Making Anatomical Knowledge about Disease in Late Georgian Britain, from Dissection Table to the Printed Book and Beyond: Matthew Baillie's *Morbid Anatomy* and Its Accompanying Engravings

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The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

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Thesis Abstract

The thesis examines the practice of morbid anatomy as it was articulated and developed in late Georgian Britain. This practice, I argue, was a particular way of investigating disease that was specifically anatomical, in contrast to much other work on disease in this period. It originated in William Hunter's anatomy school at Great Windmill Street, and was developed partly by Hunter himself but especially through the work and publications of Matthew Baillie. At the school, Baillie learnt anatomy in the Hunterian manner, and applied these lessons to the study of disease. His major publications *Morbid Anatomy* (1793) and *A Series of Engravings* (1799–1803) clarified and promoted this practice to a wider public in text and image, and were widely circulated. In the nineteenth century, morbid anatomy came to be central to British approaches in the study of disease, distinct from the historiographically much better-known, concurrent developments in Paris. By focusing on morbid anatomy, I argue that Paris's "birth of the clinic" was part of a wider story which had an important, and distinctive, British component.

My interpretation of Baillie's texts and activities incorporates approaches from the history of medicine, art history, and book history, thereby treating all of the various knowledge-making practices involved as vital to the development of morbid anatomy. Processes of dissection and preservation were designed to gain sensory knowledge of the diseased cadaver, and to keep that knowledge in the form of preparations; features of anatomy books were employed to present disease as anatomical; skilled artisans worked to enhance the epistemic content of Baillie's morbid anatomy illustrations; and after criticism, Baillie modified his work to mollify his critics whilst restating the essentially anatomical nature of his work. Baillie's work thus spanned various medical, publishing, and artistic concerns, and I explore morbid anatomy in the same way.

Contents

List of Figures

Introduction: Understanding Disease Anatomically

Early in 1789 a girl of around twelve years old died, and her corpse became valuable. Soon, her body was at the anatomy school in Great Windmill Street, having been likely stolen and sold by the notorious bodysnatchers. There, in the dissection room, the body was dissected, probably by an assistant to the proprietor as part of an anatomical demonstration to students of the female organs of generation. That was when a discovery in the body was made that transformed the pedagogical procedure into an opportunity: the cadaver was found to have an unusual structural formation of the right ovary. Investigation followed, now by one of the school's owners, Matthew Baillie—the finding might be significant. He began his investigation by examining the ovary visually, seeing it was "about the size of a hen's egg", and then by touch, finding it "doughy". Then he cut into it with a knife, finding "an apparently fatty mass, intermixed with hair and an excrescence of bone". Baillie was "startled"; this was significant.

More detailed examination followed. Baillie made notes on the length of the hairs, the colour of the fat, and the appearance of the bone. He compared the bone to teeth, and the hair to the hair on the corpse's head. Experiments were made with the fatty mass: Baillie noted that the substance would melt into paper when heated, and when that infused paper was burnt, it did so with "considerable crackling". Baillie also noted the circumstances that surrounded the unusual ovary. These were largely as expected, though the uterus and left ovary were smaller than was typical, indicating that the child had not entered puberty prior to her death.[1] To Baillie, all of this was suggestive.

But before Baillie could consider these appearances further, he had another procedure to undertake: preservation. Preservation halted the corpse's decay and would allow Baillie to keep the part permanently. Baillie had inherited a substantial collection of anatomical preparations—body parts suspended in preservative liquid in jars—from his uncle and predecessor William Hunter, and was always concerned with expanding that collection, especially with preparations showing unusual and diseased appearances. This appearance fitted that category very well, and so Baillie now had to make a number of decisions regarding its preservation. How much should he keep? Enough to allow the identification of the unusual structure in the wider context of the body, or just the unusual part? There were practical concerns here: what jars did he have available; what quantity of spirits; how difficult was the

[1] Baillie 1789, 72-73.

part to prepare? Once decided, Baillie had to cut the part carefully as required, then, as a guide in the school's archive advised, "the parts to be preserved should be suspended in as natural a situation as possible by means of a fine gut" in an appropriately sized glass jar—a task requiring some skill. The preservation fluid made up of "equal parts of rectified alcohol and very soft water" was best readied "several days before use" and was poured over the preparation to immerse it. Lastly, the jar was to be sealed by stretching a bladder over the lid, placing a small piece of "sheet lead" on top and then painting it shut with "a coat of thick black paint". Then, when that dried, it was covered with another coat of varnish.[2] Once finished, the preparation was catalogued and placed on the appropriate shelf in the museum, the sectioned body part ready for future inspection and use.

