tanner was instrumental in the foundation of the Obstetrical Society and held several posts specialising in gynaecology.
[159] See Hadden, 'Medical Report. 1886', p. 294; Ormerod and Bowlby, 'St. Bartholomew's Hospital during 1890', pp. 38-9; Calvert, Garrod and Berry, 'St. Bartholomew's Hospital during 1897', p. 28.
[160] Horder T.J., Landon Brown W., Etherington Smith R.B. and Elmslie R.G., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1908', *Saint Bartholomew's Hospital Reports* (1910) **45**, p. 37.
[161] In a study of mortality on the Isle of Man two cases of death from vomiting of pregnancy were registered, the first in the period 1897-1901 (p. 166), the second 1922-26 (p. 169). See Pantin C.G., 'A Study of Maternal Mortality and Midwifery on the Isle of Man, 1882 to 1961', *Medical History* (1996) **40**, pp. 141-72. For fatal cases see also Herbert Barker, 'Excerpts from Daily Practice', p. 793 and Horrocks P., 'Severe Vomiting in Pregnancy: Miscarriage: Death, With Remarks', *BMJ* (4th July 1885), pp. 13-14.

Obstetrician James Henry Bennet claimed that he had personally endorsed use of the speculum to observe dilation of the vagina during cases of obstinate vomiting as early as 1864, despite pathologists in Parisian hospitals regarding it as dangerous and likely to cause an abortion.[162] Autopsies were another source of evidence for physiological conditions corresponding to severe vomiting of pregnancy, allowing for the comparison of multiple cases.[163]

Nausea and Vomiting as Symptoms of Abnormality

Doctors' experiences with severe pregnancy vomiting were a topic of discussion in the letters and commentaries sections of journals. A handful of obstetricians emerged in the 1870s as key commentators on the condition. These were Thomas Tanner, Edward Copeman (1809-80) and Graily Hewitt (1828-93).[164] An exchange involving the latter pair was printed in the *BMJ* in 1875 and encouraged others to voice their opinions. Such exchanges allowed obstetricians to construct a more standardised prognosis and etiology of this condition. These discussions included establishing a boundary, specifying the nature of the disease by distinguishing it from the regular vomiting of pregnancy, and isolating a causal explanation in an abnormality, rather than merely pregnancy itself.

In an 1875 article entitled 'A Novel Treatment of Obstinate Vomiting of Pregnancy', Copeman claimed to have cured three women having 'discovered by accident as it were', that dilation of the *os uteri* relieved vomiting. Copeman published case histories with his successful treatment.[165] Hewitt tried to explain the *modus operandi* of this treatment, and confirmed that it supported his own previous work on the subject: Hewitt's opinion – that an acute degree of anteversion of the uterus during pregnancy

[162] Henry Bennet J., 'On Obstinate Sickness during Pregnancy', *BMJ* (12th June 1875), p. 769. According to his obituary Henry Bennet 'did excellent work and fought a vigorous and successful battle for what was in his time the novel use of the vaginal speculum'. See 'Obituary. James Henry Bennet', *BMJ* (12th September 1891), p. 620.
[163] Much of Hewitt's work was based on autopsies. Hewitt G., *On Severe Vomiting During Pregnancy: A Collection and Analysis of Cases with Remarks on Treatment* (London: Longmans, Green, and Co., 1890).
[164] Copeman was vice-president of the British Medical Association and a fellow of the Obstetrical Society of London with a particular interest in rare and extraordinary midwifery cases; see 'Obituary. Edward Copeman', *BMJ* (6th March 1880), p. 382. Graily Hewitt was an eminent gynaecologist and Chair of Midwifery for twenty-two years at University College London; see 'Obituary. William Morse Graily Hewitt', *BMJ* (9th September 1893), p. 585.
[165] Copeman E., 'A Novel Treatment of Obstinate Vomiting in Pregnancy', *BMJ* (15th May 1875), p. 638. The *os uteri*, or external *os*, is an aperture on the vaginal portion of the cervix.

caused excessive vomiting – was demonstrated, he believed, when Copeman had accidentally altered the position of the uterus, thus relieving tension.[166] The influence of Copeman's theory was noted at his death in 1880, with his obituary stating that his work had been translated into French and his methods practised in Berlin, Paris, America and Turin.[167] Numerous doctors had presented their opinions on the subject in medical journals, however. Moreover, the number of obstetricians engaging with the condition rose following a lecture given by Hewitt to the Obstetrical Society in 1884.[168] One of the central facets of this debate was to consider the differentiation between vomiting *of* pregnancy, and vomiting *in* pregnancy, focussing on the idea that such severe vomiting must be caused by a condition other than the growing foetus.[169]

In his 1884 lecture, Hewitt discussed the possible influence of morbid conditions of the uterus on severe pregnancy vomiting, anticipating much of what was to later be published in his monograph. His argument was that severe vomiting was a symptom of a dysfunction or abnormality, commonly of the uterus. The majority of commentators on his lecture supported Hewitt's conclusions, though many felt that further evidence was needed on the conditions' variations in severity and therefore associated causes. A few members of the audience disagreed entirely, some arguing that irritation of the uterus could not be the sole cause; others argued that the response was different only in degree to ordinary pregnancy vomiting.[170]

In 1890 Hewitt published his investigations in a monograph entitled *Severe Vomiting during Pregnancy* which summarised the findings and debates of earlier years, with additional details of 116 cases. The cases, drawn from various authors, were divided by Hewitt into two types:

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[166] Hewitt G., 'On Dr. Copeman's Novel Treatment of Obstinate Vomiting in Pregnancy', *BMJ* (29th May 1875), p. 702. An anteverted uterus tips forwards towards the bladder, as opposed to a retroverted uterus which tilts backwards towards the spine.
[167] 'Obituary. Edward Copeman', p. 382. Copeman's ideas were not universally accepted, however. For example, J.S. Greene argued that his ideas were neither original nor correct. See Greene J.S., 'The Vomiting of Pregnancy and its Treatment', *Lancet* (15th June 1878), p. 886.
[168] See Bennet, 'On Obstinate Sickness', p. 769; Copeman E., 'Treatment of Obstinate Vomiting in Pregnancy', *BMJ* (12th June 1875), p. 769; Copeman E., 'The Treatment of Sickness from Uterine Irritation', *BMJ* (5th February 1876), p. 160; Copeman E., 'On the Treatment of Severe Vomiting in Pregnancy', *BMJ* (28th September 1878), pp. 460-1; Matthews Duncan J. and Collins W.J., 'Pernicious Vomiting of Pregnancy', *Saint Bartholomew's Hospital Reports* (1883) **19**, pp. 121-6; Routh A., 'The "Uncontrollable" Vomiting of Pregnancy', *BMJ* (6th June 1891), p. 1259.
[169] Horrocks, 'Severe Vomiting in Pregnancy'; Hewitt, *On Severe Vomiting During Pregnancy*, pp. 4-5.
[170] 'Obstetrical Society of London', *Lancet* (20th December 1884), pp. 1098-100 and Jones, 'The Vomiting of Pregnancy'.

> 1. Those in which the vomiting is due to some disease or condition quite distinct from the pregnancy. The vomiting which occurs under these circumstances is independent of the pregnancy, although it is possible that it may be intensified by it: Vomiting *in* pregnancy.
>
> 2. Those in which the vomiting is produced by, or dependent directly upon, the pregnancy: Vomiting *of* pregnancy.[171]

Hewitt concluded that severe vomiting was not only dependent on pregnancy, but more specifically an abnormal physiological-anatomical response to it. He set out his ideas with substantially more evidence than had previously been offered. The majority of his cases were classed as being characterised by an anteverted, retroverted, flexed or anteflexed uterus. There were fewer cases where inflammation or rigidity of the *os uteri* was said to be a factor. He advocated, therefore, treatments involving mechanical reduction of the malposition of the uterus, application of pessaries, or artificial abortion, all to be supplemented by rest and occasional caustics.

Hewitt's theory dominated medical literature on severe pregnancy vomiting for the following two decades. In 1905 it was recognised by the *Journal of Obstetrics and Gynaecology* as the 'theory most favoured by earlier writers, and one which no doubt even now carries weight with it.'[172] His explanations were also supported by Martin's *Hyperemesis Gravidarum, with Reference to its Etiology and Treatment*. Published in 1892, this thesis is noteworthy for its 'scientific' nomenclature. The author suggested that changes in the position of the uterus increased the intensity of ordinary reflex symptoms and were, consequentially, pathological conditions.[173] The framing of *Hyperemesis Gravidarum*, distinguished with systematised, technical-medical language and labelled as both abnormal and resting wholly within the medical sphere, resulted in the regular vomiting of pregnancy being considered normal, or ordinary, respectively.

[171] Hewitt, *On Severe Vomiting During Pregnancy*, pp. 4-5. Case studies listed include those attended by: Anquetin, Dubois, Chomel, Sandras, Trousseau, Harrinson, Matthews Duncan, Horwitz, William Tyler-Smith and Edward Copeman.
[172] Stevens T.G., 'Critical Review: Hyperemesis Gravidarum', *Journal of Obstetrics and Gynaecology* (1905) **7:4**, p. 267.
[173] Martin, *Hyperemesis Gravidarum*, p. 28.

4.6 Conclusion

The account of morning sickness set out in this chapter challenges histories of pregnancy which stress that the nineteenth century saw the pathologising of motherhood and the increasing application of medical rationales as a means of controlling and restricting women during this time. In fairness, most historical literature in the genre has focussed on the fraught experience of childbirth and ignored pregnancy as such, but a wider implication was clear in historical discussions of gynaecology. I have demonstrated how notions of women's essential nervousness and inclinations towards fragility and hysteria were understood to influence the severity of morning sickness, rather than be caused by it. Claims that morning sickness was pathological, or disease-like, were few and far between, and such assertions gained no hold in medical theory or practice.

The idea that nineteenth-century pregnant women were considered to be essentially unwell is further questioned in the light of sickness being seen as the body's positive and healthy response to new life. Physiological understandings of nausea and vomiting during pregnancy were co-constructed by both medical professionals drawing on the 'objective' value of science, in addition to women's own knowledge of their bodies and minds; medical and lay spheres exchanged their ideas and beliefs regarding this condition. I have shown that nausea and vomiting during pregnancy were often perceived as positive and healthy, even when discussions entered medical realms; it was thus not a medical condition *per se*. Morning sickness therefore helps us to understand the natural-normal issue in practice, and thus forces us to reconsider traditional notions of medicalisation. Although there was little tension regarding who should be responsible for the condition – it remained within lay authority – I have also revealed how the everyday relationship between doctors and pregnant women changed amongst those who could and did choose to consult for an early pregnancy condition, such as morning sickness, during this period.

While I have shown that Oakley's claim that the complete 'redefinition of pregnancy to abolish any idea of its essential normality was an obstetrical necessity,' is mistaken, can it be argued that my final discussion of *Hyperemesis Gravidarum* supports the

medicalisation of pregnancy in the nineteenth century?[174] I would say not, rather it was the exception that proves the rule. The establishment of *Hyperemesis Gravidarum* as a systematised and distinct disease category, with a standardised set of symptoms, physiological explanation and associated treatments, defined an abnormality in need of intervention. It arose in marked contrast to the ordinary vomiting of pregnancy, consequently reinforcing the dominant narrative that these symptoms were normal and necessary physiological functions.

My account of morning sickness further demonstrates the difficulties nineteenth-century doctors had generally in explaining and treating nausea and vomiting, as discussed in Chapters Two and Three. In 1887 the *BMJ* published an obstetric memorandum which declared that '[m]any theories have been adduced regarding the cause of morning sickness during pregnancy. All, however, appear to have been too speculative, and no one has met with anything like universal sufferance.'[175] Indeed, although understandings were 'speculative', dominant frameworks of medical theory and practice were applied to the everyday condition of pregnancy vomiting. Explanations shifted from humoral and anatomical in the early nineteenth century, to physiological and nervous-reflex understandings in the mid to late nineteenth century. There were also continuities, and ideas and practices were cumulative. Responses to pregnancy vomiting, as nausea and vomiting more generally, were similarly entrenched in traditional remedies.

This chapter also demonstrates the need for historians of medicine to pay attention to episodes of 'minor' illness, which were and are, of course, the predominant experience of illness and disease. Pregnancy vomiting is revealing of the many conditions where people were 'sick' and did not call upon medical assistance, rather tolerating the incapacity, choosing self-help, or relying on family and friends. Moreover, many women did not experience nausea and vomiting as an illness, seeing it rather as a necessary, or normal, adjustment to being with child. By looking at nausea and vomiting through the lens of pregnancy I have brought to the fore the nature of these conditions as being cultural as much as medical, and individualised rather than systematised. In the next chapter I continue in this thread, and look more closely at

[174] Oakley, *The Captured Womb*, p. 2; Lawrence C., *Medicine in the Making of Modern Britain, 1700-1920* (London and New York: Routledge, 1994), p. 45.
[175] Oliver, 'The Cause of Morning Sickness', p. 717.

cultural experiences of nausea and vomiting, how they were not necessarily pathological occurrences, and how their perception was shaped by the situation in which they presented.

CHAPTER FIVE:
SEA-SICKNESS

5.1 Introduction

On 30th December 1831, the third day after the *Beagle* set sail from Plymouth bound for the Galapagos Islands, Charles Darwin wrote in his diary:

> At noon Lat. 43, South of Cape Finisterre & across the famous Bay of Biscay: wretchedly out of spirits & very sick. I often said before starting, that I had no doubt I should frequently repent of the whole undertaking, little did I think with what fervour I should do so. I can scarcely conceive any more miserable state, than when such dark & gloomy thoughts are haunting the mind as have today pursued me.[1]

The following three days 'were ones of great & unceasing suffering' and culminated with Darwin nearly fainting from exhaustion.[2] Darwin was not alone in suffering severely from nausea and vomiting at sea; nineteenth-century literature on sea-sickness is undeniably extensive. It is also unusually balanced from a historical perspective, being weighted neither on the side of medical practitioner nor sufferer, giving a rare, rich insight into experiences of these conditions. Nausea and vomiting in the form of sea-sickness were experienced in a variety of ship-settings throughout the nineteenth century, from convict transports, emigrant ships, whalers and leisure travel. Sailors and passengers aboard each consistently encountered sea-sickness, every form of travel presenting a unique set of problems and remedial regimens.

Nausea and vomiting at sea, though extremely common and usually temporary, brought mental distress and physical fatigue to the sufferer. I therefore begin my analysis with an exploration of experiences. Using journals, letters, diaries and newspapers I show that sea-sickness is engrained in the cultural history of health at sea.[3] I question how encounters with these symptoms shaped experiences of work and travel, and how sufferers were portrayed in popular media. Following this, I turn to an investigation of

[1] Keynes R.D. (ed.), *Charles Darwin's Beagle Diary* (Cambridge: Cambridge University Press, 2001), p. 18.
[2] Keynes, *Charles Darwin's Beagle Diary*, p. 18.
[3] The *ILN* was the first illustrated weekly newspaper published from 1842 onwards and frequently referred to scientific and social views of sea-sickness; this source therefore features prominently in this chapter.

how nausea and vomiting were managed on board ships. By considering preventive and remedial methods, I explore how the causes of this illness were perceived. I also investigate how individual experiences and common practices were communicated in the wider public sphere, meaning that sea-sickness was not a condition solely under medical authority.

At the core of this chapter lies the question of authority and responsibility, and how these shaped constructions of sea-sickness as an illness. Having considered practices on board ship, in the last two sections I explore how responsibility spread from individuals to a much wider social-space in the form of technological developments and naval architecture as a means to combat the condition. I particularly focus on the public and medical interest in the development of an anti-sea-sickness project – the Bessemer Saloon – from the late 1860s. Although an unmitigated failure in the eyes of the media, the Bessemer Saloon represented the extent to which nausea and vomiting affected sea-travel.

In the final section, whilst reflecting on the interaction of public and professional knowledge regarding sea-sickness, I consider how nausea and vomiting were approached at the margins of professional practice and the increasingly negative response from medical professionals towards lay experimentation and self-medication. I also explore how the spatial separation of nausea and vomiting at sea from a standardised medical authority in hospitals and laboratories created a distinct lag in the adoption of dominant medical theories and practices. This chapter therefore specifically questions how experiences and perceptions of nausea and vomiting were shaped by their position in both personal-health issues and as symptoms within the realm of medical knowledge.

This chapter differs slightly from those preceding it by only adopting a broadly-chronological framework following the first section. Experiences of nausea and vomiting at sea underwent no significant change through the course of the nineteenth century. Rather, meanings and sufferings were remarkably consistent, despite variance according to the type of voyage being undertaken. These experiences are therefore dealt with thematically first, to provide a basis for understanding the wide-scale social, medical and technological intervention and interest throughout the century.

5.2 Experiences

Misery, Repulsion and Shame

In the previous chapter the varied meanings of nausea and vomiting as signs and products of bodily changes were explored. Socio-cultural limitations on the open discussion of morning sickness, however, meant that little could be said of how these signs and symptoms were actually experienced. Sea-sickness stands in stark contrast to this; its occurrence was extensively and colourfully described. Its appearance was considered a normal part of a journey, and was often expected.

Nausea and vomiting at sea were reported as stimulating fierce emotional reactions in sufferers. An anonymously written article of 1872 published in *All the Year Round*, a Victorian literary magazine founded and owned by the novelist Charles Dickens, proclaimed:

> How ill, not a few of us know; so ill that this illness makes us forget every other suffering and every danger. The moral and the physical prostration are equally complete. Far from fearing death, we are indifferent to it, wish for it, even pray for it. "Oh do throw me into the sea, and drown me!" is not a rare entreaty to escape from despairing victims' lips.[4]

In a similar fashion Darwin most frequently related sea-sickness to the feeling of 'misery'. During the most severe attacks aboard the *Beagle* he found it difficult to tolerate, complaining 'that nothing, not even geology itself can make up for the misery & vexation of spirit'.[5] Often referred to as an 'evil', its predominance and ability to induce fear and apprehension amongst the travelling population is clear; the morale of its sufferers would undoubtedly have been deeply affected.[6]

Physically, impact on appetite was one of the clearest ways in which nausea and vomiting affected a sea voyage. In *Punch's Prize Novelists* (1853), William Makepeace

[4] Quote from 'Sea-Sickness', *All the Year Round* (1872) **8**, pp. 342-6. See also 'The End of Season', *ILN* (5th September 1856), p. 151.
[5] Darwin to Darwin C.S., 10th March 1835. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry271/ (letter no. 271; accessed 17th November 2011).
[6] Danvers H., 'Sea-Sickness', *Lancet* (11th June 1892), p. 1295.

Thackeray (1811-63) depicted The Fat Contributor aboard the paddle wheel steamer *Lady Mary Wood*, as suffering greatly from sea-sickness:

> Why is it I cannot eat my victuals? Why is it that when Steward brought to my couch a plateful of Sea-Pie (I called wildly for it, having read of the dish in maritime novels), why is it that the onions of which that delectable condiment seems to be mainly composed, caused a convulsive shudder to pass from my nose through my whole agonised frame, obliging me to sink back gasping in the crib, and to forego all food for many, many hours?[7]

The Fat Contributor was eventually 'obliged to plunge back to the little cabin again, and have not been heard of since. Since then I have been lying on my back, sadly munching biscuit and looking at the glimmer of the sun through the deadlight overhead.'[8]

Sea-sickness restricted many passengers to their berths: 'Sunday was very rough & Monday saw but little of us landlubbers upstairs,' wrote one emigrant passenger in 1859.[9] Yet nausea and vomiting were not easily kept private. The respected physician Dominic John Corrigan (1802-80) described a rough night on his journey to Athens in 1861. When the ship pitched 'clear above came the almost unceasing sounds of sea-sickness and hiccups from one of the ladies' cabins'.[10] Of course not every sufferer felt the need to keep their symptoms secret. Darwin frequently discussed his sea-sickness, convinced that 'if it were not for sea-sickness the whole world would be sailors'.[11] Neither was it for his satisfaction alone. In a letter to his father, Robert Waring Darwin (1766-1848) in 1832, Darwin wrote: 'In the Bay of Biscay there was a long & continued swell & the misery I endured from sea-sickness is far far beyond what I ever guessed

[7] Thackeray W.M., *Punch's Prize Novelists: The Fat Contributor, and Travels in London* (New York: D. Appleton and Company, 1853), pp. 151-2. *Punch's Prize Novelists* was a series of illustrated burlesque parodies of Thackeray's contemporary writers.
[8] Thackeray, *Punch's Prize Novelists*, pp. 152-3.
[9] Entry dated 28th March 1859, HT Passage Narratives, DX/1727, Mersey Maritime Museum Archives. 'Landlubber' was a cultural term occasionally used to describe people unfamiliar or uncomfortable with the sea. See 'Literature', *ILN* (17th November 1860), p. 458. In the whaling business landlubbers were men from hamlets and farms near the whaling ports who, if they survived their first voyage, would gradually become whalers in their own right. See Stamp T. and Stamp C., *Greenland Voyager* (Whitby: Caedmon of Whitby, 1985), p. 12.
[10] Corrigan D.J., *Ten Days in Athens: With Notes by the Way: Summer of 1861* (London: Longman, Green, Longman, and Roberts, 1862), p. 46.
[11] Darwin to Darwin R.W., 8th and 26th February and 1st March 1832. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry158/ (letter no. 158; accessed 17th November 2011).

at.— I believe you are curious about it. I will give all my dear-bought experience.'[12] Darwin's fixation with chronicling his sickness was evidently encouraged by his father's curiosity.