With the preservation complete, Baillie then wrote a paper on the "case". The finding and the circumstances surrounding it suggested to Baillie that the production of hair and teeth "may arise from an action in the ovarium itself" and, significantly, be a process apart from impregnation, which was the prevailing opinion regarding such findings at the time.[3] Baillie examined the existing literature to clarify and defend this position in his paper. It was then communicated by his other uncle, John Hunter, at a meeting of the Royal Society in February 1789, before being published in the *Philosophical Transactions* of that year.[4]

His election as Fellow of the Royal Society soon after might have been a reasonable concluding point for this work, but Baillie continued to write about the appearance in new ways.[5] In his major work, *The Morbid Anatomy of Some of the Most Important Parts of the Human Body* (1793), Baillie included a reference to the case in his description of "The Ovaria changed into a fatty substance with Hair and Teeth", a particular kind of "irregular" appearance that he identified and described.[6] Then, in his *A Series of Engravings, Accompanied with Explanations, which are Intended to Illustrate the Morbid Anatomy of Some of the Most Important Parts of the Human Body* (1799–1802), he provided an illustration of the preparation, drawn by William Clift and engraved by James Heath (Figure 1). The specific case Baillie had first written about was now presented by him as generally representative of "a very uncommon change of structure"—that is, as anatomical knowledge.[7]

[2] *Directions for Making Anatomical Preparations* 1831?
[3] Baillie 1789, 73-74.
[4] Ibid., 71-78.
[5] He was elected Fellow in 1790. Crainz 1995, 41.
[6] Baillie 1793a, 265-268.
[7] Baillie 1799–1802, 199-200.

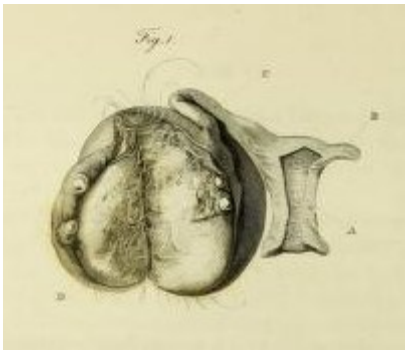

Figure 1: Ovary "converted into a membranous bag containing suetty matter, hair, and some teeth". The preparation was taken from the twelve-year-old girl discussed in this example. Matthew Baillie Fasciculus IX, Plate VII, Figure 1, *A Series of Engravings* 1799–1802, 199.

Such presentation was taken up by other practitioners, who utilised and expanded Baillie's descriptions, illustrations, and work. For example, Robert Hooper, in his work *The Morbid Anatomy of the Human Uterus and its Appendages* (1832), described "these adipose tumours"—an extension of Baillie's claims—that contain "teeth, hair, and bony substances", referring back to Baillie's description and concurring with his conclusions.[8] From a surprising finding in a snatched cadaver, through a series of preservations in spirits, text, and image, Baillie had thus made generalised anatomical knowledge about disease that was accepted, extended, and circulated through works on 'morbid anatomy' in Britain in the nineteenth century.

The above example encapsulates the central narrative and argument of my thesis. In the early nineteenth century, British approaches to the study of disease were largely synonymous with the practice of morbid anatomy. This was a practice undertaken by both physicians and surgeons that focused on describing lesions found in the cadaver post-mortem, often marginalising the patient's experience of illness in favour of anatomically understanding the changes in the textures and structures of the body caused by disease. The practice had been publicised and promoted primarily by Baillie in his major works, *Morbid Anatomy* and *A Series of Engravings*, and their numerous editions. Later authors would appropriate and extend central features of Baillie's publications for their own works, such as his descriptions. But these features were rooted in Baillie's own personal experience of the diseased cadaver within a specific institutional setting. As we saw in the example above, that experience was at first

[8] Hooper 1832, 27.

experiential, and enabled by the organisation of a ready supply of bodies to the school. Then it was preservative. Cadavers, especially diseased cadavers, were precious resources for the anatomy school. Techniques to preserve findings were therefore vital both to Baillie's practice and to his continuing study of anatomy and morbid anatomy, just as they had been to his uncle and teacher William Hunter. Baillie's publications on the case above demonstrate that this latter interaction with diseased appearances helped to shift Baillie's presentation of the appearance from a singular case to a generalised appearance of disease. It was now representative of a particular change in structure that could potentially be found in any (female) body. Furthermore, this characterisation was compounded and enhanced by the processes of making the preparation into a printed image, through procedures that involved a variety of artisanal and mechanical procedures with materials, and a number of differently skilled artisans. In short, the nineteenth-century British practice of morbid anatomy was rooted in the materials, experiences, practices, and publications of an anatomical approach to disease that had developed in the eighteenth century at the anatomy school in Great Windmill Street, articulated through the works of Matthew Baillie.

This thesis thereby provides a major new interpretation of British—and by extension European—approaches to the study of disease at the end of the eighteenth century. It does so in two main ways. First, it serves to demonstrate an active and innovative approach to the study of disease specific to Britain that was simultaneous with, and independent of, the famous developments in Paris which have been termed 'the birth of the clinic'. By elucidating British morbid anatomy, I establish an international context for the anatomical innovation in pathology previously ascribed by scholars almost entirely to Paris. Secondly, I locate this widened context by examining the materials and processes of inquiry into disease and the dissemination of findings in relation to it in the Georgian period. Beyond simply analysing the content of medical books, I interrogate their making from the procedures of dissection to the procedures of printing, from knowledge made at the dissection table to knowledge made in print.

In doing so, I examine ways of working and knowing about disease, rather than being concerned with a singular disciplinary history of 'pathology'. This follows John V. Pickstone's definition of a series of forms of knowledge produced through specific practices. Specifically, morbid anatomy was a natural historical practice that employed various crafts in order to make, describe, and classify kinds of diseased appearance.[9] Central in this practice were the

[9] Pickstone 2007, 494-495; Pickstone 2000.

interactions of medical practitioners with the diseased cadaver—the making of anatomical preparations working to solidify kinds of diseased structure. Furthermore, I argue that the material processes of making and circulating books worked in an analogous way. In this regard I extend the scope of Pickstone's definition, linking his work more directly to the 'material turn' in the history of the life sciences. As Anita Guerrini has argued, recent work by historians concerned with objects has helped to blur the boundaries between the history of science and the history of technology, as well as between both of these disciplines and the history of art.[10] By locating important aspects of knowledge-making practice within book production, I emphasise that practice was clarified and promoted through books both through the process of writing on it, and by the circulation of books about it. This helps to solidify the relation between work and knowledge, as well as suggesting an important point of interaction between types of knowledge-making practice.[11]

As a result, I pay particular attention to practices and their relations. Most significantly I examine the relationship between medical practice and medical publishing in the eighteenth century. I take it that practice (here the manner in which disease was studied) and publication (of works on the subject of disease) were neither simultaneously generated nor synonymous with each other, but instead acted as heuristics for the development of each other. This heuristic was not necessary, not balanced, and not inevitably or simply progressive. And, due to the immediacy of practice and the longevity of books, it at times followed very long and uneven chronologies. Furthermore, it was contingent on attitudes towards the epistemic authority afforded to printed texts, and the formation and acceptance of standards in reporting practice. Thus, though my thesis provides a new narrative on the development of morbid anatomy in Britain, especially between 1790 and 1830, it is also concerned with how the study of disease was taught across the long eighteenth century. Given Baillie's specific, anatomically focused work, this thesis also examines the development and use of new techniques for anatomical investigation—especially those of preservation which were key to the running of the Great Windmill Street school—that had originated in the seventeenth century. And given the importance of Baillie's publications in both articulating his approach to the study of disease as well as their success, the significant, though subtle, changes in the book trade as it related to

[10] Guerrini 2016, 470.
[11] It is a central part of Pickstone's definition that forms of knowledge can combine in various ways to form particular approaches to scientific inquiry. I suggest that books as objects in making and objects made can be central to such combinations. Pickstone 2000.

medical publishing that took place from the second half of the eighteenth century are also of concern here.

On first glance, these three narrative strands—the history of pathology, the development of preservation techniques for producing anatomical preparations, and the book trade in the eighteenth century—appear somewhat disparate. And indeed, historical investigation into the understanding of disease has typically approached it as an intellectual pursuit, whilst preparations have been focused on as enabling anatomical discovery. The history of the book, meanwhile, has tended to focus on long term trends in the trade as a whole, especially in relation to aspects of the form of books. But Baillie's work in utilising preparations as a knowledge-making practice to study disease, as well as being a descriptive and classificatory activity in text and image, spanned various medical, publishing, and artistic concerns across pedagogical and epistemic projects. Therefore, throughout the thesis, I focus on the material aspects of the practice of anatomy, art, and publishing in the eighteenth century. By this I mean that I focus on what historical actors did, what they did it with, and what other actors did in response. This has the major advantage of pulling these different narrative strands in a focused thread united in the myriad attitudes, concerns, and practices of those involved with attempts to better understand and publish on the subject of disease in the eighteenth century.

I make three substantive historical arguments related to Baillie's work. These pertain to the history of pathology, the history of anatomy, and book history respectively. First, I argue that morbid anatomy was one of many distinctive approaches to the study of disease in the eighteenth century. In the nineteenth century, however, it became the dominant British approach to the study of disease simultaneous to the developments in Paris; Baillie was a central—perhaps *the* central—figure in ensuring that this British approach did so. Secondly, I claim that Baillie's approach was profoundly shaped by his study of anatomy at the Great Windmill Street school, which was distinctive in the way it taught anatomy, and that Baillie drew on his education there in a distinctive way. Thirdly, the success of Baillie's work was intimately related to its embodiment of a specific type of publication—that of the instructional anatomical description—that allowed the new approach to be intelligible to readers, and fostered a particular type of practice. In making these arguments I utilise a flexible historiographical approach through the trans- and inter-disciplinary use of work in art history, material culture, the history of science, technology, and medicine, and book, print, and

publishing history. I take my lead in this regard from the practice of medicine in the eighteenth century.