Inquisitiveness about nausea and vomiting was not universal, however. So prevalent were descriptions of sea-sickness that in 1874 a reviewer for the *ILN* criticised the comic writer Francis Cowley Burnand's (1836-1917) reading of his 'Happy Thoughts' during the Christmas festivities, saying that 'we could have dispensed with the incident of the sea-sickness, which has been so frequently described that it presents no novelty to counterweight its unpleasantness.'[13] The *ILN* had certainly published frequently on sea-sickness, in both literary and scientific formats, though many literary pieces also assumed that their readers had experience of sea-sickness, as one author wrote: 'further to insist on its delightfulness would be supererogatory.'[14]

In an 1873 review of a new work by an author named Amelia Perrier the reviewer readily accepted that sea-sickness was a 'well-worn theme' in literature, though Perrier's attention to the condition was notably extensive.[15] In her experience of *A Winter in Morocco* (1873), Perrier described the 'repulsive' nature of sea-sickness. Aboard the steamer *Wolf*, Perrier reports having quickly become 'a figurehead' to the ship, for the self-confessed reasons that: 'my nostrils are undesirably sensitive to unpleasant smells, and I am unfortunately prone to sea-sickness'.[16] During the journey the ship was caught in bad weather, and trapped in what the Captain called a 'boil', where conflicting currents met. As soon as the ship started to pitch and roll Perrier had been sick, which was followed by a feeling of guilt for her earlier criticisms of the state of the decks.[17] With her head very close to a fellow passenger as they tried to hold safely to the ship, Perrier described the situation:

> He had glowered fiercely and furiously at me when I got sick. Now he was groaning and gurgling in a manner frightfully indicative of approaching sea-sickness in himself; and I could not but be conscious

[12] *Darwin Correspondence* (letter no. 158). See also Darwin S.E. to Darwin, 12th May 1832. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry170/ (letter no. 170; accessed 17th November 2011).
[13] 'Christmas Entertainments', *ILN* (3rd January 1874), p. 18.
[14] '"Scene on Board a French Steamer from Havre to Honfleur." Painted by M. Biard', *ILN* (19th September 1863), p. 294.
[15] 'New Books', *ILN* (1st November 1873), p. 422.
[16] Perrier A., *A Winter in Morocco* (London: H.S. King, 1873), p. 52.
[17] Perrier, *A Winter in Morocco*, p. 57.

> that from the respective position of our heads, if he were to become so, it would be exceedingly unpleasant for me; and the feeling in no way added to the comfort of my situation.[18]

That the environment on ships could quickly become repulsive is unsurprising. Lancelot Armstrong, surgeon and superintendant to the convict ship *Daphne*, noted in 1819 that the decks during the voyage to New South Wales were wet and filthy as a result of the men's sea-sickness.[19] Although not as restricted as convicts, emigrants' comfort was also compromised. Herman Melville, a sailor aboard an emigrant ship heading from Liverpool to New York in 1849, described what happened when poor weather was first encountered: 'From under the two hatches came the steady drum of a subterranean wailing and weeping.'[20] Similarly, in his history of emigrants Terry Coleman records that:

> The emigrants had nowhere but their berths to be sick, and in almost all emigrant ships, and in all those of any size, the berths were set up in two or three tiers, each tier holding four people. Those below were the least fortunate. Afterwards, the passengers could not be induced or bullied to clear up, even if the crew was diligent enough to try to make them.[21]

The author of an article in the *Public Health Papers and Reports* (1880) reminded readers that 'for most of the [Emigrant] voyage the steerage is a hospital filled with sea-sick people.'[22] This occurrence was depicted in Figure 9, shown below, in which is portrayed a cabin on board a packet-boat.[23]

[18] Perrier, *A Winter in Morocco*, p. 58.
[19] 29th May 1819, Folio 4, Medical and surgical journal for convict ship Daphne, ADM 101/19/1/1, TNA.
[20] Coleman T., *Passage to America: A History of Emigrants from Great Britain and Ireland to America in the Mid Nineteenth Century* (London: Hutchinson and Co., 1972), p. 20.
[21] Coleman, *Passage to America*, p. 20.
[22] Turner T.J., 'The Hygiene of Emigrant Ships', *Public Health Papers and Reports* (1880) **6**, p. 34. The steerage refers to the lowest decks.
[23] A packet-boat was a small boat designed for domestic mail, passenger and freight transportation. They ran regular services for much of the eighteenth and nineteenth centuries.

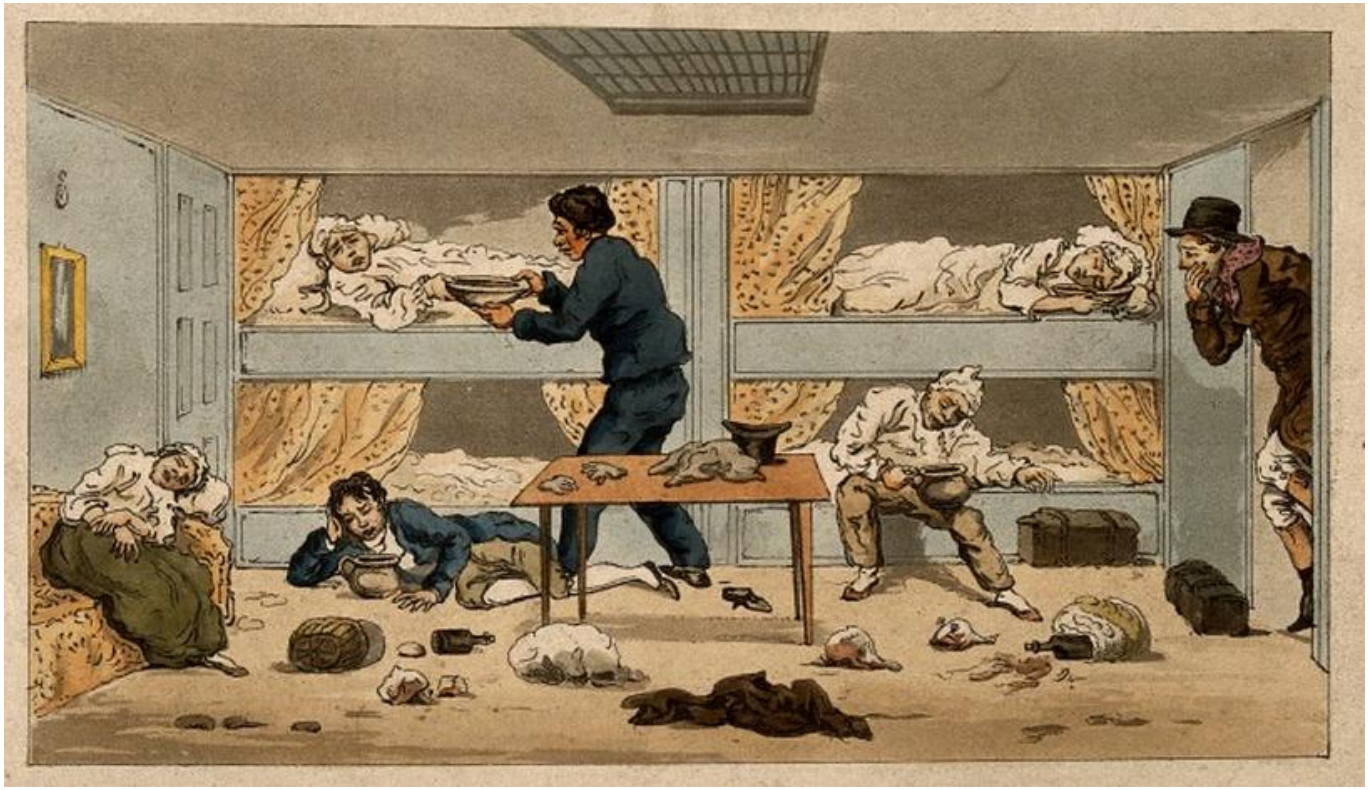

Figure 9. ‘The Interior of a Packet’. A cabin on board a packet-boat, its occupants either asleep or being sea-sick (London: Published by the Proprietor, 1814)

Source: Wellcome Library, London

Despite the frequency with which sea-sickness was evidently experienced, and the ease with which some individuals discussed it, the condition was often accompanied by embarrassment. Dickens wrote an account in his travel diary of his trip to North America in 1842, entitled 'American Notes', which included a 'humiliating description of the horrors of sea-sickness'.[24] Even Darwin recognised the shame he was expected to feel. Writing in 1833 to his sister Susan Elizabeth Darwin (1803-66), he explained: 'I am writing this on shore; and what do you think is the reason? – Proh Pudor [*for shame*] – Sea sickness'.[25] A sufferer's actions could often betray their embarrassment. The narrator of a cruise taken in the Fera Islands during the summer of 1854 noted that on their second day from the Scottish coast, whilst 'the two boys, who had both been at sea before in other vessels, actually paid their tribute to the deep', that '[o]ne poor fellow seemed very much ashamed of his weakness, and pretended to be merely looking over the side'.[26] 'A half accumulated tear-drop in each eye,' the author continued, 'betrayed him unmistakeably to a practised observer.'[27]

Depictions, Satire and Gender

Sufferers' embarrassment was not always met with sympathy. An article published in the *ILN* in the early twentieth century, but which aptly summed up nineteenth-century views, included the following description:

> Of all the maladies to which human flesh is liable, there is surely none more distressing or more enervating in its effect than that which our neighbours describe as mal-de-mer. Yet, oddly enough, there is none also which appears to excite less sympathy, as a rule, or is more often used as a vehicle for banter and raillery. Why it should be so is by no means clear, for those who are immune bear but a small proportion to the numbers liable to the tortures of this most levelling ailment.[28]

[24] 'Literature', *ILN* (26th November 1853), p. 450.
[25] Darwin to Darwin S.E., 3rd December 1833. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry233/ (letter no. 233; accessed 17th November 2011).
[26] Rathbone S. and Greig E.H., *A Narrative of the Cruise of the Yacht Maria among the Fera Islands in the Summer of 1854* (London: Longman, Brown, Green, and Longmans, 1855), p. 7.
[27] Rathbone and Greig, *A Narrative of the Cruise*, p. 7.
[28] An Old Sailor, 'Sea Sickness: Its Prevention', *ILN* (26th October 1907), p. 1.

This could be a challenge to the 'British manner', which according to the unnamed author of an article in *The Times*, printed in 1860, was not generally sympathetic to sea-sickness sufferers.[29]

The condition was depicted in a variety of nineteenth-century engravings, etchings and lithographs. These took on both serious and satirical tones but were often a source of amusement. A few examples are shown over the following pages. The first, Figure 10, is an engraving of a painting that was on exhibition in Paris in 1863, and portrays a French Steamer, painted by François-Auguste Biard (1798-1882). According to the *ILN*, who printed this version, it illustrated 'with such singular gusto and irresistible humour' the condition of sea-sickness.[30]

Figure 11 shows the manner in which sea-sickness was used in a political sketch. The lithograph shows John George Lambton (1792-1840), Lord Durham, the Governor-General of the British Provinces in North American, sitting beside Edward Ellice (1810-80), his private secretary. Thomas Turton (1790-1854), his legal advisor, vomits over the side. The rough voyage from Canada to England was thought to signify the treatment given to Durham for his handling of Canadian affairs in Parliament.[31]

The final image of the set, Figure 12, shows the reproduction of a nineteenth-century engraving that employed a play on words for comic effect. The facial expression of the sea-sickness sufferer also adequately illustrates the emotions that have been discussed.

[29] 'Sea Sickness', *The Times* (21st June 1860), p. 6; 'Scientific Results of the Month', *ILN* (13th June 1874), p. 571.
[30] '"Scene on Board a French Steamer"', p. 294, image p. 285.
[31] *An Illustrated Key to the Political Sketches of H.B.* (London, 1841), pp. 377-8, as referenced in the Wellcome catalogue.

Figure 10. 'Scene on board a French steamer from Havre to Honfleur'

Source: '"Scene on Board a French Steamer from Havre to Honfleur." Painted by M. Biard', *ILN* (19th September 1863), p. 294.

Figure 11. ‘A black north-east-er and a heavy swell, on the Atlantic. A situation in which human titles and dignities do not appear to the best advantage’. Caption reads ‘I think we had better go below’. Coloured lithograph by John Doyle (London: T. McLean, 1838).

Source: Wellcome Library, London.

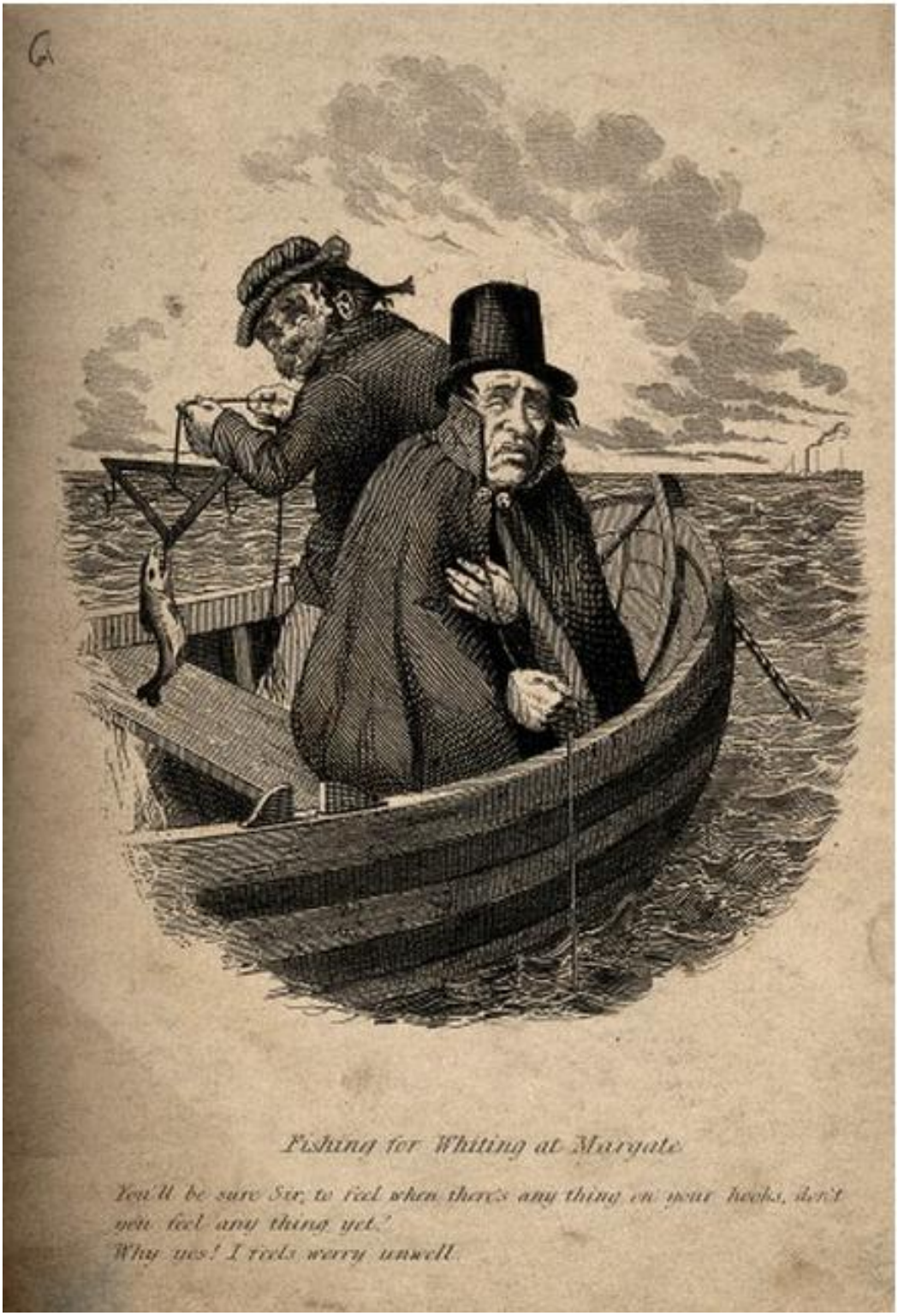

Figure 12. 'Fishing for whiting at Margate'. Two men at sea in a fishing boat: one leans over the side, feeling sea-sick. Caption reads 'You'll be sure to feel when there's any thing on your hooks, don't you feel anything yet? Why yes! I feel very unwell.' Reproduction of a nineteenth-century engraving.

Source: Wellcome Library, London

In addition to being the subject of comedy and mockery, sea-sickness sufferers were at times judged as weak. In 1895 the young King of Spain, Alfonso XIII (1886-1941), was praised for not being sea-sick, whilst his governess was reported to have shown herself as 'an inferior mortal' when she succumbed.[32] Yet this notion of weakness certainly did not dominate. For sufferers it was some consolation that even famous naval characters fell victim to sickness: 'when it is known as a fact that a NELSON was always ill on first going to sea, need a Fat Contributor be ashamed of a manly and natural weakness?'[33] In this chapter, however, little emphasis has been placed on the connection of gender and sea-sickness. In the nineteenth century nausea and vomiting at sea were predominantly seen to affect anyone and everyone, regardless of their sex. From the experiences described, men were just as likely to suffer as women. For example, the surgeon aboard the convict ship *Captain Cook* from 1831-2, bound for New South Wales, noted that many of the prisoners suffered severely when the ship entered the Tropics, most cases being older men.[34] Even trained naval men were at risk. Darwin, in 1831, wrote that '[m]ore than half the naval officers feel uncomfortable at first starting.'[35] The extent to which men, and sailors in particular, suffered, is demonstrated further in section 5.4.

Narratives which suggested that women suffered more than men do exist, though they are few and far between in the wide array of nineteenth-century literature on the topic. For example, in 1866 an emigrating policeman named Edward Allchurch (1828-1917) wrote in his diary that the women and children had suffered particularly badly, even when the boat was moored. His wife, Anne Allchurch, suffered severely during the first week at anchor.[36] Joan Druett claims that 'Petticoat Whalers', or whalers' wives, often suffered from sea-sickness to such extents that they had to be put off-ship, or have the ship alter course. However, according to Druett's study, their lengthier recoveries from sickness in comparison to the men on board was likely a result of their 'lack of fresh air and activity'.[37] It was also seen as a result of their travelling less, therefore not growing

[32] 'Personal', *ILN* (14th September 1895), p. 326.
[33] Thackeray, *Punch's Prize Novelists*, p. 155.
[34] 28th October 1831-15th April 1832, Folios 29-30, Medical journal for the convict ship Captain Cook, ADM 101/16/1/2, TNA.
[35] Darwin to Darwin C.S., 12th November 1831. *Darwin Correspondence Project Database* http://www.darwinproject.ac.uk/entry146/ (letter no. 146; accessed 17th November 2011).
[36] Haines R., 'Medical Superintendence and Child Health on Government-Assisted Voyages to South Australia in the Nineteenth Century', *Health and History* (2001) **3:2**, p. 4.
[37] Druett J., *Petticoat Whalers: Whaling Wives at Sea, 1820-1920* (Auckland: Collins, 1991), p. 47; Currie S., *Thar She Blows: American Whaling in the Nineteenth Century* (Minneapolis: Lerner Publications, 2001), pp. 71-2.

accustomed to the movements of the ship.[38] Florence Fenwick-Miller (1854-1935), a pioneering female journalist and public lecturer, noted the high number of women who were ill on the short voyage between Newhaven and Dieppe, and so wrote to the *ILN* to share her remedy – the use of cocaine.[39] Fenwick-Miller, in her 'Ladies' Column', recommended it be used in either fluid form or in lozenges, which were more practical to carry, but had a sickly-sweet flavour. However, Fenwick-Miller, in writing for a female audience, may have asserted that women were prone to sickness in order to promote her remedy.

Temporary Nature and Variations in Severity

Sea-sickness was characterised as being the most 'miserable' illness, but only while it lasted.[40] Normally, nausea and vomiting at sea were temporary symptoms. Thackeray's description of The Fat Contributor emphasised how swiftly the condition could come and go: 'He is exhausted; he is melancholy; he is desperate; he rejects his victuals; he grows hungry, but dares not eat; he mends; his spirits rise; all his faculties are restored to him; and he eats with redoubled vigour.'[41] Nineteenth-century commentators often believed that nausea and vomiting would abate when individuals gained their 'sea-legs'. It was commonly thought that in calm weather sea-sickness would subside within a week or ten days, perhaps even as little as four or five.[42] Susan Patterson, for example, was sea-sick for the first week of her voyage to Auckland in 1855, her husband suffering only when the weather was rough.[43] Likewise, the politician William Clive Bridgeman (1864-1935) wrote to his father from the *R.M.S Doric* in 1892, telling him that he had suffered only an initial bout of sea-sickness, but had since recovered.[44] The respected physician James Alderson (1794-1882) attributed this transient nature of the

[38] Stocker J.R., 'Sea-Sickness', in Allbutt T.C. (ed.), *A System of Medicine by Many Writers*, vol. 3 (London: Macmillan and Co., 1897), p. 445.
[39] Fenwick-Miller F., 'The Ladies' Column', *ILN* (22nd August 1891), p. 260.
[40] '"Scene on Board a French Steamer"', p. 294.
[41] Thackeray, *Punch's Prize Novelists*, p. 157.
[42] 'Emigrating to Australia', *ILN* (12th February 1887), p. 190; Stocker, 'Sea-Sickness', p. 449. The surgeon for the *Great Britain* claimed it usually cleared after just the fourth of fifth day. Hocken T.M., 'Treatment of Sea-Sickness', *Lancet* (5th October 1861), p. 337.
[43] Letter from Susan and George Patterson, 5th June 1855, Letters Sent to George Ireland, Manager, Vulcan Foundry, 1828-1923, DX/603/7/1, H1 Emigration, Liverpool Museums, Merseyside Archives.
[44] Letter from Bridgeman to his father, dated 1st- 2nd November 1892, Records of the Bridgeman family, S.R.O. 4629/1/1892/58, Shropshire Archives.

illness to the sensorium's ability to adapt itself to unusual circumstances, though few medical authors offered justifications for this phenomenon.[45]

As would be expected the weather played a significant role in suffering and recovery times; even the 'most experienced seamen suffer on going to sea, after a stretch on the land, or rest on shore, in rough weather', wrote an anonymous correspondent to the *Lancet* in 1846.[46] The often stormy North Atlantic Westbound voyage was considered by emigrants a particularly bad journey for inducing sickness.[47] Furthermore, towards the end of the year, an author for the *ILN* wrote in 1861, 'people should begin to talk about the autumnal equinox, and the consequent increase of sea-sickness among returning tourists per South-Eastern Company's mail-packets between Dover and Calais.'[48] Attempts were made at the Royal Institution in the 1880s to understand the occurrence of sea-sickness quantitatively, according to changing weather patterns. As a result, people who regularly suffered from the condition were recommended to travel the Channel at night, which was usually the calmest part of the day.[49] Rough weather encouraged sea-sickness not least because it increased the movement of the ship, but also because it was unsafe for passengers to go on deck, meaning that the comfort of fresh air was not even available.[50]

Thackeray's Fat Contributor commented that '[i]t is astonishing how a few hours' calm can make one forget the long hours of weary bad weather. I can't fancy I have been ill at all, but for those melancholy observations scrawled feebly down in pencil in my journal yesterday.'[51] For many unlucky individuals, however, poor weather was not a necessity for sea-sickness. Allchurch commented that even without storms or gales battering the *Atlanta* on its voyage to South Australia, many were still ill.[52] Moreover, even if vomiting did abate, nausea could continue. According to the novelist, editor and regular contributor to the *ILN* on the topic of sea-sickness, James Payn (1830-98), there

[45] Alderson J., *Observations on Sea-Sickness, and on Some of the Means of Preventing It* (London: Hardwicke, 1872), p. 22.
[46] 'Sea-Sickness', *Lancet* (4th April 1846), p. 390.
[47] 'Maritime Archives & Library. Information Sheet 13. Emigration to USA and Canada' [http://www.liverpoolmuseums.org.uk/maritime/archive/pdf/Emigration-Emigration%20to%20USA%20and%20Canada%20no13.pdf; accessed 9th December 2011].
[48] 'Literature and Art', *ILN* (12th October 1861), p. 365.
[49] 'Royal Institution Lectures', *ILN* (8th May 1880), p. 447.
[50] Coleman, *Passage to America*, p. 19.
[51] Thackeray, *Punch's Prize Novelists*, p. 155.
[52] Haines, 'Medical Superintendence and Child Health', p.6.

was ‘a popular notion that after a day or two the nausea produced by pitching and tossing ceases; but as a matter of fact some people never get over it.’[53]

At times Darwin asserted that he was ‘becoming quite hardened’ by the duration and severity of his sea-sickness.[54] However, towards the end of his voyage aboard the *Beagle* he confessed: ‘I positively suffer more from sea sickness, now, than three years ago.’[55] Diaries recording experiences at sea often follow this pattern, whereby the sufferer believes they have recovered, only for sickness to return. For example, Arthur Richard Jones (1845-1935) from Birmingham travelled aboard the Cunard steam-ship *Samaria* from Liverpool to Boston in 1870, to visit his uncle. On the 3rd May he wrote that he was feeling sick but had a ‘tolerably good night’.[56] The next day he managed to eat ‘heartily’, ‘fast recovering I thought from seasickness’. On the 5th, however, he found himself suffering very badly from sickness, rising late and not being able to eat at all. By the following day, the 6th, he recorded: ‘Very rough today. Rose bout 8 o'clock but went to lie down again. Steamer pitched and rolled most horribly, so stayed in berth all day; most of passengers sick.’ Jones continued to report the transient nature of his illness; the ‘squeamishness’ came and went, and at times he thought it had gone completely, only to be followed by a bad night and the sickness returning. Consequently, he was ill all the way to Boston. On his return journey to Liverpool aboard the *Tripoli*, beginning in June 1871, the sickness came on again ‘in old style’. Despite the inconsistent nature of sea-sickness it was certainly liable to shape travel plans, such as those made by Jones. In a ‘Notebook’ entry of 1896, Payn discussed how detrimental sea-sickness was, even the shortest journeys meaning that people were reluctant to travel for leisure purely because of the illness they had to endure.[57]

The mental impact on sufferers is as evident as the physical response. Nineteenth-century literature and poetry often reflects on the beauty and wonder of seas and oceans; upon seeing the ocean ‘the poet expands into the philosopher; the manager, for the moment, is lost in the man.’[58] However, according to a man who had suffered ‘A Rough

[53] Payn J., ‘Our Note Book’, *ILN* (27th October 1894), p. 522.
[54] Darwin to Darwin C.S., 30th March-12th April 1833. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry203/ (letter no. 203; accessed 17th November 2011).
[55] Darwin to Darwin E.C., 3rd June 1836. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry302/ (letter no. 302; accessed 17th November 2011).
[56] Extracts from diary written by Arthur Richard Jones, Cunard Archives, D42/PR3/4/6a, Special Collections and Archives, University of Liverpool.
[57] Payn J., ‘Our Note Book’, *ILN* (30th May 1896), p. 678.
[58] ‘Literature’ (1853), p. 450.