In the following three sections I discuss the historical and historiographical grounding of my thesis, taking the study of disease, the study of anatomy, and book history in turn, before outlining the structure of the thesis alongside an explanation of the various methods and sources that I employ in order to bring these strands together. The purpose of this is to situate my thesis within current historiography and to emphasise what my novel approach to the history of pathology in the eighteenth century provides for historians and historical narratives.

0.1: The Study of Disease in the Eighteenth Century

Historians analysing the development of the study of disease in the eighteenth century have concluded that it became newly anatomical whilst acknowledging an increased interest in nosological categorisation during the period.[12] Such analysis points quite directly toward the developments in Paris at the turn of the century, termed 'the birth of the clinic' by Michael Foucault. This standard account of the development of pathology in this period argues that the reorganisation of medicine in France, and especially in Paris, which followed the French Revolution helped to reform pathology as an anatomical project concerned with lesions and their localisation. Particularly significant features of the French pathology were the unification of medical and surgical teaching, including the integration of clinical teaching within the main curriculum, the greatly expanded opportunities for legal dissection that could be linked to the patient's symptoms in life (anatomico-symptomatic correlation), and the development of a pathology of tissues by Xavier Bichat and his followers.[13]

The standard account has been criticised by historians on a number of fronts: predecessors to clinical teaching have been found; the long history of anatomico-symptomatic correlation has been asserted; the uniqueness of Bichat's work has been questioned.[14] However,

[12] See especially: Porter 1997, 258-265.
[13] Ackernacht 1967; Foucault (trans. 1989) 1963. A good summary of the developments in French pathology incorporating more recent scholarship can be found in Brockliss 2000, 120-139.
[14] On the overall 'myth' of Paris medicine see: La Berge and Hannaway 1998, 1-69; Brockliss 2000, 120-139. On predecessors to clinical teaching see: Brockliss 1998, 71-115; Porter 1997, 315. On the long history of anatomico-symptomatic correlation see: Wilson 2007, 32-34. On precedents to Bichat's work see: Keel 1998, 117-183. Bertoloni Meli also observes that physical examination, and thus interest in anatomy for the purpose of curing disease, was longstanding in medicine, if unevenly practised: Bertoloni Meli 2017, 6.

in terms of narrative there have been few alternatives to the standard account proposed.[15] Indeed, the standard account has expanded its geographical focus through the work of Russell C. Maulitz, who argues that the British were resistant to the French pathology in the early nineteenth century largely on nationalistic and political grounds—the conservative British were blind to the boon of the French approach in the attempt at maintaining their hierarchical status quo.[16] On such an account, work by British practitioners in the period is thus reduced to their receptiveness to Parisian ideas or not. By arguing that British practitioners had their own distinctive anatomical approach to the study of disease concurrent with the developments in Paris, I therefore provide an alternative geographical focus to the standard account that serves to better rationalise British resistance to Paris pathology. My purpose is not to diminish or dismiss the significance of the developments in Paris, but to focus on the very local developments dismissed by Maulitz in order that the significance of Paris is better understood within an international context. A vital first step in that regard is clarifying why Paris has been of such interest.

The focus on Paris has, in part, been due to historiographical concern with the history of pathology as a discipline. Maulitz's interest, for instance, is very squarely on how the developments in Paris lead to the histopathology of the nineteenth century.[17] However, this is to put the cart before the horse. The status of a unified discipline of pathology has been projected back onto the developments in the study of disease that began in the eighteenth century.[18] During the century, I argue that instead of there being a discipline of pathology, there were a number of different approaches to the study of disease. That there was a proliferation of approaches to the study of disease in the eighteenth century is emphasised by how medical practitioners used the word pathology in the period. Typically, it was used to indicate that a particular kind of method of investigating disease was being followed, though there was not one particular method to which the term referred. For example, Francis Carter, the author of *An account of the various systems of medicine, from the days of Hipocrates, to the present time* (1788), identified both "humoral pathology" and "phlogistic pathology", as well as stating that:

[15] Alternative narratives have typically taken on most of the features of the standard account. See Wilson 2007, 25-35 + postscript.
[16] Maulitz 1987.
[17] "The genealogy of ideas about tissue pathology is confined neither to the early nineteenth century nor to Bichat, nor even to the French milieu. […] But I am not so much concerned here with the genealogy of ideas. Rather I want to unravel the story of a tradition." Ibid., 3-4.
[18] This is largely a problem that stems from practitioner-histories of pathology, but is present in many professional histories of the same. An example of the former is G. Cunningham 1992.

"*Sydenham* applied no other pathology, no other method of cure, and that only in all diseases".[19] Baillie meanwhile saw himself as improving "our knowledge of the pathology of the body"—the only time he used the term in *Morbid Anatomy*.[20] As well as identifying pathologies, the term was also used in reference to specific systematic groupings that were both anatomical and non-anatomical such as: "the pathology and treatment of disorders of the nerves", or "the pathology of the fluids" respectively.[21] Both of these examples underline the lack of 'disciplining' that had taken place in the study of disease; in contrast to anatomy, 'pathology' could mean many things.[22]

But there had been a well-defined discipline of pathology. Old pathology was theoretical in the same way that Andrew Cunningham has argued that old physiology was—primarily pursued through the practitioner's reasoning and their pen rather than being observational and experimental.[23] For example in the work of Théophile Bonet (1620–1689), pathology was the intellectual investigation of disease, which has been usefully termed "pathology in the library".[24] In Pickstone's terms, this consisted of a working practice of reading and rhetorical argument that dealt with meanings.[25] Hermann Boerhaave was the major figure who advocated this approach in the early eighteenth century, and there remained advocates of this approach even in the late eighteenth century. The medical author, James Makittrick Adair, for example, differentiated "pathology and practice" in his *Commentaries on the principles and practice of physic* (1772).[26] He saw medical practice as distinct from pathology, which was academic and theoretical. Tellingly, at a time when pathology was apparently becoming anatomical, the terms 'morbid anatomy' and 'pathological anatomy' do not appear at all in Makittrick Adair's text.[27]

Alongside the continued pursuit of library pathology, new approaches to the study of disease emerged in the eighteenth century which, broadly speaking, mirrored the two major experimental enterprises related to medicine in the eighteenth century: anatomy and

[19] Carter 1788, 128, 157, 183 author's emphasis.
[20] Baillie 1793a, iii. Text-only searchable versions of *Morbid Anatomy* are available from archive.org
[21] *London Medical Journal* 1781, 98; Makittrick Adair 1772, 145.
[22] Andrew Cunningham has argued that anatomy was a relatively unified discipline in the eighteenth century. Cunningham 2010, 17-82.
[23] Cunningham 2002, 631-665; Cunningham 2010, 156-165.
[24] Cunningham 2010, 190. See also: Wilson 2000, 271-319.
[25] Pickstone 2007, 494.
[26] Makittrick Adair 1772, vi.
[27] Makittrick Adair. I used the search terms 'morbid anatomy' and 'pathological anatomy' for the book digitised on Eighteenth-Century Collections Online.

chemistry.[28] As I show in Chapter 1, these approaches ranged from the overtly anatomical approach of Baillie to the chemistry-focused approach of, for example, Sir John Pringle, with various points in between.[29] The study of disease in the late eighteenth century was thus characterised by a heterogeneity of approaches. I therefore largely avoid the term 'pathology' in this thesis except where authors self-identified their work as specifically theoretical in purpose or aspect. As a result, when I use the term, I am in effect referring to the old, library-based pathology rather than any sort of supposed predecessor to the later histopathology of the nineteenth century.

Despite there being a number of approaches to the study of disease in the eighteenth century, there were nevertheless important points of unity across approaches. Perhaps most important for both the practice of physic and surgery was the writing of case histories. Accounts of medical practitioners' interactions with patients aimed at the improvement of some aspect of that practice had long been established as an important method of critically engaging with and improving patient encounters.[30] The central feature of cases was their narrative element, which could enable critical engagement with the decisions and actions of medical practitioners in the full context of the treatment of patients. Crucially, this was done through the analysis of texts by practitioners—cases were written accounts, and so were analysed textually. By the eighteenth century, this critical engagement was primarily concerned with diagnostics, prognostics, therapeutics, and post-mortem examination. Cases published in books and periodicals were a valuable and widely-used testing ground for a variety of projects and ideas about disease.

One such project that was particularly significant for our purposes was the correlation of the symptoms a patient had presented with in life with the post-mortem findings made in the individual's body after death: anatomico-symptomatic correlation. As Adrian Wilson has shown, anatomico-symptomatic correlation was a central goal for a number of practitioners in the eighteenth century, best exemplified by the work of Giovanni Battista Morgagni, and a major feature of Parisian medicine where, as Wilson argued, it "attained a new level of *success*".[31] However, Wilson observes that there has been relatively little attention paid by historians to the practice. Primarily, this is because "anatomico-symptomatic correlation not only *was* difficult—both to practise and to theorize—but also *is* difficult, specifically difficult

[28] Cunningham 2003, 51-76; Principe 2007, 1-22. See also: Pickstone 2000, 106-110.
[29] On Pringle see: Weidenhammer 2016, 21-43.
[30] Pomata 2014, 1-23.
[31] Wilson 2007, 32-34 author's emphasis.

to grasp historically".[32] The main reason for this, is the sheer number of practically and conceptually difficult moving parts that the process involved. To give a simple picture: one had to identify a symptom or a group of symptoms characteristic of a disease before then making a number of post-mortem observations that were sufficient to come to 'understand' a diseased appearance, finally correlating the diseased appearances with the symptoms. This is to omit practitioners' concerns with the course of diseases, with therapeutics, and with ideas about how the disease had functioned or stopped normal function within the body, all of which were related to the subject in varying degrees depending on factors like the patient, disease, symptom, or lesion in question, which were reported on in varying degrees depending on the goals and preferences of the medical practitioners undertaking the practice.