Passage' in 1883, 'when poets, scholars, or philosophers are afflicted with the mal de mer, there is no supernatural belief too wild for their credence.'[59] Many of the popular sea fables, for example of mermaids, the sea monsters Leviathan and Kraken and serpent-like creatures such as the Hydra were, he claimed, 'possibly begotten of an agonised stomach and a gloomy imagination, under the influence of cruel sea-sickness'.

Occasionally suffering went further than temporary mental and physical exhaustion. In severe cases death was attributed to sea-sickness.[60] In 1844 *The Times* reported that a passenger had died aboard a steamer from Glasgow to Liverpool, following a gale during the passage.[61] Death could also be an indirect result of sea-sickness. For example, several passengers were reported to have drowned in their berths when rough seas broke into the hull of an emigrant ship, as they were too weak from illness to escape.[62] Compared to the large numbers of sea-sickness sufferers, however, the mortality rate was extremely low. In the *Dublin Journal of Medical Science* (1852), medical officer C.F. Moore wrote that he had 'read of fatal cases of sea-sickness as having occasionally occurred; but though I have seen some thousands of persons sea-sick, I have never witnessed a single fatal case.'[63]

It was easily believed that nausea and vomiting could result in morbid consequences, however. In Thomas Hardy's (1840-1928) *The Pursuit of the Well-Beloved*, first published in instalments in 1892, one man was affected so badly that his sickness aggravated a predisposing condition and caused haemorrhage.[64] In addition to physical strain, nausea and vomiting weakened constitutions. Sea-sickness, fatigue and anxiety were considered by the surgeon for the *Maitland* emigrant ship to 'predispose emigrants to disease'.[65] Moreover, in F.B. Smith's history of the *People's Health* he argues that the virulence of infectious diseases increased in under-nourished populations, and that deficiency disorders at sea significantly contributed to deaths. As an example, Catherine Baylies, a convict aboard *Mary* in 1823, was entered onto the sick-list by the ship's

[59] 'After a Rough Passage', *ILN* (13th October 1883), p. 363.
[60] 'Ireland', *ILN* (16th December 1848), p. 371; 'Latest Intelligence', *ILN* (7th May 1853), p. 343.
[61] 'Death from Sea Sickness', *The Times* (1st April 1844), p. 7.
[62] 'Dreadful Wreck of an Emigrant Ship', *ILN* (10th March 1845), p. 151.
[63] 'Critical Digest of the British and Foreign Medical Journals', *London Journal of Medicine* (July 1852), pp. 667-8.
[64] Hardy T., 'The Pursuit of the Well-Beloved', *ILN* (10th December 1892), p. 742; Hardy T., 'The Pursuit of the Well-Beloved', *ILN* (17th December 1892), p. 773.
[65] 1838, Medical journal of emigrant ship *Maitland*, ADM 101/78/1, TNA; September 1838, Report from John Smith re illness on board the *Maitland*, ADM 105/36, TNA cited in Foxhall K., 'Fever, Immigration and Quarantine in New South Wales', *SHM* (2011) **24:3**, p. 633.

surgeon as she had not eaten any solid food for five weeks.[66] If not encouraged by sea-sickness directly, the malnourishment that resulted from constant vomiting, such as this, would likely have left sufferers at higher risk of more threatening illnesses.[67] Moreover, in cases of pregnancy or new-born children, malnourishment could be similarly problematic. In Robin Haines's study of nineteenth-century voyages to South Australia he suggests that the inability of mothers to breast-feed, as a result of sea-sickness, may have played a significant role in the large number of infant deaths.[68]

5.3 Self-Medication and Experiments on Board

Remedial Regimens

There were three types of self-medication for sea-sickness: dietetic, patented medicines, and chemical formulations. As the consumption of food played a role in how much individuals suffered it was often combated in this way. While Darwin tried raisins, others stuck to tea and dry biscuits.[69] A light, bland diet was the favoured option. Combined with this, and in typical nineteenth-century fashion, alcohol was frequently the first port of call. Figure 13, below, illustrates the steps through which one sufferer, Tomkins, went. Due to a heavy swell the ladies went on shore to dine, but the men stayed on board. Tomkins, however, soon 'wished he hadn't'. The doctor 'persuaded him to try his infallible remedy for sea-sickness'. The 'immediate result' was Tomkins sat by the ship's railings, holding his head in his hands. Despite fashioning an extremely tight abdominal belt, his condition worsened. That night, seeing how poorly the situation had progressed, his friends intervened, throwing the remedy overboard. On returning to shore Tomkins was greeted by Mrs Brown who 'dosed him with the best cure of all': 'comforting liquor'. A day or two later Tomkins was able to return to his friends aboard ship 'with the complacent sensation of being able to rule the waves'.

[66] 12th April-3rd November 1823, Folio 26, Medical journal for the convict ship Mary, ADM 101/51/3, TNA.
[67] Smith F.B., *The People's Health 1830-1910* (London: Croom Helm, 1979), chapters 2-4, referenced in Staniforth M., 'Deficiency Disorder: Evidence of the Occurrence of Scurvy on Convict and Emigrant Ships to Australia 1837-1839', *The Great Circle* (1991) **13**, p. 119. Prisoners were often malnourished before they even embarked. See Foxhall K., 'From Convicts to Colonists: The Health of Prisoners and the Voyage to Australia, 1823-53', *The Journal of Imperial and Commonwealth History* (2011) **39:1**, p. 10.
[68] Haines, 'Medical Superintendence and Child Health', p. 17.
[69] *Darwin Correspondence* (letter no. 158).

Figure 13. 'Leaves from an Amateur Log'

Source: 'Leaves from an Amateur Log', *ILN* (13th August 1887), p. 190.

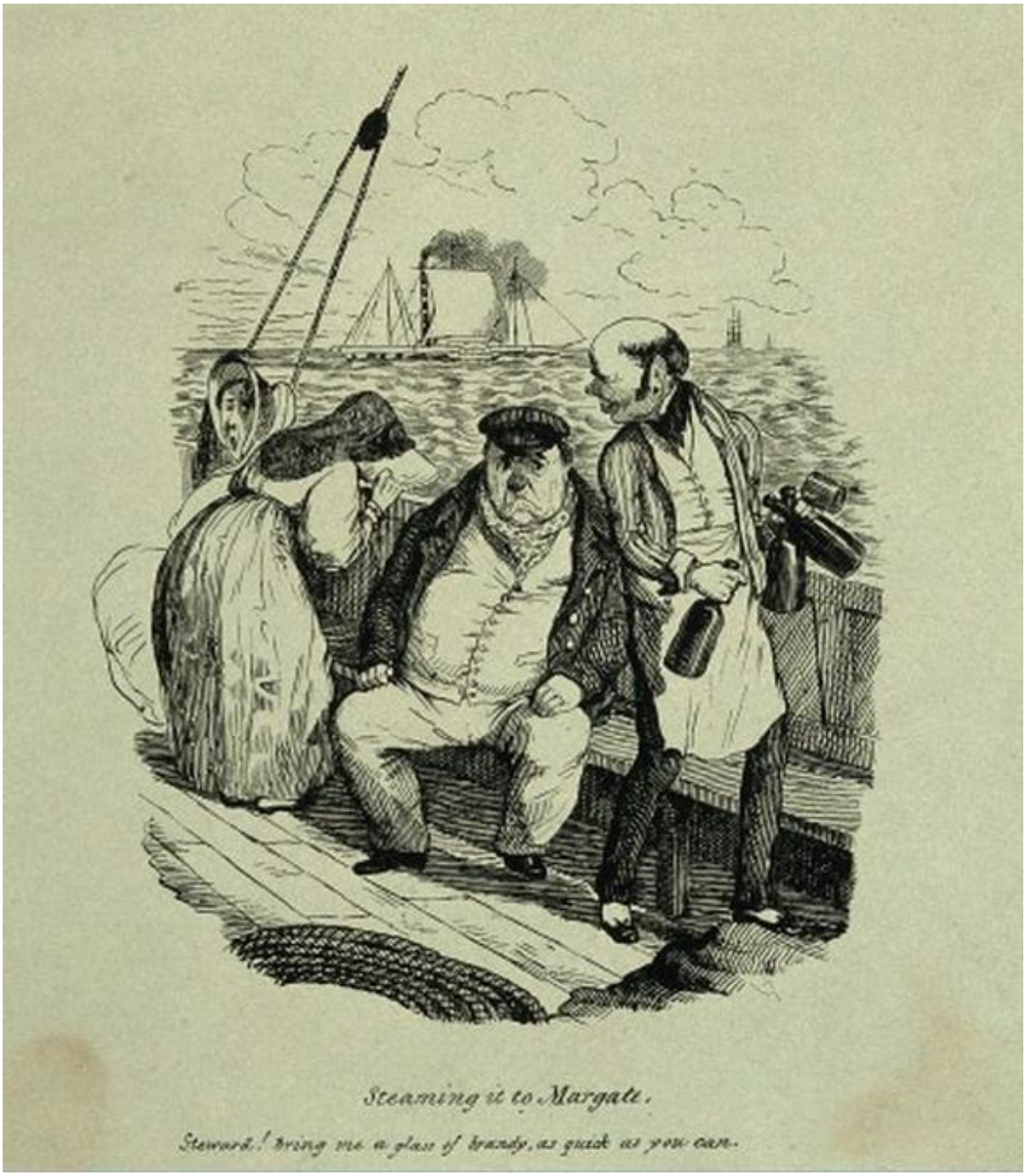

Figure 14. ‘Steaming it to Margate’. People suffering from sea-sickness on board a steam boat. Caption reads ‘Steward! Bring me a glass of brandy as quick as you can.’ Reproduction of a nineteenth-century etching after Robert Seymour (1870-1954).

Source: Wellcome Library, London

Brandy was a seemingly popular option, as illustrated by Figure 14, above. Dry champagne, sometimes iced, was also chosen to combat nausea and vomiting at sea, as it was considered able to revive energy and be retained in the stomach when everything else caused irritation.[70] According to Dr Andrew Wilson, who reported in the *ILN* on everyday and technical-scientific news in a column named 'Science Jottings', the reason for its success was its carbonic acid gas content.[71] It was also, according to the physician Ravenhill Pearce in 1857, 'easier and nicer to consume for ladies than brandy-and-water'.[72]

Sherry was often used to encourage the effect of medicines. Frederic Carpenter Skey (1798-1872), a surgeon at St Bartholomew's, recommended to the sea-cadet Henry Knight (b. 1848) that he use quinine – 'more efficient if given in port or sherry about 2 thirds of a glass.'[73] Likewise, on the 15th March 1818 Charles St George (1787-1864), aboard the *Eclipse* packet-boat, wrote to his mother:

> Till this morning early I was a most pitiable martyr to sea sickness & literally last night felt my inside falling so completely to pieces, that I had some thoughts of calling the Captain to make him order my Dispatches when the Steward he thought himself of some caudle sweetened & comforted with sherry, which so completely set me up that I performed my part at dinner today with exemplary perseverance & I am now come down from Deck.[74]

A caudle was a sweet, alcoholic drink given often in cases of illness. According to John King, a surgeon aboard a Nantucket whaler, he kept 'ether', a teaspoonful of which he mixed in wine for treating sea-sickness.[75] Indeed, alcohols would have formed part of a ship surgeon's medical chest.

There were also numerous patent remedies that passengers could choose from. An early nineteenth-century remedy was advertised in *The Times*: 'Willmott's Antalgia will be

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[70] Corrigan, *Ten Days in Athens*, p. 48; Beckwith E.L., 'Fermented Drinks', *ILN* (14th September 1867), p. 306.
[71] Wilson A., 'Science Jottings', *ILN* (1st November 1890), p. 566.
[72] Pearce R., 'Champagne in Sea-Sickness', *Lancet* (7th November 1857), p. 482.
[73] Note on seasickness signed by F.C. Skey, c. 1863, Letters received by Henry Knight, Knight Archives, 38M89/F121/1, Hampshire Record Office; 'Obituary. Frederic Carpenter Skey', *BMJ* (7th September 1872), pp. 282-3.
[74] Letter from Charles St George to his mother Melesina Trench, 15th March 1818, Austen-Leigh Family, 23M93/15/1/134, Hampshire Record Office.
[75] Druett J., *Rough Medicine: Surgeons at Sea in the Age of Sail* (New York: Routledge, 2000), p. 73.

found a complete prevention and remedy of sea-sickness. The ingredients are perfectly harmless but the combination is effectual to prevent nausea of the stomach', so the chemist claimed.[76] By the 1850s 'Parker's Specific' was advertised as the 'only remedy ever known to succeed'.[77] Much advertised towards the end of the nineteenth century was 'Perry Davis's Pain Killer', which, according to its maker, had 'started on its voyage around the world over forty years ago', and was 'recommended for sea sickness, amongst many other things!'[78] Similarly highly-advertised were 'Eno's Fruit Salt' and 'Beecham's Pills'.[79] These remedies often contained alcohol, sugar and opium.

Sea-sickness was distinctly tied up with disordered digestion, nausea and vomiting being a part of this wider affliction caused by movement of the ship, hence the reason why digestion-enhancing treatments were so often recommended. In 1849 a domestic servant named Julia wished to emigrate and wrote to an emigrant journal asking for advice on the state of provisions on board, what clothes she should take, and how she should avoid sea-sickness. The magazine printed a response to her questions, saying, typically, that there was no remedy for sea-sickness. She was told: 'Get your digestion in good order before starting; keep your feet warm with woollen stockings while ill. We have found cayenne pepper in soup very comforting, but there is no rule.'[80] Improving digestion was the rationale behind the use of Cadbury's Cocoa. Whilst not being a remedy for nausea and vomiting *per se*, the use of Cocoa was recommended to gain comfort and nutrition when it was not possible to digest any other types of food.[81] Ship surgeons, unable to prevent nausea and vomiting, also often turned to treating the frequently-accompanying constipation, in an attempt to ease discomfort.[82]

Most remedies were to be ingested and were thought to act directly on the abdomen. There were far fewer local applications, such as that patented by Pierre Molinari in 1858. Molinari claimed to prevent sea-sickness by adding to vinegar the following

[76] 'Prevention and Cure of Sea-Sickness', *The Times* (15th July 1817), p. 4.
[77] 'Sea-Sickness – Parker's Specific for Prevention and Cure', *The Times* (16th July 1851), p. 11.
[78] 'Around the World in 40 Years', *ILN* (20th September 1882), p. 363. This remedy was still being advertised a decade later.
[79] 'Eno's Fruit Salt', *ILN* (27th October 1888), p. 499; 'Beecham's Pills', *ILN* (9th April 1898), p. 529. For secondary literature on commodity culture and patent medicine at this stage see Richards T., *The Commodity Culture of Victorian England: Advertising and Spectacle, 1851-1914* (California: Stanford University Press, 1990), pp. 168-203.
[80] Coleman, *Passage to America*, p. 17.
[81] Wilson A., 'Cocoa for Sea-Voyagers', *ILN* (5th August 1893), p. 169.
[82] 5th May 1830, Folio 2, Medical journal for convict ship David Luon, ADM 101/19/3, TNA; 25th-29th July 1825, Folio 5, Medical journal for the convict ship Midas, ADM 101/53/6, TNA.

ingredients: rue, thyme, mint, rosemary, absinthe, turmeric, the green husks of walnuts, rocou, poppy heads and potash.[83] Wadding was then soaked in this mixture and placed on the pit of the stomach. Sea-cadet Knight's parents were unusual in asking whether he had tried an opium-plaster on his stomach in 1863, though opium was a commonly ingested remedy.[84]

Many of the popular treatments reflect the significance of the disturbing sensation of nausea. This symptom often characterised the condition; the term 'nausea' deriving from the Greek word 'naus', simply meaning ship.[85] According to the experience of Arctic whaler and explorer William Scoresby (1789-1857), if hardened seamen were to suffer the condition, this was likely to be the only symptom.[86] Nausea, and its associated vertigo and giddiness, were often the first and foremost complaints.[87] As such, Willmott's Antalgia was sold as a nausea preventative; the advertisement does not mention vomiting.[88] In his 1857 lectures on digestion Thomas King Chambers suggested that '[t]he best remedy for healthy persons to take is very frothy bottled porter: if it does not in every case prevent the vomiting, yet the prostration afterwards is certainly avoided, and the ejecta are not so disagreeable.'[89] Chambers also recommended chloroform to prevent the violent straining during vomiting, though lamented that it would not prevent nausea.[90]

Not only was nausea a distressing experience, but it was often premonitory to vomiting. Its prevention therefore often meant the prevention of vomiting. This stands in contrast to the majority of medical conditions dealt with in physiology and diagnosis texts, whereby nausea was generally seen merely as an unpleasant accompaniment to the physical act of vomiting. Moreover, whilst nausea served no purpose, some commentators considered vomiting from sea-sickness to be useful, attributing its

[83] 'Specification of Pierre Molinari: Composition for Preventing Sea-Sickness', *Patents Specifications* (London: Great Seal Patent Office, 1858), pp. 1-3.
[84] Letter to Henry Knight from his mother Adela Knight (née Portal), c. 1863, Letters received by Henry Knight, Knight Archives, 39M89/F121/10, Hampshire Records Office.
[85] Reason J.T. and Brand J.J., *Motion Sickness* (London: Academic Press, 1975), p. 2; Stocker, 'Sea-Sickness', p. 446.
[86] Stamp and Stamp, *Greenland Voyager*, p. 29.
[87] 'New Remedy for Sea Sickness', *Wesleyan-Methodist Magazine* (1823) **3:2**, p. 48; 'Theory of Sea-Sickness', *Chambers's Journal of Popular Literature, Science and Arts* (27th February 1858), p. 144.
[88] 'Prevention and Cure of Sea-Sickness', p. 4.
[89] Chambers T.K., 'Practical Lectures on the Management of the Digestion in Disease', *Lancet* (8th August 1857), p. 132.
[90] Chambers, 'Practical Lectures', p. 132. Also recommending chloroform: Harris W.P., 'Sea-Sickness: A Cure for It', *Lancet* (1st August 1857), p. 126.

benefits predominantly to the ridding of an excess of bile, or simply invigorating the constitution.[91] In his text on *How to Travel*, for example, Thomas Knox advised his readers that:

> Many persons will tell you that it is an excellent thing to be sea-sick, as you are so much better for it afterwards. If you are a sufferer you will do well to accept their statements as entirely correct, since you are thereby consoled and soothed, and the malady doesn't care what you think about it, one way or another.[92]

Chemical formulas were rarely noted to have been successful. Creosote, an anti-emetic, was often mentioned.[93] However, it was also criticised as, given in the wrong doses, it could make the sickness worse. James Henry Bennet argued in 1857 that chemical treatments were more commonly unsuccessful because they were expelled from the stomach before having the chance to work. He therefore suggested opium injections into the rectum. This was able to bypass the stomach and act directly on the nerves, encouraging sleep.[94]

Ship Surgeons and Experimentation

Personal reminiscences and surgeons' sick-lists indicate that they were dealing with nausea and vomiting on a daily basis, particularly at the beginnings of a journey. However, ship surgeons' theories regarding sea-sickness are rarely evident in their journals. Despite its occurrence being consistently recorded, their comments and remarks do not focus on this condition; arguably it was *too* common. That is not to say that they were uninterested. It is clear from correspondence published on completion of their journeys that they often held views on the matter. For example, the opinion of Dr W.P. Harris was published in *The Times* and the *Lancet* and cited again in the *ILN* in

[91] Sweetser W., *A Treatise on Consumption: Embracing an Inquiry into the Influence Exerted upon it by Journeys, Voyages and Changes of Climate* (Boston: T.H. Carter, 1836), pp. 182-3; Percy H., 'Sea-Sickness, a Remedy in Certain Cases of Jaundice', *Lancet* (24th August 1844), p. 673; Letter from AD Hudleston to his mother, 26th December 1820, Hudleston family of John Hutton, D HUD 13/12/10, Cumbria Record Office, Carlisle Headquarters; Letter to home from Charles Hodges, 1853, Charles Hodges Letter, D7367/1, Gloucestershire Archives; Coleman, *Passage to America*, p. 18.
[92] Knox T.W., *How to Travel* (New York and London: G.P. Putman's Sons, 1887), p. 53.
[93] 'Creosote in Sea-Sickness', *MTG* (September-April 1842-3) **7**, p. 79; 'On the Aetiology of Sea-Sickness', *Lancet* (27th December 1845), p. 698; 'Critical Digest', p. 667; Harris, 'Sea-Sickness', p. 126.
[94] Henry Bennet J., 'Sea-Sickness Treated by Opiate Injections', *Lancet* (15th August 1857), p. 178.