The complexity of the practice has been an important contributing factor in the conflation of Baillie's work with that of Morgagni's. Because both practitioners dissected diseased cadavers and examined lesions in their attempts to better understand disease their work is often reduced to the same narrative.[33] But they undertook dissection for different purposes and to different ends and it is useful to distinguish their work. Morgagni, in *De sedibus et causis morborum per anatomen indagatis* ('On the seats and causes of disease investigated by anatomy' 1761), was concerned with the publication and analysis of case histories. This included investigation at post-mortem, but also symptomatology, anatomico-symptomatic correlation, and therapeutics, amongst other concerns, all aimed at improving the practice of the physician.[34] The most significant and uniting factor in Morgagni's practice was the analysis of these various concerns *in text*. By contrast, Baillie specifically differentiated his approach from that of Morgagni, providing generalised descriptions of the structures of the body changed by disease in a systematic manner. It was a particular kind of approach quite separate from the writing of cases, and to that end Baillie wrote a different kind of work from that of Morgagni's. Instead of writing in cases, Baillie wrote a work of anatomy on the subject of disease. As I argue in Chapter 3, this was a work in a different genre to the writing of cases, which I term the 'instructional anatomical description'. This was not concerned with analysing cases, as Morgagni's work was, and served a different purpose in the improvement of practice. Rather than improving the physician's approach to individual cases, Baillie explained that morbid

[32] Ibid. postscript.
[33] Both of the main accounts of eighteenth-century developments in the study of disease do this. Porter states that Baillie was "Building on Morgagni": Porter 1997, 264. Cunningham refers to Morgagni and Baillie in the same section on 'Pathology: a sub-discipline of anatomy' as "our pathologists": Cunningham 2010, 218.
[34] For an example of Morgagni's use of cases see: Jarcho 1968, 87-95.

anatomy would provide a sound basis upon which knowledge of the disease could be built, just as anatomy provided a sound basis for the pursuit of physiology in this period.[35] So, while both Morgagni and Baillie dissected diseased cadavers, their work was very different. As a result, throughout the thesis I differentiate the dissection of cadavers in the anatomico-symptomatic correlation tradition and in Baillie's practice as 'post-mortem investigation' and 'morbid anatomy' respectively.[36]

Whilst it is important to make this distinction, it is also important to recognise that anatomico-symptomatic correlation and morbid anatomy were similar practices that influenced each other. But this was a knotty relationship. The practices were intertwined, and therefore difficult for a historian to separate; while we might pull at individual strands in order to examine them, those strands adhere to others with different strengths at various points. As we saw above, for example, Baillie's goal was ultimately to improve the understanding of symptoms, therapeutics, and medicine itself. This was, in bald terms, the same ultimate goal as anatomico-symptomatic correlation from a different approach. But that approach involved some of the same activities differently applied. How different that application was is difficult to grasp. Domenico Bertoloni Meli has recently argued that Baillie's work represented a new kind of localisation different from the study of lesions in the case history tradition, that of "double localisation" where "careful study of, and differentiation among, lesions was at least as crucial as localization" in the traditional manner.[37] On this gloss Baillie's work was not only focused on lesions, but newly focused on lesions. I think this view, whilst useful in terms of differentiating Baillie's work from most prior localisation, is difficult to maintain when considered alongside Baillie's own statement that: "In some of these periodical works, the diseased structure has been frequently explained with a sufficient degree of accuracy", indicating that the care and differentiation between lesions that Bertoloni Meli locates solely in Baillie's work was present in other works, likely surgical works, but also works of anatomico-symptomatic correlation too.[38] This view comes under further scrutiny when the wider influence of *Morbid Anatomy* is considered.

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[35] Baillie 1793a, ii-viii.

[36] This enables and emphasises the focus of this study to remain on the complex interaction between the activity of dissecting a diseased body and inspecting its lesions, and the relation of that activity to the study of disease more generally.

[37] Bertoloni Meli 2017, 213.

[38] Baillie 1793a, vii. On the development of surgery in this period as it related to anatomy and physic see: Temkin 1951, 248-259. I focus on physicians' interactions with dissection in this thesis in order to emphasise the influence that such practices had on their works.