1857.[95] Harris wrote of his experiences with sea-sickness as the surgeon to the *Khersonese* steam-ship, noting his surprise that so many people believed it to be incurable. He suggested this was a result of ignorance amongst non-medical men and inactivity on the part of surgeons to supply remedies. Harris had learnt that the stomach should be allowed to empty itself and then the patient given chloroform in water. Similarly the ship surgeon, collector and researcher Thomas Morland Hocken (1836-1910), wrote to the *Lancet* in 1871 to share his understandings of the condition and the results of an experiment he had conducted. Whilst surgeon aboard the *Great Britain*, Hocken experimented with the use of remedies – chloroform, creosote, effervescents, hydrocyanic acid, alkalis, morphia and brandy, to name a few. He separated his patients into different classes and administered them with the specific remedy. Hocken found that hydrocyanic acid and creosote were the most effective. Chloroform did not work at all, and brandy made the attack shorter but increased its severity.[96]

For a self-limiting, largely non-fatal illness, remedies could easily be tested on board ship by individuals other than the surgeon. The physician Forbes Winslow (1810-74), having witnessed the beneficial effect of prussic acid on nausea and vomiting at sea, trialled it on two separate journeys, finding it ineffective and reporting as much to the *Lancet* in 1833.[97] Similarly, a passenger aboard the New York packet-ship *Quebec* was praised for giving other passengers a teaspoon of Cayenne pepper in sweetened, warm liquid. Eighteen passengers signed the letter recommending this remedy, which was also published in the *Lancet* in 1840.[98]

These experiments were not restricted to the early nineteenth century. In 1875 Crochley Clapham, whose work was mainly focussed on the brain, published the results of his experiments giving nitrate of amyl to patients, which he claimed had stopped vomiting in all but three of his 124 cases.[99] The author of an 1883 *BMJ* article who named himself as both traveller and surgeon, William Donovan, however, trialled the use of nitrate of amyl on a Channel crossing after reading an article on its successful use for sea-sickness. The after-effects were unbearable, according to Donovan, and based on his

[95] 'Sea Sickness Curable', *ILN* (15th August 1857), p. 171.
[96] Hocken, 'Treatment of Sea-Sickness', p. 337.
[97] Winslow F., 'Prussic Acid in Sea-Sickness', *Lancet* (20th July 1833), p. 538.
[98] Elliot J., 'Cayenne Pepper in Sea-Sickness', *Lancet* (8th August 1840), p. 736.
[99] Clapham C., 'Nitrate of Amyl in Sea-Sickness', *Lancet* (21st August 1875), p. 276.

experience as a Cunard surgeon he recommended preventative purgatives before the journey as an alternative.[100]

There is no evidence that indicates convicts, or other passengers, were used against their will during experiments. Rather sufferers, in desperate need of a cure, offered themselves as objects for experimentation; the creation of medical knowledge on sea-sickness was evidently of mutual benefit. Sea-sickness was also a rare condition in being able to affect the medical authority on board. Ship surgeons themselves were not immune to nausea and vomiting. When the whaler *Hercules* left Aberdeen in March 1831 it was not long before 'the surgeon and a passenger [were] prostrate in their bunks with seasickness'.[101] The surgeon continued to suffer almost constantly from sickness on the voyage to the Davis Strait, a region of the Arctic. Surgeons were unlikely, therefore, to have been entirely uninterested.

Sharing Knowledge

As noted, the results of experiments conducted on board by medical practitioners were frequently published in the popular press and medical journals. These were not restricted to the reports of physicians and surgeons. Such was the desire to find a cure that treatments found to be successful by individual passengers were also communicated to the wider public. In 1823 the monthly *Wesleyan-Methodist Magazine* published the words of a correspondent who had cured himself of violent sea-sickness by practising 'sharp libration of the body, such as it receives in trotting'.[102] Likewise, in 1859 *The Times* published a letter claiming that six or seven drops of creosote taken on loaf-sugar was a definite cure for sickness.[103] Medical journals also published non-medical sources. A letter from 'A Freshwater Sailor' published in the *Lancet* in 1843 promoted the benefits of vinegar and salt as a cure.[104]

Sea-sickness was thus a condition on the boundary of the medical sphere, whereby knowledge and experience could easily bypass medical authority. Advice about nausea

[100] Donovan W., 'Sea-Sickness', *BMJ* (26th May 1883), p. 1051.
[101] Gillies Ross W., *Arctic Whalers. Icy Seas* (Toronto: Irwin Publishing, 1985), p. 30.
[102] 'New Remedy for Sea Sickness', p. 48.
[103] One Who Wishes All to Enjoy Bedford Themselves, 'Creosote V. Sea-Sickness', *The Times* (1st June 1859), p. 12.
[104] A Freshwater Sailor, 'Sea-Sickness', *Lancet* (8th July 1843), p. 531. See also 'Sea-Sickness', *MTG* (April-September 1843) **8**, p. 283.

and vomiting was transferred between sufferers and aided by popular interest, which allowed a wide dispersal of opinions. Similarly, new medical advice was a fashionable topic for the press. In 1828 the weekly-published *Kaleidoscope* contained the medical advice of physician Augustus Bozzi Granville (1783-1872), from his journal of travels to and from St. Petersburg, who successfully recommended forty-five drops of laudanum to the Countess of Woronzow for her Dover to Calais crossing.[105] Additionally, the literary commentator for the *Mirror* magazine in 1827 discussed Neil Arnott's (1788-1874) recently-published second edition of *Elements of Physics*, specifically commenting on his explanation of sea-sickness.[106] Arnott claimed that sea-sickness was a result of a misconception of an individual's centre of gravity, and also 'partly depends on the irregular pressure of the bowels among themselves and against the containing parts, when the influence of their inertia and weight varies with the rising and falling of the ship.'[107] Medical explanations for the occurrence of nausea and vomiting at sea, alongside recommended remedies, also appeared in travel literature; the inclusion of a preventive to sea-sickness in a hand-book to Paris was used as a selling point. [108] The extent of published works on sea-sickness led the author, self-named 'An Old Sailor', to write that sea-sickness had an entire literature of its own, with theoretical explanations, antidotes and remedies which 'rival[led] one another in their multiplicity'.[109]

Preventive methods were also shared by way of patents. Nausea and vomiting aboard ships were noticeably different from these symptoms caused by a biological or chemical dysfunction. The external cause – movement of the ship – was quite clear. In addition to medicinal products to be taken by the sufferer, it is therefore not surprising that a large number of mechanical techniques were patented and advertised, particularly in the mid nineteenth century. Several of these patents are shown in Figures 15-17, towards the end of this section. The most popular design was arguably that of the belt, or girdle, the success of which was explained by its mechanical force on the abdomen preventing its

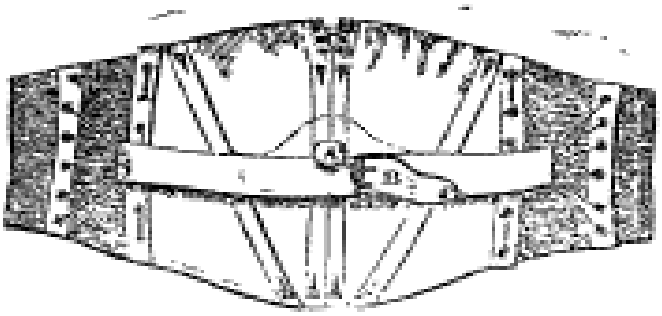
[105] 'Sea-Sickness', *The Kaleidoscope; or, Literary and Scientific Mirror* (30th September 1828), p. 104.
[106] 'Centre of Gravity, in Reference to Sea-Sickness', *Mirror of Literature, Amusement, and Instruction* (11th August 1827), p. 111.
[107] Quote from Arnott W., *Elements of Physics, or Natural Philosophy, General and Medical*, vol. 1, 2nd American from the 4th London edn (Philadelphia: Carey and Lea, 1831), p. 161.
[108] Cullimore D.H., *The Book of Climates: Acclimatization; Climatic Disease; Health Resorts and Mineral Springs; Sea Sickness; Sea Voyages; and Sea Bathing*, 2nd edn (London: Ballière, Tindall and Cox, 1891), pp. 252-3; 'Multiple Classified Advertising Items', *ILN* (27th May 1843), p. 362.
[109] An Old Sailor, 'Sea Sickness', p. 1.

movement when the ship rolled.[110] Levilly's Thalaszone (from the Greek for 'sea' and 'belt'), shown in Figure 15, had padded steel plates at the front and back, and could be tightened with a screw.[111] Another belt proposed in the *Lancet* had air sacs that could be inflated using a hand pump, in order for it to be fitted comfortably and with the desired pressure when the sea was rough.[112]

Similarly attempting to minimise the impact of motion on the body were swinging chairs or platforms, such as the apparatus designed by Michael Hodge Simpson, patented in 1867, and shown in Figure 16.[113] Earlier, in 1845, a swing sofa invented for the purpose of preventing sea-sickness had been placed in a gallery of useful inventions at the Royal Polytechnic Institution. According to a report in the *Chambers's Edinburgh Journal*, a number of higher class passenger ships had installed these.[114] With most inventions and patents, however, it is difficult to establish whether the ideas were adopted. Furthermore, whilst the position of the body as a whole was frequently considered central to controlling sea-sickness, equipment was not always available. Simply lying down was therefore a common recommendation. The benefit of this method was articulated by Corrigan, who wrote that sufferers should 'let head, body, and back become, as it were, part of the vessel, participating in its motion without muscular effort.'[115] It was important that these methods were employed before nausea and vomiting had commenced.

Removing sight of the ship's movement was a further common preventive, the rationale being that nausea and vomiting were brought on by sensory disruption. This could simply be achieved by closing the eyes, though comfort was considered in the patenting of the eye mask, shown in Figure 17.

[110] 'Sea-Sickness', *Mirror of Literature, Amusement, and Instruction* (12th August 1843), p. 115; 'Specification of Edward Griffith Brewer: Belts for Preventing Sea-Sickness', *Patents Specifications* (London: Great Seal Patent Office, 1872), pp. 1-5.
[111] 'Levilly's Thalaszone, or Sea-Sickness Preventive', *Lancet* (27th August 1853), p. 189.
[112] Nunn P.W.G., 'Sea-Sickness, Its Causes and Treatment', *Lancet* (17th December 1881), p. 1038.
[113] 'Specification of Isaac Ashe', *Patents Specifications* (London: Great Seal Patent Office, 1863), pp. 1-5; 'Specification of John Henry Johnson: Apparatus for Preventing Sea-Sickness', *Patents Specifications* (London: Great Seal Patent Office, 1864), pp. 1-5.
[114] 'Sea-Sickness', *Chambers's Edinburgh Journal* (25th January 1845), p. 64.
[115] Corrigan, *Ten Days in Athens*, pp. 46-7. Corrigan's views on sea-sickness were considered by the literary commentator for the *ILN* as 'most important as issuing from so high an authority'. See 'Literature', *ILN* (3rd May 1862), p. 452.



A, is a screw, effecting, at will, a local pressure by means of two plates, the action of which prevents the sickness.
B, is a strap, to procure a greater pressure, if required.

Figure 15. Levilly's Thalaszone

Source: 'Levilly's Thalaszone, or Sea-Sickness Preventive', *Lancet* (27th August 1853), p. 189.

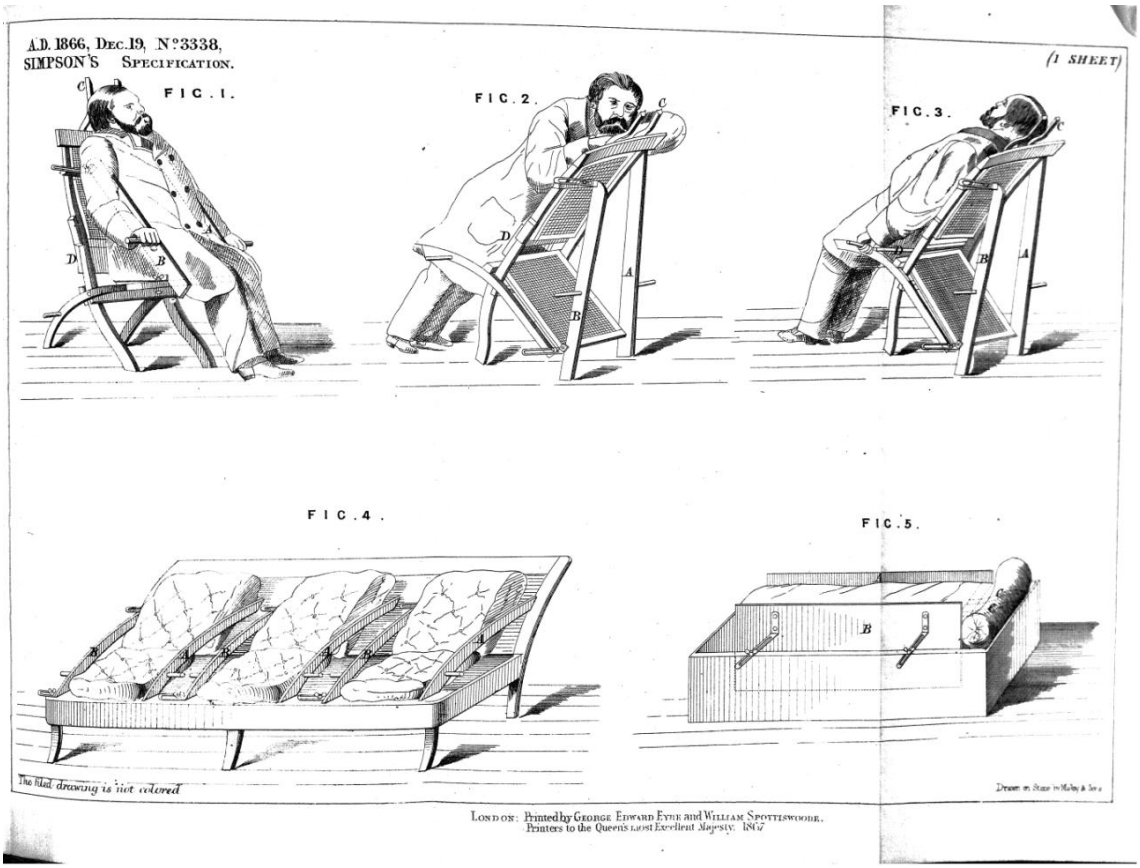


Figure 16. Simpson's apparatus for preventing sea-sickness

Source: 'Specification of Michael Hodge Simpson: Apparatus for Preventing Sea-Sickness', *Patents Specifications* (London: Great Seal Patent Office, 1867), pp. 1-6.

Figure 17. Bordin's specification for preventing sea-sickness

Source: 'Specification of Hortense Anastasie Bordin: Preventing Sea-Sickness', *Patents Specifications* (London: Great Seal Patent Office, 1868), pp. 1-4.

A combination of these last two designs – the swinging chair and eye mask – was described in a letter to the editor of *The Times* in 1853. According to the author: 'A swinging cot was constructed, with a top frame over it, fitted with curtains, so as effectually to screen the deck overhead, and other parts of the vessel, from the view of the recumbent invalid.'[116] Motion could therefore not be sensed, and the sufferer was freed from the 'dizzying effect of the vessel appearing to roll one way and the cot another'.[117]

It is evident from the multiplicity of remedial methods that there was no agreed understanding of the cause of nausea and vomiting at sea during the early and mid nineteenth century, beyond the generic impact of movement. As a condition it had no consistent explanation; it could be perceived as a disorder of digestion, irritation from internal movement or disruption of the senses. There was also no clear authority on the matter. Nausea and vomiting at sea were personal health issues, but also symptoms that could be attended by a physician. Despite their individualised nature, I will show in the next section that the occurrence of nausea and vomiting at sea was problematic in many public arenas.

5.4. Public Health

The Environment of the Ship

Nausea and vomiting affected individuals on a variety of forms of travel. The type of vessel had some influence on how or why the condition was experienced, and responses to it. Accounts of whalers make sea-sickness sound endemic. In 1860, aboard the *Daniel Webster*, nearly all of the forty crew were sea-sick, the author of the account himself suffering for three weeks.[118] It was often the very first experience that crewmen aboard whalers encountered. Captain William Barron, in the narrative of his *Old Whaling Days* (1895), recalled how after completing three years training for sea service he was made apprentice aboard the *Truelove*.[119] The ship sailed for the Davis Strait a few days later, with Barron as a cabin boy to the master, mate and doctor. Very soon after leaving Hull he recalled:

[116] SI SIC OMNES, 'Sea-Sickness', *The Times* (13th May 1853), p. 7.
[117] SI SIC OMNES, 'Sea-Sickness', p. 7.
[118] Gillies Ross, *Arctic Whalers*, p. 177.
[119] Barron W., *Old Whaling Days* (Hull: William Andrews & Co., The Hull Press, 1895), p. 1.

> I began to feel the symptoms of sea-sickness for the first time. The crew were too busy to pay any attention to me, so I sat upon a spare spar feeling far from well. Our Captain told me to inform him when I felt sick, and I expected he would have given me some relief. The boatswain was ordered to bring a rope's end, and I then guessed what kind of relief was meant. Captain Parker was too kind, however, to prescribe such a panacea for my indisposition, and I found out that he was joking. He good-humouredly told me to knock about and I should soon be better.[120]

It did not take Barron long, one suspects partly as a result of lack of sympathy, until he 'became thoroughly well seasoned.'[121]

Aboard whalers many sailors would have been too busy to show concern for sea-sickness. The whaling chronicler Robert Ferguson (1855-1935) referred to whaling novices, such as Barron would have been, as 'green hands'.[122] During Ferguson's sixteenth-month voyage to Hudson Bay, north-eastern Canada, he wrote that '[i]t was not long before the green hands began to feel squeamish. Their faces turned gray or yellowy-greenish as they hurried to the rail or made off to their bunks.'[123] As the sea continued to get rough, with the ship rolling heavily, Ferguson noted that the men on deck were shorthanded, as a result of the green hands all being sick below deck.[124] However, even experienced whalers such as Scorseby were liable to suffer sickness, most commonly in particularly bad weather. He personally found sea-sickness a distressing illness, noting how it depressed men's spirits, and actually became more violent as time passed.[125] In fact, sickness was so engrained in whaling culture that it was included in their songs:

> It's now we're out to sea my boy
> The wind comes on to blow
> One half the watch is sick on deck
> The other half sick below[126]

[120] Barron, *Old Whaling Days*, p. 2.
[121] Barron, *Old Whaling Days*, p. 3.
[122] Ferguson R., *Arctic Harpooner: A Voyage on the Schooner Abbie Bradford 1878-1879,* Stair L.D. (ed.) (Philadelphia: University of Pennsylvania Press, 1938), p. 3.
[123] Ferguson, *Arctic Harpooner,* p. 3.
[124] Ferguson, *Arctic Harpooner,* p. 4.
[125] Stamp and Stamp, *Greenland Voyager*, p. 29.
[126] Verse from 'Blow Ye Winds'. Huntington G., *Songs the Whalemen Sang*, 2nd edn (New York: Dover Publications, 1970), p. 43.