Baillie's work was used flexibly across a variety of projects relating to disease in the eighteenth and nineteenth centuries. As I demonstrate in Chapter 5, this usage spanned works by physicians and surgeons, with the practice of morbid anatomy becoming the main way that British medical practitioners approached the study of disease in the early nineteenth century. Primarily, this was because morbid anatomy was practical, and could be used to fit a variety of differently motivated projects. Baillie had been careful to present his work as unconcerned with the kind of theoretical wrangling over disease that was often seen to characterise library pathology, limiting his work to description and reasoning based on description. Of course, in itself this was a theoretical standpoint, but it was one that was compatible with practitioners who had more committed theories of disease. Morbid anatomy thus became a unifying practice within British medicine, which served the conservative reform agenda that Carin Berkowitz has identified was present in British anatomy in the same period.[39] This was a widespread concern with reforming British medicine, particularly medical education, whist maintaining its perceived character and its institutions, embodied by the royal colleges. Conservative reformers saw morbid anatomy as a distinct British practice that was more practical than the developments in France, and also maintained the traditions of entrepreneurship in British medicine. By the 1830s, morbid anatomy was a highly visible part of British medicine in book titles, courses of lectures, and even job titles. Furthermore, in many respects the practice of morbid anatomy in the nineteenth century was anchored in anatomy—courses were concerned with 'anatomy and morbid anatomy', as were museum collections. Books on morbid anatomy employed the same features as Baillie's work, which was itself a work of anatomy on the subject of disease. The history of morbid anatomy in Britain therefore provides new insights into the history of anatomy, as the next section discusses.

0.2: Making Anatomical Knowledge in the Eighteenth Century

In the eighteenth century, anatomy was an experimental discipline. In fact, as Cunningham argues, anatomy was "the experimental discipline par excellence in the investigation of the phenomena of life". Cunningham contrasts the experimental anatomical discipline, concerned with physically manipulating the body in order to better understand it, with physiology in the period, which was not experimental but library based.[40] In the previous section, I made a distinction between the post-mortem examination of cadavers for the writing of cases and

[39] Berkowitz 2015a.
[40] Cunningham 2010, 155.

morbid anatomy. In this section I argue that that this was a difference between a practice aimed at participating in a text-based, library pathology on one hand, and an experimental approach on the other. Baillie's conception and practice of morbid anatomy was firmly rooted in his education at Hunter's Great Windmill Street school. There Baillie gained an intimate personal knowledge of the cadaver through sensory engagement with it, incorporating the use of tools and materials in order to facilitate its manipulation, with the aim of producing new knowledge about the body. As part of this work, anatomical preparations were collected, retaining the body's information but also displaying it both as an object and in text through cataloguing. Hunter's large-scale collecting and cataloguing of preparations in turn enabled new ways of investigating the body. This was vital for Baillie's presentation of morbid anatomy in his written works. Using the collection, Baillie presented generalised knowledge of diseased appearances in text and image in the manner of an anatomy book. The discipline of anatomy thus disciplined Baillie's own work by providing a method and a prescriptive manner of presenting findings.

Central to this disciplining in the early modern period was the translation of the individual's sensory experience of the cadaver into generalised knowledge of the body that was applicable across time and space. The clearest example of such work can be found in anatomical books which, especially after Andreas Vesalius's seminal *De humani corporis fabrica* ('On the fabric of the human body' 1543), presented the results of the messy, difficult business of dissection as essentially a guidebook to the human body. This was an ontological impulse that served to solidify the generation and sorting of 'true' facts about natural materials as key to understanding nature more widely.[41] In Pickstone's terms, this was a "culture of fact".[42] Concurrently, natural philosophers engaged with experiment appropriated the values and knowledge of artisanal practices, which incorporated an emphasis on personal bodily experience, whilst working to distance themselves from potential concerns regarding the unreliability of the senses.[43] Craft practices and the personal experience of natural philosophers were thus central to the investigation of nature in this period, and viewed as serving intellectual endeavour.[44]

[41] Cook 1993, 49-50.
[42] Pickstone 2007, 499.
[43] Long 1997, 3; Smith 2004, 186.
[44] Anatomical examples can be found in: De Munck 2010, 332-356; Klestinec 2010, 33-58. This occurred in other types of inquiry into nature, such as chemistry. See: Roberts 1995, 503-529. On the relationship between empiricism and natural philosophy more generally see: Cook 2010, 9-32.

A key supporting pillar in this work was collecting. As Harold J. Cook has explained, the creation of museums of natural objects might be viewed as the 'big science' of the seventeenth century as it plugged individual practitioners into an internationally located network of objects that solidified singular points into general knowledge about the natural world:

> Deciding what constituted 'fact' necessitated cooperative research, technical expertise, and access to collections of books and bottles, shells and stones, anatomy theatres and botanical gardens, glassware, chemicals, tools, instruments, and machines, living and dead plants and animals, paper, pictures, and postbags.[45]

Much recent historical work has therefore focused on collecting objects as enabling a more rounded picture of inquiry into nature, which historians have extended into the eighteenth century.[46] Initially, this collecting was individual and thus had little unifying organising principle, but by the eighteenth century, specialist collections which emphasised the attempt at ordering nature within institutions began to replace individual fancy.[47] In turn this influenced individual collectors such as the Hunter brothers, who both emphasised the benefit to the public their work and museum provided.[48] Simon Chaplin has argued that the Hunters' museums can be understood in terms of series of actions and processes, what he terms the "museum oeconomy", linking these actions to sociality and virtue in the period.[49] But these actions and purposes were epistemically orientated too. Actions of dissection and processes of preservation gave individuals experiential knowledge of the cadaver, but when performed in a museum context, those actions and processes were networked into an international context of anatomical investigation.