Entire ships of sailors suffering nausea and vomiting were not uncommon; John Hooton reported this extent of sickness amongst the crew on his emigration voyage to Pennsylvania in 1858.[127] In extreme cases sufferers were discharged from service. For example, Knight became a naval cadet in 1861. His constant illness prompted his father, Edward Knight, to write to the captain aboard the HMS *Resistance* in 1863 (serving in the English Channel), asking him to discuss with the doctor whether his son should stay on shore at Edinburgh.[128] The captain, William Chamberlain (1818-78), had discharged Henry by the end of that year.[129] Even sailors who managed to overcome their sickness over time, or by becoming accustomed to the ship, could relapse if they were transferred to a ship they had not sailed on before, according to Moore's experience.[130] Nonetheless, resignation on the grounds of sea-sickness was evidently not straightforward. The resignation of one unfortunate naval surgeon, who claimed his 'life [was] rendered unbearable from sea-sickness', was refused in a Parliamentary session of 1873.[131] The reporter for the *BMJ* commented on how doubtful it was that this officer could 'really be a great comfort and stay to his ship-mates', and that this oppressive decision would certainly not make the service any more attractive.[132]

Convict ships, as earlier suggested, often reported large numbers of sea-sick passengers.[133] This may have been a result of the convicts being kept below deck, unable to roam around the ship. Indeed, the surgeon aboard the convict ship *Earl St Vincent*, sailing to New South Wales, reported allowing the convicts on deck on the 11th August 1818 as they were so ill.[134] The next day he recorded: 'many of the convicts so sick as to be literally forced on deck'.[135] Furthermore, on the 2nd January 1822 the ship surgeon for the *Richmond* ordered the irons to be taken off a convict named Samuel Shannon, partly on account of his good behaviour, but also because of the extent of sea-

[127] 'The loss of the "Europa"', *ILN* (24th June 1854), p. 591; Letter from John Hooton to his mother, 13th June 1858, Letters of John Hooton, sailor, to his family (1837-1858), H1/DX/526/3, H1 Emigration, Liverpool Museums, Merseyside Archives.
[128] Letter to Henry Knight from his mother, 39M89/F121/10. See also: 14th July 1825, Letter to Winchelsea overseers from Captain William Hume, Sunderland, Overseers of the poor: correspondence, Parish of Winchelsea, PAR511/35/1, East Sussex Record Office. The document states that Thomas Fisher had left his ship due to sea-sickness.
[129] 20th December 1863, Letter from William Chamberlain of HMS Resistance, Papers of Henry Knight, Knight Archives, 39M89/F122/7, Hampshire Records Office.
[130] 'Critical Digest', p. 668.
[131] 'The Week', *BMJ* (27th September 1873), p. 380.
[132] 'The Week', p. 380.
[133] 2nd May 1819, Folio 3, Journal of the convict ship John Barry, ADM 101/38/1, TNA; 1st August 1820, Folio 5, Diary of the male convict ship Maria, ADM 101/49/2, TNA; 10th July 1828, Folio 10, Medical journal for convict ship Albion, ADM 101/1/9/5, TNA.
[134] 11th August 1818, Folio 4, Journal of the convict ship Earl St Vincent, ADM 101/21/7A, TNA.
[135] 12th August 1818, Folio 4, Journal of the convict ship Earl St Vincent, ADM 101/21/7A, TNA.

sickness he was suffering.[136] Slaves, due to their physical restraints, were also often depicted as suffering particularly severely. In the story of the 'Capture of a Slaver', the author wrote of 'that dread [sic] first night, when the poor captives become fully alive to the awfulness of their situation; when sea-sickness seizes them, and multiplies their agonies tenfold.'[137]

Naval Architecture

Although individuals on ships were affected by, and experienced, sea-sickness differently, often dependent on their role as passenger, crewman, or convict for example, the fact remained that any and every type of ship could induce nausea and vomiting. Any means by which a ship's motion, or the perception of motion, could be overcome therefore caught the attention of sea-sickness commentators. The lack of illness was often cited as one of the positive mid nineteenth-century justifications for a tunnel connecting England with France, for example, as the degree of motion was expected to be smaller on a train than on a ship.[138] Conversely, some commentators suggested that on a calm summer day the steam-boat crossing was pleasanter than a stifling tunnel – even sea-sickness was 'a trifle compared to the injurious physical effects of two hours' confinement in an underground passage'.[139] Despite positive views such as these, by the twentieth century they had become too prominent to avoid mockery. In 1907 G.K. Chesterton (1874-1936) wrote in his weekly contribution to 'Our Note Book' – a sort of gossip column – that '[t]he Channel Tunnel is taken as a topic in that cheery English way which is the most astonishing and delightful thing in the world. It is regarded entirely as an opportunity for jokes about sea-sickness.'[140]

Yet efforts to avoid sea-sickness were at times perceived with the utmost seriousness, and attempts to tackle nausea and vomiting occurred on a huge scale during the nineteenth century. As the below images demonstrate, this included machinery (Figure 18), such as the patents previously looked at, but also numerous ship-designs (Figure 19).

[136] 2nd January 1822, Folio 13, Medical journal of the convict ship Richmond, ADM 101/64/2, TNA.
[137] 'Capture of a Slaver', *ILN* (20th June 1857), p. 595.
[138] 'Proposed Anglo-Gallic Submarine Railway', *ILN* (10th November 1858), p. 570; 'Echoes of the Week', *ILN* (7th July 1866), p. 22.
[139] 'Crossing the Channel', *ILN* (23rd August 1884), p. 187.
[140] Chesterton G.K., 'Our Note Book', *ILN* (19th January 1907), p. 84.

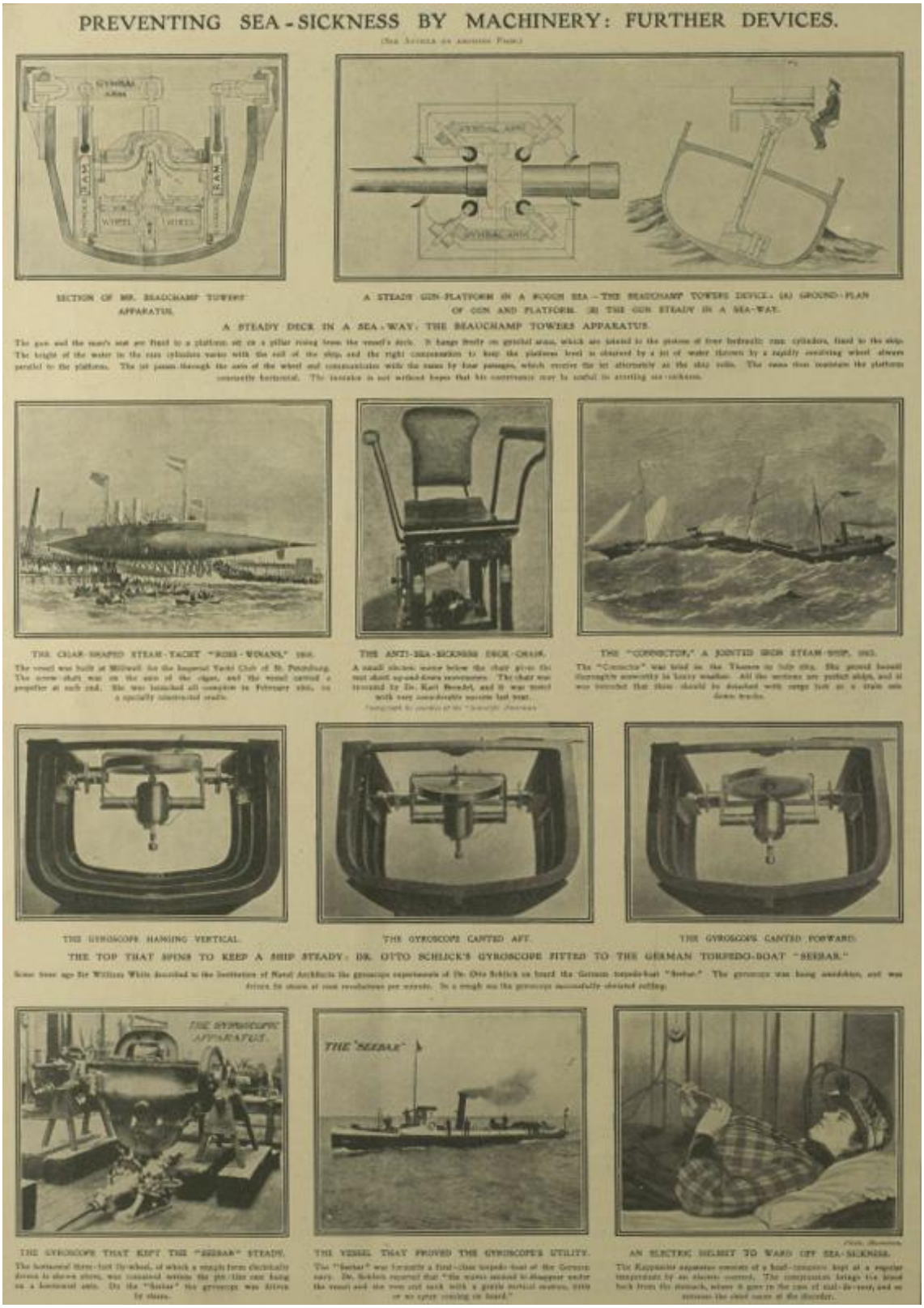


Figure 18. Preventing sea-sickness by machinery

Source: 'Preventing Sea-Sickness by Machinery: Further Devices', *ILN* (26th October 1907), p. iv.

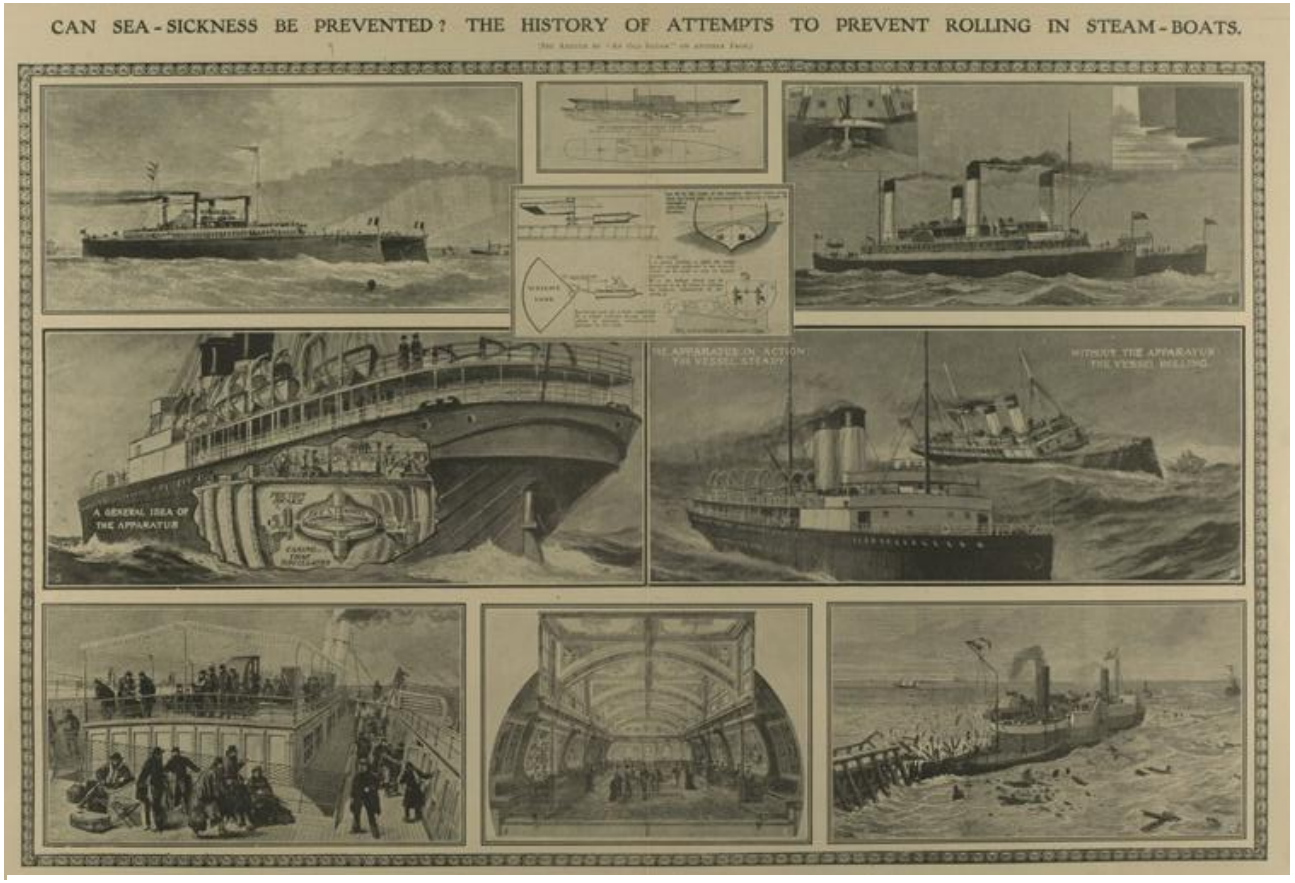


Figure 19. Attempts to prevent rolling in steam-boats

Source: 'Can Sea-Sickness be Prevented? The History of Attempts to Prevent Rolling in Steam-Boats', *ILN* (26th October 1907), pp. ii-iii.

The size and speed of a ship was often considered to play an important role in preventing sea-sickness. For instance, during an 1872 session of Parliament a bill was passed to improve communication between France and England.[141] This was to involve deepening the ports at Newhaven and Dieppe. The benefits of this route, discussed by the scientific reporter for the *ILN*, depended on the type of vessels employed. Small, 'imperfect steamers' were currently in use, which would be no good for the longer journey proposed.[142] However, if larger, faster steamers were to be built then this problem would be eliminated. Passengers, the reporter wrote, would suffer less sickness, would have more space to walk around, and more accommodation to lie down in, thus increasing comfort and lessening monotony.[143] This discussion reflected general understandings of the relationship between ship designs, their movements, and their ability to induce nausea and vomiting. It was a popular theory that the rolling of a ship was 'far more trying than the "pitching" movement to one's power of preserving the equilibrium, as well as one's digestive organs.'[144] Larger, faster steamers were thought to have less 'heaving or oscillating motion', meaning that passengers would not be as affected.

These opinions were not merely expressed in popular literature. In 1874 Royal Navy Admiral Edmund Gardiner Fishbourne (1811-87) published a treaty entitled *Our Ironclad and Merchant Ships*, which he had written in reaction to the disaster of the HMS *Captain*, which had capsized in September 1870 due to instability, costing nearly 500 lives.[145] Rolling was a central concern in the safety of these ships and much of Fishbourne's text is spent discussing the type of rolling (slow or fast) that was more conducive to hydrodynamic stability. Yet he also acknowledged the benefits which the stomach would receive should rolling be prevented.[146] The offhand way in which the author made this comment indicates how engrained this notion was in understandings of naval architecture and the effect of the ship on the body.

[141] 'Scientific Results of the Month', *ILN* (31st August 1872), p. 210.
[142] The sea mileage between London and Paris via Newhaven and Dieppe was actually greater than the distance via Dover and Calais or Folkestone and Boulogne.
[143] 'Scientific Results of the Month', (August 1872), p. 210.
[144] '"Scene on Board a French Steamer"', p. 294.
[145] Fishbourne E.G., *Our Ironclads and Merchant Ships* (London: E. & F.N. Spon, 1874), p. 7. Thanks to Don Leggett for recommending this text.
[146] Fishbourne, *Our Ironclads*, pp. xiv-xv.

The Bessemer Saloon

In the late 1860s and 1870s a project initiated by Henry Bessemer (1813-98) clearly caught the public's attention.[147] Bessemer was an engineer and inventor, best known after his death for developing the 'Bessemer process' for the manufacture of steel. He was also, however, well known in the public sphere for his patenting of the Bessemer Saloon in December 1869. In his *Autobiography*, Bessemer's justifications for his invention are outlined:

> Few persons have suffered more severely than I have from sea sickness, and on a return voyage from Calais to Dover in the year 1868, the illness commencing at sea continued with great severity during my journey by rail to London, and for twelve hours after my arrival there.[148]

His sickness was so severe that it was necessary for his doctor to stay with him through the night. As a result of this experience Bessemer was inspired to create a model vessel which was subjected, by clockwork, to the expected pitching motions of a ship. The patent was eventually granted upon the following designs, shown in Figure 20.[149]

[147] Bessemer was cited directly by Fishbourne in reference to the effect of rolling on the stomach. See Fishbourne, *Our Ironclads*, pp. xiv-xv.
[148] Bessemer H., *Sir Henry Bessemer, F.R.S: An Autobiography. With a Concluding Chapter* (London: Offices of Engineering, 1905), p. 304.
[149] Bessemer, *An Autobiography*, p. 304.

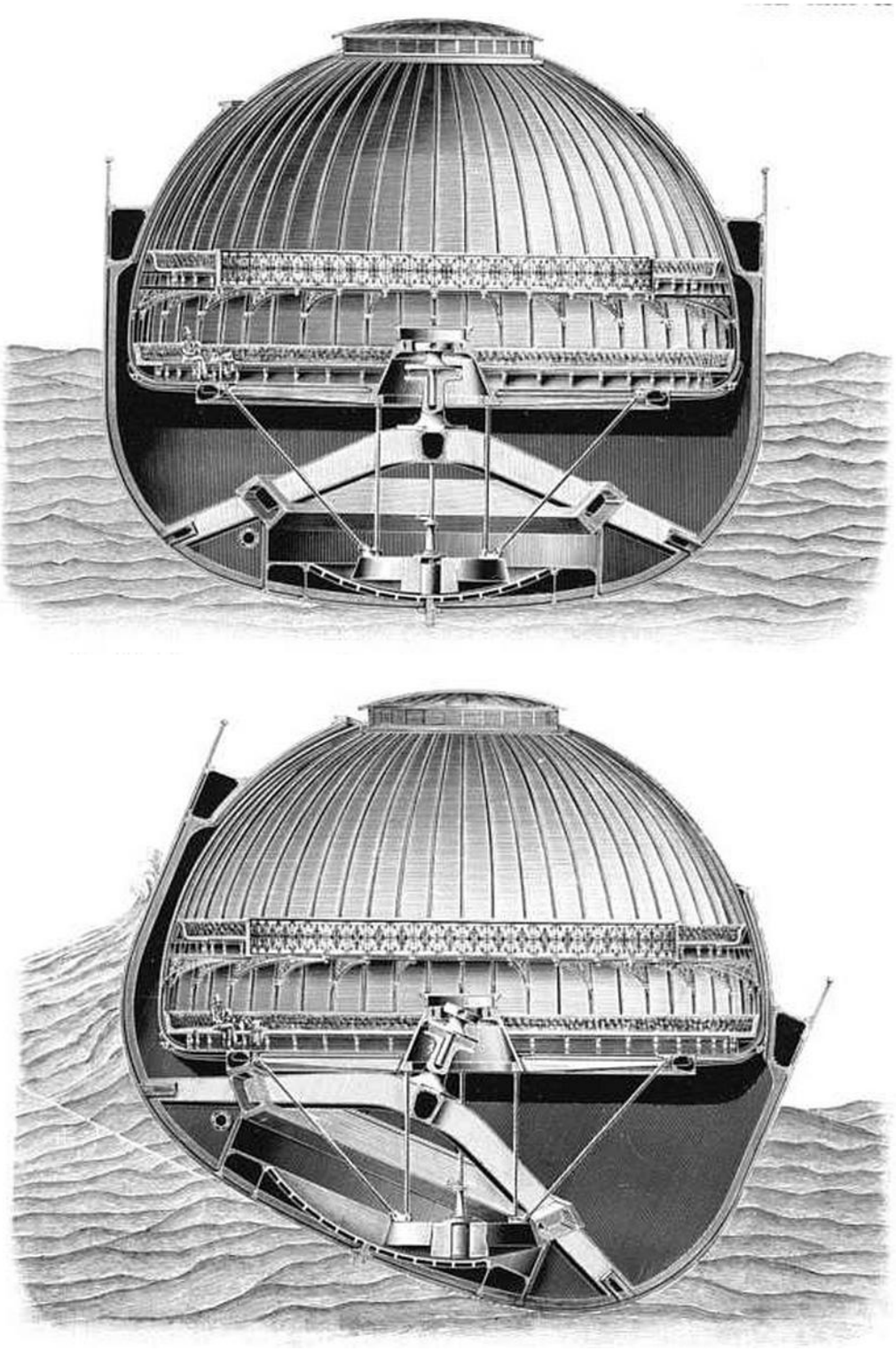


Figure 20. Sections through the Bessemer Saloon in still water (top) and with the vessel rolling (bottom)

Source: Bessemer H., *Sir Henry Bessemer, F.R.S: An Autobiography. With a Concluding Chapter* (London: Offices of Engineering, 1905), images opposite p. 304.

Much reported in the *ILN*, the Bessemer Saloon was designed explicitly for the prevention of sea-sickness. It worked, according to an early report,

> by suspending the cabin of a ship in gimbals [pivoted supports allowing the rotation of an object about a single axis] much in the same way as a compass is suspended, and which will enable a vessel to roll or pitch without the motion being communicated to the cabin.[150]

It thus acted much like a hammock.

Bessemer designed the saloon with Edward James Reed (1830-1906). Reed had been made Chief Constructor of the Navy in 1863, following an influential early career in naval architecture during which time he overturned traditional methods of ship design: 'rules of thumb gave way to calculations based on theoretically sound principles and careful experiment'.[151] When working with Bessemer as the Naval Constructor to the Bessemer Saloon Ship Company (established in 1869), he held a high position within Earle's Shipping Company, an engineering company in Hull to which he had become chairman in 1871. Bessemer also employed Admiral Sir Spencer Robinson (1809-89) to his Board of Directors. Robinson was a Director of Earle's Shipbuilding Company, who worked closely with Reed throughout their careers. According to Bessemer's autobiography, the ship was to be designed by Reed and modified by Bessemer according to his vision of the saloon.[152] The proposed appearance of the Saloon is illustrated below, in Figure 21.

[150] 'Scientific Results of the Month', *ILN* (23rd July 1870), p. 99.
[151] Brown D.K., 'Reed, Sir Edward James (1830–1906)', *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004) [http://www.oxforddnb.com/view/article/35707, accessed 30th November 2011].
[152] Bessemer, *An Autobiography*, p. 309.

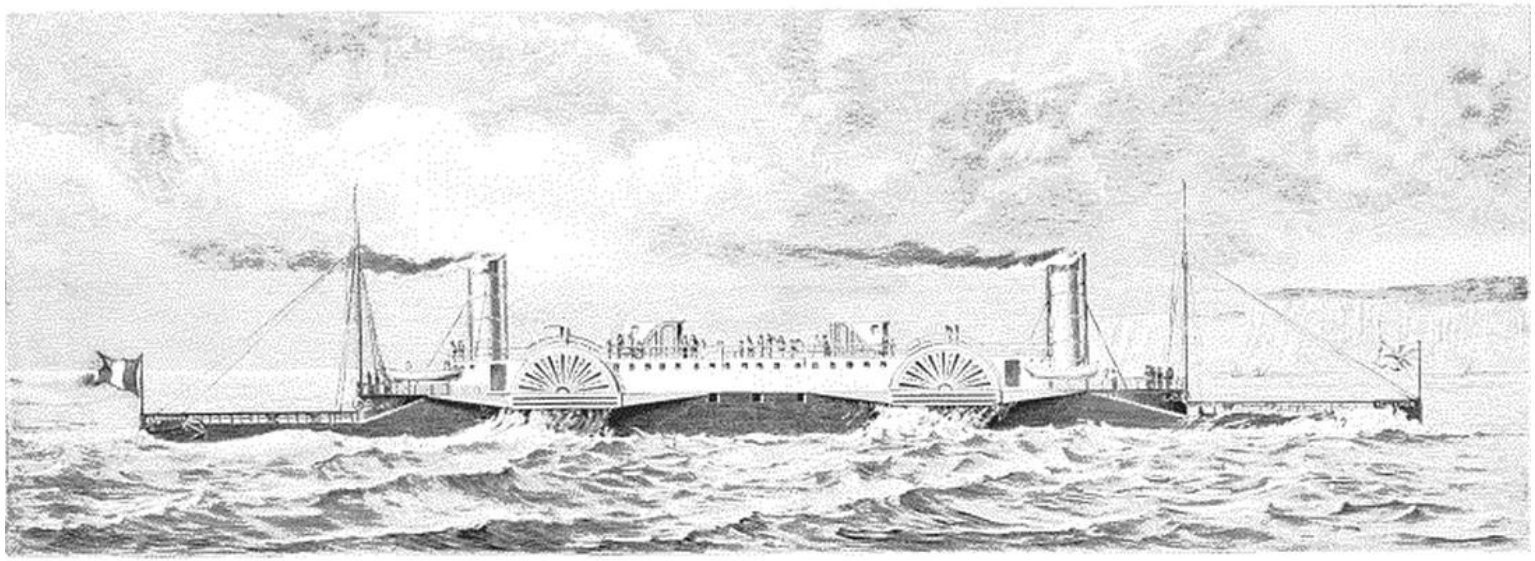


Figure 21. The general appearance of the Bessemer Saloon

Source: Bessemer H., *Sir Henry Bessemer, F.R.S: An Autobiography. With a Concluding Chapter* (London: Offices of Engineering, 1905), images opposite p. 315.

Despite the high-profile architects that Bessemer worked with and his apparent devotion to the project, his designs received some criticism. One direction from which this came was the owner of a rival project, The Dicey Channel Steamer, a development contemporary to Bessemer's project. Captain Dicey's plan was for a twin-ship to prevent sea-sickness, based on a catamaran design he had witnessed in Eastern waters during his time in the Indian Navy.[153] The concept dictated that any force of waves inflicted upon one hull was counteracted by the opposite hull. The idea was adopted by the English Channel Steam-Ship Company and the *Castalia* was launched at the dockyard of the Thames Shipbuilding Company at Blackwell, on 6th June 1874, by Lady Castila Rosalind Granville (d.1938) after whom she was named.[154] On 21st November 1872 a Director of the Dicey Company, Admiral George Elliot (1813-1901), expressed his criticism of Bessemer's design in *The Times*. He claimed that the pendulous motions of the ship counteracted by the swinging saloon were not the worst cause of sea-sickness. Rather he claimed from experience that lateral, vertical and onwards motions were 'more trying to the gastric nerves'.[155] Furthermore, by reducing buoyancy at both ends, Elliot claimed, the ship must travel at reduced speeds for safety, thereby merely prolonging the journey time and the opportunity for sickness.

Thus, to combat sea-sickness naval architects had to interfere considerably with the safety and efficiency of the vessel. Nonetheless, the attempts made to do so demonstrate the extent of support these projects received. Reed's response to Elliot's criticisms was published in *The Times* on the 26th November 1872 and indicated his confidence in, and personal support for, the project. His primary belief for the necessity of the Bessemer saloon was that current steam-ships were too small meaning that 'they knock about terribly in rough weather.'[156] Reed wrote that

> I do not put her forward as a perfect remedy for sea-sickness in all cases, although I think she will be found a sufficient remedy in the Straits of Dover. Her advantages seem to me to be that she will be large enough herself to escape all but very small movements as regards lifting bodily and pitching […] The rolling of the ship, which is the

[153] Dumpleton B., *The Story of the Paddle Steamer* (Melksham: Venton, 1973) p. 68.
[154] 'Metropolitan News', *ILN* (6th June 1874), p. 531.
[155] Elliot G., 'Channel Passage Ship', *The Times* (21st November 1872), p. 12.
[156] Reed E.J., 'Rival Channel Steamers', *The Times* (26th November 1872), p. 4.

> only remaining movement of importance, will be perfectly neutralised by Mr. Bessemer's hydraulic arrangements.[157]

He concluded that

> she will thoroughly fulfil the object which the travelling public desire – namely, that of enabling us to cross to and from the Continent with health, decency, and comfort, instead of being subjected, as we now are in bad weather, to conditions which violate all these, and are in every respect disgraceful to the age we live in.[158]

In his letter, Reed mentioned 'every random prophecy that has been printed respecting her', hinting to the attention that the project had received.

Despite these disagreements, the concept of a ship that prevented sea-sickness continued to meet with much intrigue. In fact on 14th December 1872 the *ILN* published illustrations of Reed and Bessemer's designs.[159] However, concerns were continually voiced by objectors, mainly from a structural viewpoint. These included, for example, the fact that the hull would move while the cabin was stationary, meaning that the cabin would be cut off from the rest of the ship.[160] Furthermore, the size of the ship meant that it was not possible to turn around in harbour. The ship therefore had to be capable of running backwards and forwards, a task that many believed to be extremely difficult to achieve.[161] From the view of preventing sickness, doubts also came from men without a vested interest, who were not competitors. A scientific reporter wrote in 1870 that 'the worst motion at sea is when the vessel sinks down between waves, and it does not appear to us that this motion will be wholly prevented by Mr. Bessemer's arrangement.'[162]

While Dicey's *Castalia* was hailed as a success in October 1875, being 'less productive of sea-sickness than the ordinary Channel steamers', Bessemer's high-profile project was not so fortunate.[163] During the previous month the Bessemer Steam-Boat Company had gone into liquidation, and the Saloon was for sale. The *ILN*'s scientific reporter

[157] Reed, 'Rival Channel Steamers', p. 4.
[158] Reed, 'Rival Channel Steamers', p. 4.
[159] 'The Bessemer Saloon Steam-Ship', *ILN* (14th December 1872), p. 571.
[160] 'Scientific Results of the Month' (July 1870), p. 99.
[161] 'Scientific Results of the Month', *ILN* (21st December 1872), p. 595.
[162] 'Scientific Results of the Month' (July 1870), p. 99.
[163] 'Scientific Results of the Month', *ILN* (30th October 1875), p. 446.

cited the cause as the inability of the Bessemer Saloon to enter French harbours safely.[164] A public trial journey to Calais had been organised and so a rehearsal was conducted beforehand. During the rehearsal, on its second attempt to enter the harbour the Saloon hit the pier, causing extensive damage. Both Reed and Robinson, however, assured Bessemer that it was not due to a failure of the ship, but to the captain's steering.[165] They further placated Bessemer by arguing that although the Saloon was not running between England and France, she was 'built primarily for the purpose of showing that the rolling motion of a passenger steamer might be neutralised' and that it was well known to be 'a great experiment'.[166] They argued that such novel machinery would require experience and minor modifications to be successful.

As a result of the damage to the ship on her practice run, the workload to complete the project had greatly increased. As such, Reed was unable to make the final additions, namely the swinging saloon, before her public trial. The 'fatal day' for the ship came on the 8th May 1875. Bessemer described what happened at the end of a very successful crossing:

> we had arrived -- very slowly, it must be admitted -- at the entrance of Calais Harbour. I, knowing what had occurred on a previous occasion, held my breath while the veteran Captain Pittock gave his orders to the man at the helm. But the ship did not obey him, and crash she went along the pier side, knocking down the huge timbers like so many ninepins![167]

The damage, £34,000 worth, was too costly to repair and the reputation of the project was too discredited for it to continue. Nonetheless, according to Bessemer his 'hydraulic controlling apparatus was never completed, was never tested at sea, and consequently never failed', despite the publicity which it received that stated otherwise.[168]

After the *Castalia* and Bessemer's Saloon came the *Calais-Douvres*, a modified version of the *Castalia*, which had twin hulls and received some praise from travellers. A letter

[164] 'Scientific Results of the Month', *ILN* (4th September 1875), p. 239.
[165] Bessemer, *An Autobiography*, p. 319.
[166] Bessemer, *An Autobiography*, p. 320.
[167] Bessemer, *An Autobiography*, p. 323.
[168] Quote from Bessemer, *An Autobiography*, p. 326. A report in the *ILN* disagreed; see 'Scientific Results of the Month' (September 1875), p. 239.

to *The Times* from a passenger mentioned that very few people had been sick, despite the weather being exceptionally rough.[169] However, she was a slow ship and was only in service for nine years, between 1877 and 1886. There was evidently a fine balance between a safe and efficient ship, and one that avoided sea-sickness.

A medical history footnote to this story is that the *Castalia* was purchased by the Metropolitan Asylums Board in 1883, converted into a floating smallpox isolation hospital and moored in Long Reach on the Thames, with two other ships. This followed the recommendation of the Royal Commission on Smallpox and Fever hospitals that the number of isolation beds in the capital be increased.[170] The *Castalia* before and after her conversion is shown below, in Figure 22.

[169] A Sufferer from Sea-Sickness, 'The Calais-Douvres', *The Times* (16th October 1878), p. 6.
[170] Ayres G.M. *England's First State Hospitals, 1867-1930* (London: Wellcome Institute for the History of Medicine, 1971), p. 80.

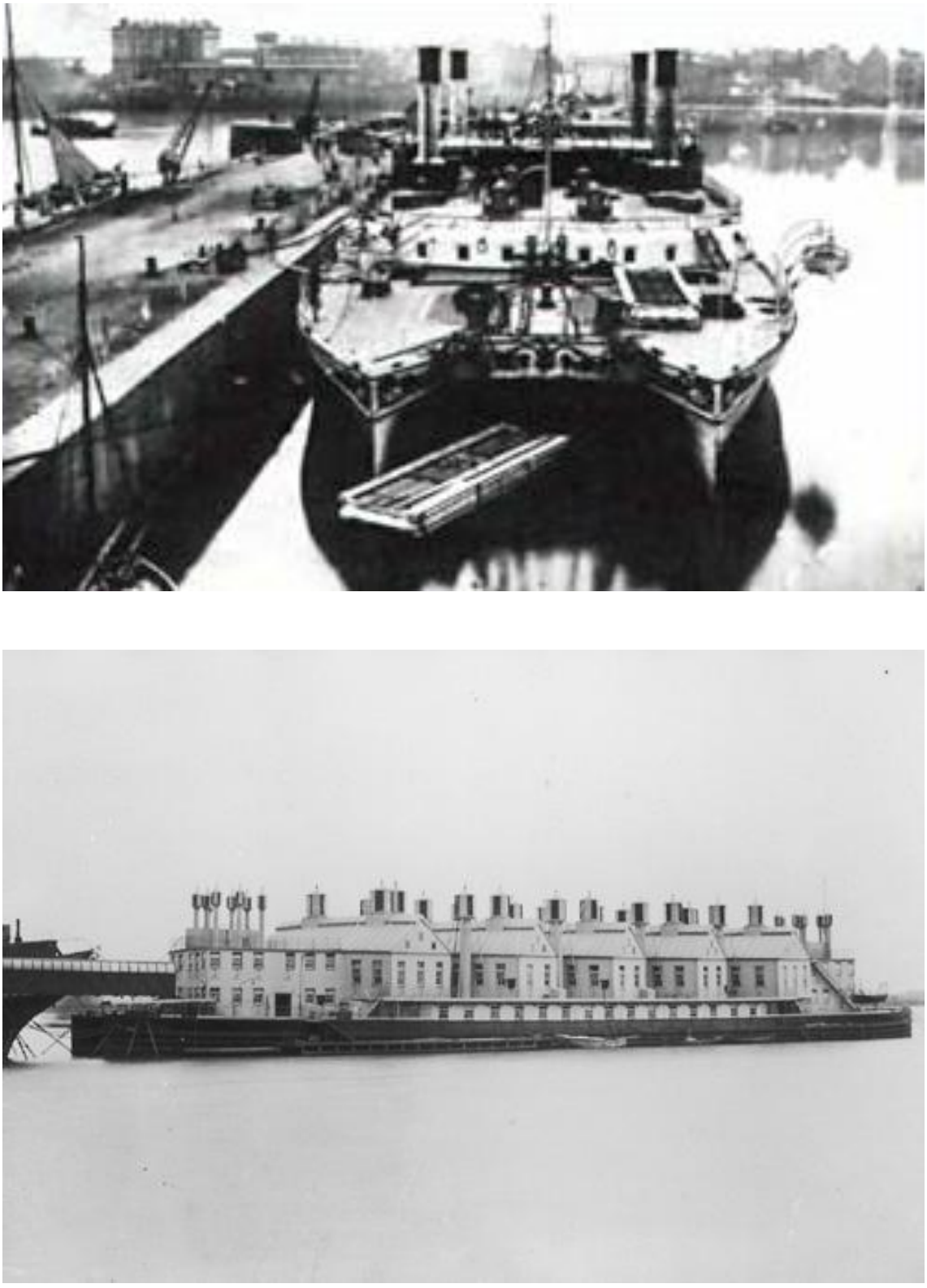


Figure 22. SS *Castalia* before (above) and after (below) conversion to a hospital ship

Source: Ayres G.M., *England's First State Hospitals, 1867-1930* (London: Wellcome Institute for the History of Medicine, 1971), p. 80.

5.5 From Social to Medical Authorities

Mechanical Explanations

In 1889 Payn commented on sea-sickness that it had existed 'ever since passenger-ships have been invented, why the boast march of Science should not have come up with such a very simple malady, and arrested it'.[171] Along with the common cold, he wrote, sea-sickness was a complaint that medicine had failed to tackle. Mid nineteenth-century understanding of sea-sickness, however, had been markedly different from knowledge of other diseases at this time, having no historical basis:

> The high and valuable information we used to derive in nearly all other disease, from the immortal ancient authors of medicine, is vainly looked for, with regard to the disease in question. We inherit from antiquity, no competent work on the subject. Neither Galen nor Hippocrates found it worth while to write upon or had no fit opportunity to study the subject.[172]

The most commonplace theories during the early and mid nineteenth century, as evidenced by the remedies and technical designs outlined, blamed the movement of the blood or organs within the body.

The earliest notable nineteenth-century medical publisher on sea-sickness was the chemist, physician and physiologist William Hyde Wollaston (1766-1828). In 1810, using the analogy of the action of mercury in a barometer when taken to sea, he argued that the condition arose from the mechanical motion of the ship, which influenced the movement of the blood upwards, putting pressure on the brain.[173] It was John Chapman, however, who popularised the vascular theory of sea-sickness during the late 1860s, when he claimed that sympathetic nerves caused the contraction and dilation of blood-vessels, creating undue congestion of the vessels of the spinal cord.[174] Chapman argued, as noted in Chapter Two, that he believed the centre for vomiting to be spinal, not

[171] Payn J., 'Our Note Book', *ILN* (10th August 1889), p. 166.
[172] Nelken M., *Sea-Sickness: Its Cause, Nature, Symptoms and Treatment* (New York: Stringer and Townsend, 1856), p. 25.
[173] Wollaston W.H., 'The Croonian Lecture', *Philosophical Transactions of the Royal Society of London* (1810) **100**, p. 8.
[174] Chapman J., *Sea-Sickness and How to Prevent It* (London: Trübner and Co., 1868).

encephalic, and thus congestion in the spinal circulation caused sickness.[175] His advice for the sufferer was either dry heat or cold on the back, which would assist in the circulation of blood. The editor of the influential magazine *Fortnightly Review* and 1860s science populariser, George Henry Lewes (1817-78), now best known as the partner of George Eliot, commented on how uncertain most medical theories were regarding sea-sickness, but that Chapman's views, having a theoretical basis and offering relief, were deserving of serious attention.[176] This opinion was also echoed by the reviewer for the *Edinburgh Medical Journal*.[177] Moreover, another reviewer recommended his readers obtain a copy of Chapman's work and that they 'give it a thorough attentive reading'.[178] Yet Chapman's theoretical arguments on neurophysiology actually gained little support from the medical community. It was his statistical success rates regarding the use of the ice bags, and his status as a physician, which meant his work received much publicity.[179]

In the 1870s Chapman's ascendancy was challenged by Alderson, who also believed the circulatory system was central in nausea and vomiting at sea.[180] His observations were primarily based on Wollaston's work, published sixty years previous, but reframed through modern ideas and research. He recommended that sufferers adopt the recumbent position, as this would mean pressure of the blood would have less effect on the brain.[181] However, though numerous commentators narrowed sea-sickness down to a dysfunction of the circulatory system, there was no consistent assertion of how this produced vomiting. For example, whilst many authors believed the problem to be an 'afflux' of blood in the vessels of the brain and spinal cord, also known as cerebral hyperaemia, others believed the opposite to be true.[182] An Edinburgh-educated physician Henry Naylor, for example, suggested that it was in fact produced by cerebral

[175] Chapman, *Sea-Sickness*, p. 55.
[176] Lewes G.H., 'Sea-Sickness: Its Nature and Treatment', *Fortnightly Review* (1st June 1865), p. 255.
[177] 'Review of: Sea-Sickness and How to Prevent It', *Edinburgh Medical Journal* (1869) **14:12**, pp. 1126-7.
[178] Mackay C., 'Dr. Chapman's Remedy for Sea-Sickness', *London Review of Politics, Society, Literature, Art and Science* (5th December 1868), p. 622.
[179] Lewes, 'Sea-Sickness', p. 256; Lawson H., 'Sea-Sickness', *Popular Science Review* (1869) **8:30**, p. 78.
[180] Alderson, *Observations on Sea-Sickness*; 'Obituary. Sir James Alderson', *BMJ* (16th September 1882), p. 545.
[181] Alderson, *Observations*, p. 15.
[182] See Rudd Leeson J., 'Nitrate of Amyl in Sea-Sickness', *Lancet* (27th July 1878), p. 120 and Dutton T., *Sea-Sickness (Cause, Treatment and Prevention): Voyaging for Health Resorts, A Concise, Practical Treatise*, 4th edn (London: Henry Kimpton, 1894).

anaemia.[183] His reasoning was that brandy and other stimulants relieved sickness, which it would not do in cases of cerebral congestion, and because of the common belief that lying down eased symptoms. A combination was also suggested. One anonymous *Lancet* contributor in 1879 claimed that sea-sickness was caused by sometimes too much blood in the brain, sometimes too little.[184]

Whilst blood movement was the earliest theory proposed by a medical authority, the most persistent medical and lay explanation at mid nineteenth was that motion disturbed the abdominal viscera. This was easily accepted because of the clear link between nausea and vomiting, and movement, and continued to be an explanatory factor throughout the century. In 1881 P.W.G. Nunn wrote in the *Lancet* that 'persons with pendulous and flaccid abdomens suffer as a rule more intensely from sea-sickness than others.'[185] How this caused the related symptoms, however, was not clear.[186] Some practitioners suggested that the intestines being pushed upwards by the rising and falling of the vessel in turn pressed the diaphragm against the abdomen.[187] Others hypothesised that the gastric mucosa were irritated, or that the liver was caused to discharge excessive bile.[188] Blood and gut movement theories were also combined. Robert Stevens of Kennington, in a letter to the *Lancet* in 1838, shared his belief that sea-sickness was caused by the loss of the muscles' knowledge of the body's relative position.[189] This then affected the sympathetic nervous system and its control of the circulatory system and 'functional power being withheld from the stomach, the diaphragm and abdominal muscles […] are called into action and produce vomiting'.[190]

Senses and Perception

It is clear that reflex theory came to play a key role in physiological explanations of sea-sickness, albeit often indirectly and later than the theory had come to dominate explanations for disease in wider medical practice. Even at the end of the nineteenth century, the specific site from which the irritation causing nausea and vomiting originated whilst at sea was far from clear. In addition to abdomen-based explanations,

[183] Naylor H., 'Sea-Sickness', *Lancet* (23rd August 1879), p. 276.
[184] 'Sea-Sickness' (1846), p. 390.
[185] Nunn, 'Sea-Sickness', p. 1037.
[186] 'Levilly's Thalaszone', p. 189.
[187] 'Nature and Treatment of Sea-Sickness', *Lancet* (3rd June 1843), p. 357.
[188] Reason and Brand, *Motion Sickness*, p. 5.
[189] Stevens R., 'Phenomena Connected with Sea-Sickness', *Lancet* (10th November 1838), p. 263.
[190] Stevens, 'Phenomena', p. 264.

came ideas of involvement of the senses. That they could play a role in sea-sickness was not a remarkable theory, given understandings of sensori-motor physiology that proved particularly popular towards the end of the nineteenth century. Indeed, sea-sickness was frequently considered to have an element of the senses and mind in its explanation.[191] Imagination, the thought of sea-sickness, the sound of hearing another vomit, and foul smells were believed throughout the century as having the potential to induce nausea and vomiting.[192]

Some, though few, medical authorities also implicated gendered characteristics.[193] A general explanation was that women's stomachs were more 'delicate', and susceptible to the reflex irritation that caused nausea and vomiting at sea.[194] Other medical authors were more specific: one naval surgeon wrote a memoir in the early 1840s arguing that sea-sickness could be attributed to fear. Females were affected by this before men, and children who were largely unaware of any danger were rarely ill.[195] More commonly, however, it was attributed to nerves. In the *Lancet* in 1878 their supposed essential nervousness led physician John Rudd Leeson (1854-1927) to observe that women suffered more particularly from nervous sea-sickness, whereas men experienced nausea and vomiting as a result of loaded stomachs and congested livers.[196] Later in the nineteenth century the United States' leading neurologist George Miller Beard (1839-83) claimed that his sickness remedy would work on 'the most sensitive and delicate ladies'; sickness affected the nervous most, and was least likely to affect 'the coarse, the phlegmatic, and the strong.'[197] In 1897 J.R. Stocker, in Thomas Clifford Allbutt's *A System of Medicine*, also agreed with Beard that those with a bilious temperament

[191] Marshall J., *Outlines of Physiology*, vol. 2 (London: Longmans, Green, and Co., 1867), p. 52.
[192] Carpenter W.B., *Principles of Human Physiology*, 5th American from the 4th and enlarged London edn (Philadelphia: Blanchard and Lea, 1853), p. 720; Stocker, 'Sea-Sickness', pp. 445-6; Stamp and Stamp, *Greenland Voyager*, p. 30. Early twentieth-century commentators complained that the role of imagination had been greatly exaggerated. See Norman Barnett H., *Sea-Sickness: Its True Cause and Cure* (London: Ballière, Tindall and Cox, 1907), p. 13.
[193] Stocker, 'Sea-Sickness', p. 446.
[194] Payn, 'Our Note Book' (October 1894), p. 522; 'Advertisements and Notices', *Liverpool Mercury* (3rd May 1844).
[195] 'Sea-Sickness', *MTG* (October-March 1843-4) **9**, p. 63. Gueprat's evidence was the case of an old sailor who never suffered from nausea and vomiting at sea, until he had been shipwrecked. The reporter on this memoir, M. Villeneuve, however, claimed that this argument was against many known facts and could not be supported.
[196] Rudd Leeson, 'Nitrate of Amyl', p. 120.
[197] Beard G.M, *A Practical Treatise on Sea-Sickness: Its Symptoms, Nature and Treatment*, enlarged edn (New York: E.B. Treat, 1881), p. vi and p. 14.

suffered more than the phlegmatic, and the nervous worse than the sanguine. [198] Americans, who were most nervous, suffered more than both sexes in England.[199]

Sensory disruption, however, in terms of a reflex response to perception of movement, was a more consistent explanation for sea-sickness. An anonymous *Lancet* contributor had summarised the action in 1843 as 'confusion in the brain respecting the laws of perspective, caused by constant motion'.[200] In particular, the involvement of sensory disruption helped to explain the sensations of giddiness and vertigo that often accompanied sickness. This theory gained more impetus in the second half of the nineteenth century, and was popularised particularly by Graily Hewitt. Hewitt, better known for his obstetrical work, stressed the significance of visual disturbance as playing a causal role in sea-sickness. His theory was based on the results achieved from a series of experiments completed in 1885 which aimed to imitate sea-sickness with complex visual disturbances. This involved using a six-foot mirror in a moveable frame and a chair placed five feet from the mirror. 'It was found', Hewitt published in the *BMJ*, 'that in some of the cases experimented on a feeling of giddiness ensued when the mirror, being hung at its centre, was oscillated from side to side for a quarter of an hour.'[201] He also placed the subject on a swing opposite the oscillating mirror in order to replicate the ship environment. He confirmed that by fixing the sight on an object far from the vessel, or by preventing all vision, sea-sickness could be prevented.

Hewitt's theories were reported in the popular *ILN*, Wilson supporting his physiological explanations as well as the recommendation for blocking out sensory perception of movement.[202] Following his article Wilson received at least two letters from readers who had engaged with the topic, encouraging him to publish on it again the following month.[203] In 1891 this explanation received further support when the theory of a foreign authority, the German physician Ottomar Rosenbach (1851-1907), who had conducted experiments for ten years, was publicised in the *BMJ*. He claimed that movement acted on the senses and disrupted the consciousness, creating a 'disturbed equilibrium.'[204] T.T. Reynolds, surgeon to the steamship *City of Chicago* (1884), similarly suggested

[198] Stocker, 'Sea-Sickness', p. 450. Stocker was a medical officer to the Board of Trade in Glasgow.
[199] Beard, *A Practical Treatise on Sea-Sickness*, p. 16; Stocker, 'Sea-Sickness', p. 446.
[200] 'Nature and Treatment of Sea-Sickness', p. 357.
[201] Hewitt G., 'Experiments on the Production of an Imitation of Sea Sickness by Complex Visual Disturbances', *BMJ* (21st May 1892), p. 1088.
[202] Wilson A., 'Science Jottings', *ILN* (4th June 1892), p. 702.
[203] Wilson A., 'Science Jottings', *ILN* (30th July 1892), p. 151.
[204] 'Sea Sickness', *BMJ* (25th July 1891), p. 193; Dutton, *Sea-Sickness*, pp. 7-8.

that when sensory impressions were involved they caused vomiting by interfering with the coordination of movements that adapted the body to its surroundings.[205]

Despite popular interest, theories that were based wholly on a disruption of sensory perception were difficult to support from a medical perspective when it was noted that blind persons still suffered from sea-sickness.[206] Hewitt, acknowledging this fact, conceded that visual disturbance could not be the exclusive cause, but a very prominent one.[207]

Authority, Statistics and Comparisons

It is evident that in the last decades of the nineteenth century there was little or no agreement amongst medial practitioners on the pathological site or sites that produced sea-sickness. However, it is also clear that the study of nausea and vomiting at sea was becoming increasingly standardised and seen as a complaint to be discussed and treated by medical professionals.

In 1880 the medical officers aboard the White Star Line *Germanic*, J. Fourness-Brice and F. Wilson, found their authority questioned when they had Beard as a passenger. Prior to the journey Beard had authored a pamphlet on sea-sickness entitled 'Oh My!' in which he stated that consulting ship surgeons was useless.[208] Without discussing it with either of the medical officers, he had written to the White Star Line's agent in New York and requested that the ship be stocked with bromides of sodium and potash, cannabis Indica pills and citrate of caffeine. During the first days of the journey, which were calm and free from sickness, Beard went around the passengers telling them that they should go directly to him when they began to feel ill. 'Armed with his favourite medicines and a hypodermic syringe he "went for" his fellow-passengers', Fourness-Brice wrote, 'with, I regret for their sakes to say, but indifferent success'.[209] The medical officers eventually drew the line when Beard sent a patient to them with a prescription that he had written.

[205] Reynolds T.T., 'On the Nature and Treatment of Sea-Sickness', *Lancet* (28th June 1884), p. 1161.
[206] 'Pathology of Sea-Sickness', *MTG* (October-March 1843-4) **9**, pp. 356-7.
[207] Hewitt, 'Experiments', p. 1090.
[208] Fourness-Brice J., 'Medical Etiquette on Board Ship', *BMJ* (7th August 1880), p. 238.
[209] Fourness-Brice, 'Medical Etiquette', p. 238.

Fourness-Brice's purpose for informing the *BMJ* of this event was to question medical etiquette on board ship, including the practice of experimenting on patients who were not technically under Beard's care.[210] In his response to the article Beard argued that the 'experiments have been made by myself, both on English and American steamers, whether provided with surgeons or not,' but that surgeons normally had no problem with his actions. Furthermore, he wrote: 'I had supposed – and I cannot be entirely wrong in this supposition, that surgeons dislike to deal in cases of sea-sickness; and it is said that the majority of sufferers have so little faith in medicine they do not think of asking the surgeon's aid'.[211] In conclusion he also claimed that he 'was experimenting, not practising, seeking to answer some minor questions relating to dosage and combinations'.[212]

For the contents of his book *A Practical Treatise on Sea-Sickness*, the first edition of which was published in 1880, Beard had frequently conducted experiments at sea.[213] He also claimed that his work on the nervous system had enabled him to solve the mystery of sea-sickness, which he argued was a functional disease of the central nervous system, entirely unrelated to the stomach, liver and other areas of the digestive system.[214] Physiologists and physicians had thought this because vomiting was the most prominent symptom, and it was automatically linked to the stomach. However, Beard claimed that rolling and pitching would principally affect the central nervous system, supported by the fact that vomiting was a common symptom of concussions of the brain: 'in sea-sickness there is a series of mild concussions.'[215] The treatment was bromide of sodium, which rendered the central nervous system less susceptible to disturbance caused by motion.[216]

The incident aboard the *Germanic* shows that the treatment of nausea and vomiting at sea was increasingly looked upon as belonging in the remit of a ship-surgeon, or, due to the toxicity of remedies, a previously-consulted physician. For example, in 1888 a letter from Watson Smith (1845-1920), a lecturer in Chemical Technology in Owen's College Manchester and editor of the *Journal of the Society of Chemical Industry*, was published

[210] Fourness-Brice, 'Medical Etiquette', p. 238.
[211] Beard G.M., 'The Treatment of Sea-Sickness: Its Relation to Medical Etiquette on Shipboard', *BMJ* (28th August 1880), p. 362.
[212] Beard, 'The Treatment of Sea-Sickness', p. 362.
[213] Beard, *A Practical Treatise on Sea-Sickness*, p. vi.
[214] Beard, *A Practical Treatise on Sea-Sickness*, p. 13.
[215] Beard, *A Practical Treatise on Sea-Sickness*, p. 14.
[216] Beard, *A Practical Treatise on Sea-Sickness*, p. 30.

in *The Times*. He presented information on a new artificial alkaloid named antipyrine – a type of painkiller – which was found to be a remedy for sickness at sea.[217] However, shortly after, a concerned physician wrote to the *Lancet* warning of its possible side-effects, writing that 'we must strongly protest against its indiscriminate employment without the supervision of a medical man.'[218] Furthermore, a debate ensued in the *Lancet* in 1893 over the proper use of a dangerous form of 'chlorobrom' (a fashionable remedy formed of a combination of chloralamide and potassium bromide).[219]

Beard's experiments, and those of Hewitt, represent the late nineteenth-century application of large-scale experiments and statistics to the investigation of nausea and vomiting at sea. Such practices were not new to naval medicine. Experimentation, the mass testing of remedies and concern with medical statistics are activities that have been identified by historians as occurring at sea prior to the nineteenth century. Mark Harrison, in his study of the treatment of fevers and tropical therapeutics in the period 1750-1830, argues that many cognitive and practical changes such as those listed prefigured Parisian clinical-anatomical medicine of the 1790s.[220] One treatise published in the late nineteenth century as a result of these methods proffered a markedly new physiological understanding of sea-sickness. It was considered by many to offer conclusive proof. However, the theory was not constructed solely on results of experiments at sea, or as a result of ships acting as laboratories. Rather, it was shaped by the author's knowledge of a comparable disease, a 'land-based' disease. Whilst the environment at sea therefore created a distinct medical culture for many illnesses, particularly tropical diseases, an explanation for sea-sickness was looked for by taking the symptoms out of their situational and spatial setting.

In 1881 John Arthur Irwin (1853-1912), late physician to the Manchester Southern Hospital, published his *Preliminary Observations on the Pathology of Sea-Sickness*,

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[217] Smith W., 'A New Remedy for Sea-Sickness', *The Times* (7th February 1888), p. 7.
[218] 'Antipyrin for Sea-Sickness', *Lancet* (18th February 1888), p. 338; Gillett Cory F., 'Sea Sickness', *BMJ* (6th August 1892), p. 329.
[219] For example: Charteris M., 'Sea-Sickness', *Lancet* (4th February 1893), p. 274; Napier Ledingham A., 'Chlorobrom in Sea-Sickness', *Lancet* (24th June 1893), pp. 1515-16; Robertson R.C., 'Chlorobrom in Sea-Sickness', *Lancet* (8th July 1893), p. 88.
[220] Harrison M., 'Disease and Medicine in the Armies of British India, 1750-1830: The Treatment of Fevers and the Emergence of Tropical Medicine', in Hudson G.L. (ed.), *British Military and Naval Medicine, 1600-1830* (Amsterdam, New York: Rodopi, 2007), pp. 87-119. This is also the argument made in Brockliss L. and Jones C., *The Medical World of Early Modern France* (Oxford: Clarendon Press, 1997) referenced in Hudson G.L., 'Introduction: British Military and Naval Medicine, 1600-1830', in Hudson, *British Military and Naval Medicine*, p. 9.

using nearly 4,000 recorded cases.[221] He asserted that he had found there to be a '*supplementary special sense* […] the function of which is to "determine the position of the head in space," and to govern and direct the aesthetiko-kinetic mechanism by which is maintained the equilibrium of the body.'[222] This faculty appeared to Irwin to be connected to the cerebellum and optic lobes, with its principal seat in the semicircular canals of the internal ear. Motion, he asserted, produced sickness by disturbing the endolymph in these semicircular canals.[223] The endolymph was free-flowing within the canals, and corresponded with the motion of the head, and therefore ship. When the motion suddenly changed direction, 'the endolymph continues to move on in the original direction until stopped by friction.'[224] The resulting pressure conveyed incorrect impressions to the sensorium, creating in-coordination and giddiness. The pathology of sea-sickness, Irwin wrote, was therefore 'irritative hyperaemia of the semicircular canals'.

Interest in this theory had been stimulated by prior knowledge of the comparable symptoms exhibited in Ménière's disease, to which Irwin drew similarities. This was a disorder affecting the inner ear, in particular the part known as the labyrinth, a system of fluid-filled channels which send signals of sound and balance to the brain. Ménière's disease caused the fluid in the labyrinth to build up, disrupting balance and hearing. Irwin felt that the similarity in symptoms between sea-sickness and this disease confirmed pathology of the labyrinth in cases of nausea and vomiting.[225]

Irwin's theory did not enjoy much support until after the Second World War when medical opinion moved towards it.[226] However, it stands in contrast to the many that had come before. The specific connection made between sea-sickness and labyrinthine vertigo, seen in Ménière's disease, brought sea-sickness in-line with wider medical knowledge and understanding of symptoms. Furthermore, in the late 1880s this argument was further strengthened by several investigations into the immunity of deaf-mutes to sea-sickness. These had been prompted by the studies of a Harvard-psychiatrist

[221] Irwin also published on the role of ship-surgeons, nursing, hydrotherapy and the influence of sea-voyaging on genito-uterine functions.
[222] Irwin J.A., *Preliminary Observations on the Pathology of Sea-Sickness* (London: Ballantyne, Hanson & Co., 1881), pp. 3-4.
[223] In addition to disturbing the abdominal viscera and possibly the brain and the fluid at its base. Irwin, *Preliminary Observations*, p. 4.
[224] Irwin, *Preliminary Observations*, p. 5.
[225] Irwin, *Preliminary Observations*, p. 6.
[226] Reason and Brand, *Motion Sickness*, p. 9.

William James (1842-1910) and Reynolds, who published in the early 1880s on the absence of sea-sickness in individuals with inner ear damage.[227] It was also supported by the growing belief that vomiting was controlled by a central mechanism, perhaps a vomiting centre within the brain, separating the symptoms further from mechanical movements of the abdominal viscera.[228] Momentarily looking into the twentieth century, and the importance of laboratory testing that occurred during the Second World War to confirm this theory, also highlights the difference in understanding that was encouraged by viewing sea-sickness out of isolation, as an illness only occurring at sea, and comparing it to conditions with similar symptoms.[229] In the nineteenth century, however, these methods did not result in therapeutic options, and there were no changes that could be characterised as an improvement for those experiencing nausea and vomiting at sea.

5.6 Conclusion

In the last decades of the nineteenth century, as with Irwin's hypothesis, many neurophysiologists observed that the symptoms of sea-sickness corresponded to those of Ménière's disease. Yet physiology texts demonstrate that whilst agreeing that the vomiting of Ménière's disease was of the same nature to the vomiting occurring at sea, there was no consensus on the exact nature of the irritation, or whether it was cerebral or peripheral.[230] Throughout the whole of the century then, nausea and vomiting at sea were framed in a variety of pathological explanations; their medical identity was destabilised, and separated from more general physiological explanations because the reason for their occurrence was clearly environmental, or situational, not internal. Whilst experiments evidently took place at sea, demonstrating how ships could be seen

[227] James W., 'Sense of Dizziness in Deaf-Mutes', *Mind* (1881) **23**, pp. 412-13; James W., 'The Sense of Dizziness in Deaf Mutes', *American Journal of Otology* (1882) **4**, pp. 239-54; Reynolds, 'On the Nature and Treatment of Sea-Sickness', pp. 1161-2. Support for the connection between sea-sickness and deaf-mutes was seen in several *Science* articles, including: 'Sea Sickness', *Science* (3rd June 1887), pp. 525-7 and Gallaudet E.M., 'Sea-Sickness', *Science* (10th June 1887), p. 560.

[228] Reynolds, 'On the Nature and Treatment of Sea-Sickness', p. 1161; Danvers, 'Sea-Sickness', p. 1295. The medulla oblongata, although named as the site of dysfunction causing sea-sickness by Marshall Hall in 1849, had been largely absent from physiological explanations of sea-sickness during the mid and late nineteenth century. Hall M., *On the Neck as a Medical Region, and on Trachelismus; on Hidden Seizures; on Paroxysmal Apoplexy, Paralysis, Mania, Syncope; &c*. (London: J. Mallett, 1849), p. 34.

[229] Reason and Brand, *Motion Sickness*, p. 9.

[230] Leftwich R.W., *An Index of Symptoms as an Aid to Diagnosis* (London: Smith, Elder, & Co., 1888), p. 105; Ewart W., *Symptoms and Physical Signs: A Formulatory for Clinical Note-Taking with Examples* (London: Ballière, Tindall and Cox, 1892), p. 81.

as laboratories, sea-sickness was deconstructed and explanations of its symptoms were looked for in comparable, 'land-based', illnesses.

Nausea and vomiting at sea were at once widely experienced universal symptoms, whilst also being engrained with individual bodily and mental significance. There is no single cultural or medical narrative. Knowledge, as experience, of the condition was also characterised by individuality, yet this knowledge was publicly shared and incorporated into common practices. Explanatory theories were also plural in nature, and built upon each other, rather than complying with any major medical trends.

The temporary nature of nausea and vomiting at sea can be seen to have dictated experiences and understandings. Medical knowledge was difficult to gain and confirm as experiments could only be made at sea, until experimental setups on land were constructed towards the end of the century. Yet, their transient nature also meant that explaining and treating nausea and vomiting at sea was not a matter of urgency. Even the worst of sufferers could eventually disregard these symptoms without medical intervention. Darwin, to his friend and mentor John Stevens Henslow (1796-1861), wrote in 1835: 'But now that I do clearly see England in the distance, I care for nothing, not even sea sickness.'[231] However, the memory of experiencing these symptoms was powerful and may have, by stopping Darwin returning to the oceans, allowed the theory of evolution by natural selection to be developed. For, in 1837 Darwin wrote to Henslow again that '[i]t appeared marvellously odd to see the little vessel [the Beagle] – and to think that I should not be one of the party. – If it was not for the sea sickness, I should have no objection to start again.'[232]

[231] Darwin to Henslow J.S., 10th-13th March 1835. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry272/ (letter no. 272; accessed 17th November 2011).
[232] Darwin to Henslow J.S., 28th May 1837. *Darwin Correspondence Project Database*, http://www.darwinproject.ac.uk/entry356/ (letter no. 356; accessed 17th November 2011).

CHAPTER SIX:
CONCLUSIONS

6.1 Introduction

The central research questions of this thesis are:

> How did medical understandings and management of nausea and vomiting change during the nineteenth century?
>
> How were nausea and vomiting experienced, interpreted and responded to by sufferers?

To address these questions I have structured my thesis around themes within histories of medical theory and practice, social responses to sickness, and sufferer experiences. I have addressed gaps in the existing historiography of health, illness and morbidity, and demonstrated the merits of using nausea and vomiting as a lens for their investigation.

In my research I have focussed on nausea and vomiting as signs, symptoms and sickness. As such, I have not investigated 'diseases' *per se*, nor conditions that in all cases would be regarded as 'illnesses'. Rather, I have looked at instances in which nausea and vomiting presented, and were often interpreted, as self-limiting conditions. This project has been challenging; not least because of the wide array of sources and issues, but also because of the fluidity of the concepts under investigation. However, it has also proven to be rewarding, due to the novelty of the topic, and because, from previously unexplored perspectives, it throws new light on central themes in the history of nineteenth-century medical theory and practice. As conclusions have been presented in each individual chapter I will not repeat them here, but rather draw out general findings of the thesis as a whole and reflect on how these inform the historiography of medicine in the nineteenth century. In addition, I set out opportunities for further research on the history of nausea and vomiting, including demonstrating how the case studies – morning sickness and sea-sickness – could be continued into the twentieth century.

6.2 General Findings

Medical Cosmologies

My investigation of nausea and vomiting in clinical practice supports both the value of the designation of nineteenth-century medical cosmologies as 'bedside', 'hospital', and 'laboratory', and shows how these were cumulative rather than successive frames. For example, while doctors made physiological investigations into the cause of nausea and vomiting, and microscopic investigations of vomited matters from the mid nineteenth century, these did not result in agreed, standardised interpretations, nor established criteria for the diagnosis of most patients. These findings sit in contrast to the cases of the major infectious diseases of the era, where historians have shown that new laboratory techniques proved to be reliable diagnostic tools and correlated findings with specific disorders, though these were only slowly adopted and routinised.[1] I have shown that whilst there was interest in gaining 'objective' knowledge of illnesses, using vomited matters as pathological fluids worthy of analysis in the mid to late nineteenth century, methods of qualitative analysis of vomited matters were not displaced; indeed, quantitative techniques largely complemented qualitative analyses. In Chapters Two and Three, in my narratives of common signs and symptoms, I identified new evidence for the view that medical cosmologies were, as John Pickstone writes, 'concurrent and overlapping modes of work'.[2]

More specifically, this research confirms that there was a persistence of hospital-style medicine into the twentieth century, whereby the linkage between clinical symptoms and organic disorder was the dominant and supported method of understanding and diagnosing disease.[3] The task of distinguishing between different types of reflex vomiting (local, central, and peripheral) relied on clinical judgements that were held in esteem throughout the nineteenth century. Diagnoses depended on the physician's senses and acumen well after the alleged 'laboratory revolution' in medicine.[4] Continuities were also shown in therapeutic choices; the use of emetics and anti-emetics

[1] Cholera, malaria, anthrax, tuberculosis. This is highlighted by the swift proliferation of bacteriological laboratories in the 1890s and 1900s, and the use of these analyses in case reports.
[2] Pickstone J.V., 'Working Knowledges Before and After Circa 1800: Practices and Disciplines in the History of Science, Technology and Medicine', *Isis* (1993) **98**, p. 493.
[3] Cunningham A. and Williams P., 'Introduction', in Cunningham A. and Williams P. (eds), *The Laboratory Revolution in Medicine* (Cambridge: Cambridge University Press, 1992), p. 11.
[4] Lawrence C., 'Incommunicable Knowledge: Science, Technology and the Clinical Art in Britain, 1850-1914', *Journal of Contemporary History* (1985) **20:4**, pp. 503-20.

in vomiting conditions showed the centrality of managing symptoms as much as, if not more than, countering causes. Drugs that worked to this effect were not administered so that they might remove the causes of nausea and vomiting, but merely to ease or prevent these specific symptoms. This finding emphasises the need for historians to think about 'treatment', in the context of nineteenth-century knowledge and practice, as being about many things, for example 'managing the patient', easing symptoms, encouraging symptoms, palliation and building bodily strength. Furthermore, despite the influence of reflex theory and interest during the 1870s in the action of drugs on the excito-motor system, understandings of the action of emetics and anti-emetics remained complex and fluid. The humoral benefits of vomiting were reworked to conform to nervous and mechanical explanations.

Whilst there were continuities in diagnostic and therapeutic practices, physiological and pathological explanations for nausea and vomiting did follow, at a general level, a reductionist path, reflecting a shift to anatomical specificity and physiological reductionism. From the stomach, to the nervous system, to a possible vomiting centre within the medulla oblongata, the source of symptoms was increasingly localised. Yet these shifts had minimal practical impact. Physiological assertions regarding the origin of nausea and vomiting were contested, and the nature and function of these symptoms varied according to type of illness. Furthermore, whilst the nineteenth century has been seen as a time of growing medical specialisms, this thesis demonstrates the importance of analytical investigation of symptoms that were not restricted by intra-professional boundaries. Nausea and vomiting were witnessed across all medical disciplines, and were intriguing conditions for their physiological and pathological meanings as well as the relations between these approaches.

Morbidity and Everyday Medicine

Nausea and vomiting were notoriously difficult to interpret and treat in the nineteenth century. The skill of a practitioner was tested by them and there were a multiplicity of possible responses. My research has therefore revealed how problematic diagnosing and treating everyday sickness was in this period. Arguably, medical theory and practice was challenged more by morbidity than it was by mortality, not least because with the latter post mortems were increasingly used to inform clinical work and provide 'objective' knowledge. Whilst nineteenth-century practitioners only engaged

sporadically with the major epidemic diseases that have so preoccupied historians, they faced a daily battle with the management of common illnesses. To understand fully how medical knowledge and management of bodily dysfunction was established, my research shows the need for historians to give far greater attention to minor and transient episodes of illness. Although historians have been encouraged to undertake such studies, most famously by Roy Porter and his call for 'Medical History from Below', few have taken up the challenge.[5]

Further to examining the role of nausea and vomiting in physicians' cognitive practices, in Chapters Four and Five I discussed 'being sick' as a complex, everyday, and often individualised encounter. The experience of nausea and vomiting shaped perceptions of the self and the body. In Chapter Five in particular, I demonstrated how nausea and vomiting influenced thoughts and emotions. George Beard wrote in 1881 that '[m]any of the greatest minds of the world have been upon the ocean, but how few great thoughts have been conceived at sea. Men of the highest genius seem to be transformed as soon as they get at a distance from land in a rolling ship.'[6] Although Beard was referring specifically to sea-sickness, the same sentiment could easily be expressed for the majority of illnesses presenting with nausea and vomiting. The physical effect that these ordinary conditions had on the body influenced ideas and decision-making.

In my analysis of the psychophysiology of vomiting in Chapter Two I also showed how 'sickness of the mind' was believed to cause sickness of the body, and how contemporary notions of sensibility were exemplified in hysterical vomiting. These findings therefore contribute to Janet Browne's work demonstrating the interconnectedness of health and intellect, as exemplified by Darwin's 'life of the shawl'.[7] This research also informs histories of the stomach and gastric conditions, confirming that they held a central cultural position, and that they demonstrate, as Bruce Haley has studied, how dominant the concept of '[t]otal health or wholeness – *mens sana in corpore sano'* was to Victorians.[8]

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[5] Condrau F., 'The Patient's View Meets the Clinical Gaze', *SHM* (2007) **20:3**, pp. 525-40.
[6] Beard G.M, *A Practical Treatise on Sea-Sickness: Its Symptoms, Nature and Treatment*, enlarged edn (New York: E.B. Treat, 1881), p. 26.
[7] Browne J., 'I Could have Retched All Night: Charles Darwin and His Body', in Lawrence C. and Shapin S. (eds), *Science Incarnate: Historical Embodiments of Natural Knowledge* (Chicago and London: University of Chicago Press, 1998), pp. 240-87.
[8] Haley B., *The Healthy Body and Victorian Culture* (Cambridge, Massachusetts and London: Harvard University Press, 1978), p. 4.

Sickness and Health, Abnormality and Normality

Perceptions of sickness and health, or normality and abnormality, rather than their simple occurrence, are also illuminated in this thesis. Though my sources have not been patient-centred exclusively, the combination of accounts and responses to sickness from both sufferer and doctors has illuminated lay and medical perceptions of nausea and vomiting. My work confirms the complexity and fluidity of often taken-for-granted terms such as: 'patient', 'sufferer', 'disease', 'illness' and even 'sign' and 'symptom'. Nausea and vomiting were inherently paradoxical. Whilst distressing, vomiting was historically considered as healthy (purging excess humors), or a protective response to an irritant. Although signs and symptoms in general could be considered functional in respect to their role in alerting individuals to a problem, nausea and vomiting in particular revealed their complexity as both experiences of bodily change or adaption, and as indicators of morbidity or pathology. Furthermore, as signifiers of change, nausea and vomiting were not necessarily perceived as morbid, and as physical and sensational occurrences they were not always interpreted as cause for concern. As discussed in Chapter Two, the continued use of vomiting as a treatment is evidence of this.

This complexity of comprehension can be attributed, to some extent, to variations in expert and lay knowledge and understandings, most clearly exhibited in responses to morning sickness. Although lay and medical spheres shared many ideas, and there were continuities in responses to nausea and vomiting across a spectrum of commentators, in Chapter Four I demonstrated how the contraindicative nature of nausea and vomiting at times helped to shape competing notions about whether pregnancy vomiting was helpful or harmful. Some physicians, gynaecologists and obstetricians discussed pregnancy vomiting as though it were an unnecessary accompaniment to pregnancy. However, I have shown that medical explanations of the pathological character of nausea and vomiting only minimally impacted on notions of health during pregnancy.

Lay perceptions clearly contributed to medical understandings of morning sickness. In the first instance, women with access to doctors themselves made a judgement as to whether they wanted, or needed, medical intervention, or to position themselves within a 'sick-role'; women were therefore active agents in their response to morning sickness. I have also questioned the role which physicians chose, or were allowed, to play in the

control or evaluation of the condition. In so doing I have demonstrated that the framing of nausea and vomiting in pregnancy as positive resulted from a type of 'negotiation' between women and doctors. Cultural and medical interpretations were often co-constituted by professional and lay spheres, with many medical beliefs regarding morning sickness as normal being formed on the basis of traditions and experiences.

Levels of normal and abnormal vomiting in pregnancy were established by practitioners towards the end of the nineteenth century, as evident by the naming and shaping of *Hyperemesis Gravidarum*. This disease category made the harmless, if uncomfortable, pregnancy vomiting paradoxically more normal. Ann Oakley's assertion that pregnancy was medicalised as *natural* throughout the nineteenth and into the twentieth century is, therefore, questionable.[9] Rather, morning sickness was *normalised*. Yet it also continued to be an individually assessed and experienced condition. Neither did doctors' naming and treating the condition have the effect of positioning women who suffered the condition as frail. Their definition of morning sickness remained ambiguous and there was no therapeutic response. Doctors' interest can therefore chiefly be seen as a by-product of the prominence of the condition, and the uncertainties around its physiological cause.

In contrast to 'normality' commonly meaning to be judged as being 'well', in the case of nausea and vomiting during pregnancy 'being sick' meant to be 'healthy'. Also, the idea of a medically-defined 'natural pregnancy' involved an inherent weakness; the designation of nausea and vomiting as normal invoked the concepts of health and strength, negating the need for medical intervention. My history of nausea and vomiting reveals, therefore, that medical responses to an everyday condition did not necessarily place women in 'a biological straitjacket'.

Although connected only by their presentation of nausea and vomiting as defining features, parallels can be drawn between morning sickness and sea-sickness. This link was particularly clear with the themes of normality and abnormality. I have shown that pregnancy vomiting was predominantly perceived as normal, despite vomiting being a sign of disorder and disease in other conditions. It is possible to say the same of sea-sickness. Its incidence amongst sea farers was high; it was well-known and expected by

[9] Oakley A., *The Captured Womb: A History of the Medical Care of Pregnant Women* (Oxford: Basil Blackwell Publisher Ltd., 1984), p. 12.

those who had travelled before and those who had not. In this respect, my research has shown that Victorian tacit knowledge assumed nausea and vomiting at sea were entirely normal. The condition was brought on because the body was acclimatised, or adapted, to land. Nausea and vomiting at sea were, therefore, normal reactions to an abnormal environment. I have therefore shown that 'good health', even in the face of nausea and vomiting, was context-dependent and subjective, and based on a variety and combination of cultural expectations, medical theory and practical options.

Nausea and Vomiting as Allied Symptoms

As a final conclusion I draw attention to the approach which I have taken in this thesis, namely the discussion of nausea and vomiting as allied symptoms. Whilst nausea and vomiting were, and are, frequently allied, their association was not constant. As outlined in Chapter Two, their connection was physiologically complex. Diagnostic textbooks, when mentioning nausea, often presented it merely as a precursor or concomitant to vomiting, and explanations for it were highly varied. The value of nausea and vomiting to medical practitioners also differed. When practitioners were confronted with pathologies of the stomach, vomiting was a prime indication, and the most useful tool in diagnostic and therapeutic choices. In comparison, nausea was of little diagnostic value, because it was a sensation that was difficult to localise and analyse. Its occurrence was only given more significance when stomach-based pathologies were unclear, particularly as medical attention shifted in the late nineteenth century to an origin of these symptoms within the brain. The question of the physiological connection between nausea and vomiting was unresolved at the end of the nineteenth century.

The meanings of nausea and vomiting in sickness also varied significantly, as much as the medical values attributed to their occurrence. Meanings were frequently dependent on the narrator, be they a medical practitioner or sufferer. For example, nausea was often demoted within the medical sphere and vomiting seen as the cause for concern. In stark contrast, for sufferers the sensation of nausea was the principal and most distressing experience. I have revealed this most clearly in Chapter Five, through responses to sea-sickness. However, taken as a whole, literature on these signs and symptoms over the entire nineteenth century was consistent. 'Feeling sick', referring generally to feeling nauseous, was as prominent a complaint as actually 'being sick'. As

such, I have demonstrated that physical evidence of illness represents only a small margin of experiences of sickness during the nineteenth century.

6.3 Further Research

Nausea, Vomiting and Diarrhoea in the Nineteenth Century

In addition to the case-studies I examined, vomiting is also a serious feature of meningitis, encephalitis and ear infections, which remain largely unstudied by medical historians, and would benefit extensive research. Furthermore, in this study it has been necessary to exclude a number of health and illness categories on the basis that nausea and vomiting were not the principal or sole signs and symptoms. Further work on my themes in the nineteenth century could profitably look at 'upsets' of the whole digestive system, i.e. nausea, vomiting and diarrhoea, particularly as there were many reports in which they were linked. Statistics for in-patients admitted to St Thomas's and St Bartholomew's Hospitals in the late nineteenth century illustrate this, as patients were categorised as suffering from either 'vomiting', or 'diarrhoea and vomiting'.[10] Anne Hardy's future book on the history of food poisoning will be invaluable to anyone taking this forward. A study of vomiting and diarrhoea would also open up potential for the research of these symptoms as features of infectious disease, most significantly cholera.

The benefits of widening the scope away from everyday illnesses and including diarrhoea would also be as an avenue for the introduction of themes such as disgust and fear: Richard Evans writes that '[t]here could be few more violent affronts to Victorian prudery than the grossly physical symptoms of a cholera attack'.[11] In his investigation of tuberculosis in nineteenth-century France, David Barnes recognises fears that spitting could encourage the spread of disease. He also, following the work of Norbert Elias and Alain Corbin, examines notions of disgust that were incorporated into antituberculosis campaigns, namely 'unpleasant smells, the "promiscuous" crowding together of bodies,

[10] See for example: Champneys F.H. and Harrison Cripps W., 'Statistical Tables of the Patients under Treatment in the Wards of St. Bartholomew's Hospital during 1879', *Saint Bartholomew's Hospital Reports* (1880) **16**, p. 8 and Russell A.E., 'Medical Report. 1897', *Saint Thomas's Hospital Reports* (1898) **26**, p. 214.
[11] Evans R.J., 'Epidemics and Revolutions: Cholera in Nineteenth-Century Europe', *Past and Present* (1988) **120**, p. 127.

and bodily fluids and excreta.'[12] These studies would provide a useful framework for analysis of medical and public attitudes towards vomiting.

Psychosomatic Pregnancy Vomiting in the Early Twentieth Century

The twentieth century saw the recognition and creation of a number of conditions structured on nausea and vomiting, including cyclic vomiting syndrome and bulimia.[13] Research into any of these conditions would, I am sure, reveal continuities with my history of nausea and vomiting. However, preliminary research has also demonstrated that complex changes continued to be exhibited in the histories of the case studies that I have included within this thesis. Indeed, J.M.H. Martin's 1892 dissertation, entitled *Hyperemesis Gravidarum*, was not only noteworthy for its scientific nomenclature. Martin also explicated a theory of causality which was to be representative of early twentieth-century understandings of nausea and vomiting in pregnancy. He suggested that '*hysteria*, by prolonging and aggravating a symptom of little moment originally, and which has a natural tendency to subside, is the great cause of the persistent vomiting in pregnancy.'[14] In 1891 R. Kaltenbach, a much-cited German physician, allied *Hyperemesis Gravidarum* directly to hysteria, contending that they were both types of neurosis. He strongly implicated psychological factors in the former's prognosis and treatment.[15] Kaltenbach also suggested that women who suffered the severest form of vomiting were expressing abhorrence to their pregnancy, and a

[12] Barnes D.S., *The Making of a Social Disease: Tuberculosis in Nineteenth-Century France* (Berkeley: University of California Press, 1995), p. 84. See also: Elias N., *The Civilizing Process: The History of Manners and State Formation and Civilisation*, Jephcott E. (trans.) (Oxford: Blackwell, 1994); Corbin A., *The Foul and the Fragrant: Odor and the French Social Imagination* (Leamington Spa: Berg, 1986); Jenner M., 'Civilization and Deodorization? Smell in Early Modern English Culture', in Burke P., Harrison B. and Slack P. (eds), *Civil Histories: Essays Presented to Sir Keith Thomas* (Oxford: Oxford University Press, 2000), pp. 127-44.

[13] On bulimia see Parry-Jones B. and Parry-Jones W.L., 'Bulimia: An Archival Review of Its History in Psychosomatic Medicine', *IJED* (1991) **10:2**, pp. 129-43 and Parry-Jones B. and Parry-Jones W.L., 'Self-Mutilation in Four Historical Cases of Bulimia', *British Journal of Psychiatry* (1993) **163**, pp. 394-402. References to a condition named 'cyclic vomiting syndrome' appear in the *BMJ* and *Lancet* in the early twentieth century. Samuel Gee (1839-1911), however, is credited with the earliest English-language description of the condition. See Gee S.J., 'On Fitful or Recurrent Vomiting', *Saint Bartholomew's Hospital Reports* (1882) **18**, pp. 1-6. It has been suggested that Charles Darwin suffered from this condition – Hayman J.A., 'Darwin's Illness Revisited', *BMJ* (13th December 2009), pp. 1413-15.

[14] Martin J.M.H., *Hyperemesis Gravidarum, with Reference to its Etiology and Treatment* (Manchester: Examiner Printing Works, 1892), p. 28.

[15] Kaltenbach R., 'Ueber Hyperemesis Gravidarum', *Ztschr Gebutsch U Gynak* (1891) **21**, p. 200. Citation taken from Buckwalter G.J. and Simpson S.W., 'Psychological Factors in the Etiology and Treatment of Severe Nausea and Vomiting during Pregnancy', *American Journal of Obstetrics and Gynecology* (2002) **186:5**, pp. 210-14.

loathing of their husband and child.[16] The popularity of such views continued to increase into the early twentieth century. In 1905 a review in the *Journal of Obstetrics and Gynaecology* stated that

> Kaltenbach and other recent writers would consider that the mere performance of so small an operation as elevating a displaced gravid uterus acts, not as much by directly removing the cause in producing a cure of vomiting, but by "suggestion," on the hypothesis that hysteria is really at the bottom of the condition.[17]

Psychological explanations for disease were increasingly fashionable during the early twentieth century. They were mapped onto severe pregnancy vomiting, as a condition which did not affect all women, with interesting therapeutic suggestions. In the 1930s Harold Benge Atlee (1890-1978), a controversial Canadian obstetrician, attempted to demonstrate that pernicious vomiting of pregnancy was a neurotic manifestation. He recommended a treatment that involved removing women from their friends and family, denying them a vomit-bowl, and forcing them to consume a full hospital diet. Atlee assured women 'very dogmatically that they are going to stop vomiting at once, and that they will leave the hospital perfectly well in a week.'[18]

At the same time toxaemias also received much attention as causes of pregnancy vomiting, being detected as changes in urine and pathologies of the liver and kidneys.[19] Pursuing this case study would demonstrate the continuing complexity of a much contested topic within medicine and health, for which there was a seemingly endless supply of causal, and competing, explanations. Furthermore, it would contribute directly to Oakley's assertion in *The Captured Womb* that pregnancy was distinguished in the twentieth century as a specialist, technical matter under the authority of experts, rather than a social behaviour. I suggest that such a study would benefit from an international perspective, allowing for a

[16] Wesson N., *Morning Sickness: A Comprehensive Guide to the Causes and Treatments* (London: Vermilion, 1997), p. 55.
[17] Stevens T.G., 'Critical Review: Hyperemesis Gravidarum', *Journal of Obstetrics and Gynaecology* (1905) **7:4**, p. 267.
[18] Atlee H.B., 'Pernicious Vomiting of Pregnancy', *Journal of Obstetrics and Gynecology* (1934) **41**, p. 757.
[19] BiSoDol Company, *Vomiting of Pregnancy: A Symposium of the Current Literature* (New Haven, Connecticut: BiSoDol Company, 1932).

comparative examination of regulatory processes and technologies for assessing, diagnosing and monitoring sufferers.

Wartime Motion Sickness

The value and meaning of nausea and vomiting at sea also changed in the twentieth century, prompted by wartime needs. For example, during the Second World War a Sub-Committee on Airborne Troops was created by the British government, which co-ordinated with the Air-Sickness Committee of the Flying Personnel Research Committee.[20] Together with the Military Personnel Research Committee its aim was to find a means of combating motion sickness, including sea-sickness and air-sickness in airborne gliders and aeroplanes. On request the Neurological Research Unit at the National Hospital equipped laboratories for the purpose of determining the physiological mechanism of sickness (connecting it to the labyrinth), and used both mechanical tests (the swing), and drug trials in the field.[21] At the National Institute for Medical Research in Hampstead similar swing experiments were conducted that involved subjects swallowing a balloon that was attached to a recording device.[22] The swing was moved violently, and loud noises made while their subjects' stomach contractions were counted. Researchers claimed on the basis of these experiments that individuals without aural labyrinths were not susceptible to sickness.

In many ways these actions and responses to sickness – experiments with drugs and mechanisms such as the swing – can be seen as a continuation of nineteenth-century trends. However, wartime needs drove the necessity of such trials as during peacetime men could be habituated to motion gradually, or removed entirely from that service. Moreover, the problem was increasingly urgent when the ability of crews was shown to suffer. Questions of crew comforts, training and wastage arose at various stages, and during times of conflict sea-sickness in assault craft was a particular concern. Previous experience had taught 'how disabling sea-sickness can be to troops taking part in such landings'; it compromised 'the fighting efficiency of troops when disembarked on

[20] Committee of Privy Council for Medical Research, *Medical Research in War, Report of the Medical Research Council for the Years 1939-45 (7335)* (London: HMSO, 1948), p. 138.
[21] Committee of Privy Council, *Medical Research in War,* p. 139.
[22] Holling H.E., 'Wartime Investigations into Sea- and Airsickness', *British Medical Bulletin* (1947) **5:1**, pp. 46-9.

beaches.'[23] 'Airsickness suspensions' also became a matter of concern, and necessitated discussion of the selection of air-borne troops and Royal Air Force bomber crews on the basis of their liability to motion sickness.[24]

It was clear to medical and military investigators that extensive measures had to be taken. As mechanistically-induced sickness was not considered by some to be an accurate reflection of true sea-sickness, experiments were conducted in the field. In 1941 seventy men were taken to sea in Falmouth during rough weather, having been administered a variety of drugs. Sickness was judged

> mainly on a man's own statement, but was usually confirmed either by seeing him vomit or noting his haggard look and greenish pallor, for the observers quickly became skilled at recognizing the early signs of seasickness. Nauseated subjects were included as sick because, on short cross-channel trips, nausea alone might be just as incapacitating as vomiting.[25]

Experiments were extensive. In 1945 the results of experimentations carried out using 5,340 British and Indian troops off the west coast of India were published in the *BMJ*, examining sea-sickness specifically in the Tropics.[26]

A clear benefit of extending the study of nausea and vomiting into the twentieth century would be the incorporation of the influence of political and social needs. Furthermore, during wartime experiments the relationship between sea- and air-sickness was investigated, in order to determine whether a soldier could be susceptible to one and not the other.[27] Comparison between these two conditions would establish the basis for a rich history of 'motion sickness' more generally. It would also be possible to investigate

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[23] Hill I.G.W. and Guest A.I., 'Prevention of Sea-Sickness in Assault Craft: A Report of Experiments under Tropical Conditions', *BMJ* (7th July 1945), pp. 6-11.
[24] Committee for Privy Council, *Medical Research in War*, p. 238; 23rd September 1944, Figures for medical and other wastage air crew training, AIR 1/8634, TNA; 27th September 1944, Wastage from airsickness in the RAF, AIR 1/8634, TNA.
[25] Holling, 'Wartime Investigations', p. 48. Much work has been done on wartime experimentations which would contextualise these studies. See Sturdy S., 'War as Experiment: Physiology, Innovation and Administration in Britain, 1914-1918', in Cooter R., Harrison M. and Sturdy S. (eds), *War, Medicine and Modernity* (Stroud: Sutton Publishing Ltd., 1998), pp. 65-84; Lederer S.E., 'Military Personnel as Research Subjects', in Reich W.T. (ed.), *Encyclopedia of Bioethics* (New York: Simon & Schuster Macmillan, 1995), pp. 1774-6; Reilly E. *Civilians and Soldiers: The British Male Military Body during World War II*, Unpublished PhD Thesis (University of Strathclyde, 2010).
[26] Hill and Guest, 'Prevention of Sea-Sickness in Assault Craft', pp. 6-11.
[27] Holling, 'Wartime Investigations', p. 46. For a pre-WW2 discussion of air-sickness see Anderson A.G., *The Medical and Surgical Aspects of Aviation* (London: Henry Frowde, 1919).

how sickness was judged in experimentations, and the role of standardising these symptoms for such a purpose. Finally, the air ministry emerged as post-war experts on motion sickness, and an examination of how their knowledge was then translated and incorporated into approaches to common, civilian sea-sickness would give insight into the comparative significance of civilian and troop health.

6.4 Concluding Remarks

In *Making Sense of Illness*, Robert Aronowitz writes that

> There is no self-evident boundary between the specific, objective, and pathological, on the one hand, and the holistic, subjective, and experiential, on the other. The distinction is necessarily an oversimplification of a more complex and nuanced reality in which elements of both ways of thinking about and perceiving diseases are present.[28]

In this thesis I have used nausea and vomiting to demonstrate the interrelation and overlapping of these concepts in the diagnosis, treatment and experience of illness during the nineteenth century. I have shown that investigation of the meanings of nausea and vomiting in medicine is a richer vein for historians than has been previously recognised. In so doing I have questioned the 'universality of symptoms', and demonstrated how signs and symptoms, particularly self-limiting and frequently harmless nausea and vomiting, were engrained in cultural beliefs, as well as medical discourses. Experiencing these symptoms shaped perceptions of well-being and structured everyday interactions with medicine and medical practitioners.

This project was large and complex; the potential for a history of nausea and vomiting was vast. Although I have not investigated 'diseases' as such, nor even necessarily 'illnesses', the occurrence of nausea and vomiting as self-limiting conditions and their interpretation as signs and symptoms means that this is a contribution to the history of disease. The extent to which nausea and vomiting appeared in medicine and society was both a benefit and a hindrance in this research. Whilst the task of prioritising themes and sources from an immeasurable selection has been challenging, the results constitute

[28] Aronowitz R., *Making Sense of Illness: Science, Society, and Disease* (Cambridge: Cambridge University Press, 1998), p. 10.

a varied history on a number of previously un-researched topics. I have therefore contributed to historical knowledge in the form of two rich and complex case studies and two narratives of nausea and vomiting in nineteenth-century medical theory and practice, in addition to the general findings outlined in this conclusion.

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