In basic terms, the actions of dissection did not change over the course of the early modern period—the task was still dissecting cadavers in order to understand the constituent parts of the body better. But in the seventeenth century, the development of new techniques especially concerned with preserving the body changed the range and scope of anatomical investigation and enabled the permanent preservation of body parts. There were two particularly significant developments: techniques for injecting the body with various substances were invented, and ways were found of preserving the soft parts of the body, termed

[45] Cook 1993, 58.
[46] Guerrini 2016, 471.
[47] Guerrini 2003, 591-592. On collecting and cabinets of curiosity in the early modern period see for example: Findlen 1994; Impey and MacGregor (eds.) 1985; Daston and Park 1998.
[48] Chaplin 2015, 35-36; Chaplin 2012, 108.
[49] Chaplin 2015, 29.

anatomical preparations by practitioners.[50] This had two major effects on anatomy. First, the development of new ways of exploring the body initiated a range of new discoveries made by anatomical practitioners, especially those who had invented their own techniques. Second, collections of anatomical preparations enabled the scope of anatomical inquiry to change. I treat the historiographical work on each of these developments now in turn.

Anatomical preparations have received sufficient attention from historians such that the main 'breakthroughs' in their development in the late-seventeenth and early-eighteenth centuries are well-known.[51] Preparations have been shown to have been dynamic tools for the anatomist, not only for epistemic reasons. Rina Knoeff has demonstrated that the preparations in Frederick Ruysch's cabinet were handled, re-dissected, and even kissed by visitors to the collection for a variety of epistemic and emotional reasons.[52] Meanwhile, Daniel Margócsy has written extensively on the commercial value of preparations.[53] The materials used in injections have also come under historical investigation.[54] Notably, Marieke M. A. Hendriksen has re-enacted the making of corrosion casts in order to argue that the skills that practitioners used to make such casts were not simply imported from artistic practices, but uniquely constituted in their own right.[55] However, as Lucia Dacome has observed, this work has focused on the practice's "seminal season", when both the techniques and discoveries related to them were new.[56] By contrast, the making of preparations in the late eighteenth century has been little explored, which has had the effect of marginalising the objects and the processes that made them in the eighteenth century. Indeed, two recent works covering the century—*Anatomy and the Organisation of Knowledge, 1500–1850* (edited by Matthew Landers and Brian Muñoz)

[50] On the terminology regarding anatomical preparations vs specimens in the eighteenth century see: Chaplin 2008, 139-141.
[51] Cunningham 2010, 231-240 gives the most complete history of the developments in techniques for making anatomical preparations. Cole 1921, 285-343 remains the classic text on the development of the injection technique. On the development of corrosion techniques see: Hendriksen 2019 (preprint), 1-29. For the early history of preparatory practices and their role in anatomical discoveries see: Cook 2002, 223-247; Cook 2014, 302-329.
[52] Knoeff 2015, 32-44.
[53] The monetary value attached to preparations in the seventeenth century was related to epistemic concerns. Margócsy 2014; Margócsy 2009, 187-210; Margócsy 2011, 185-215.
[54] On the use of mercury in anatomical injections see: Hendriksen 2015; Hendriksen 2014, 516-548.
[55] Hendriksen 2019 (preprint), 1-29. The recreation of historical experiments has encountered some success in recovering the relation between scientific knowledge and embodied knowledge. Otto Sibum has termed the knowledge the historian gains from such work 'gestural knowledge'. Sibum 1995, 73-106. On following early modern recipes see: Smith and the Making and Knowing Project 2016, 210-233. A summary of historical experiments related to the 'material turn' in the history of science can be found in: Werrett 2015, 339-352.
[56] Dacome 2017, 216.

and *The Study of Anatomy in Britain, 1700–1900* (Fiona Hutton)—scarcely mention anatomical preparations at all.[57]

However, one important aspect of eighteenth-century anatomical collecting has been the subject of scholarly attention: modelling, especially wax modelling. In part this is because of the greater range of practitioners who engaged in the practice, which often indicated a wider intended audience for their work. Not only were male anatomists involved, but sculptors and women too. For example, Anna Morandi Manzolini was the most prominent wax modeller of the eighteenth century. She gained the patronage of the Pope, and a university position in Bologna, and was internationally renowned for her work. Furthermore, her modelling work represented her own anatomical discoveries.[58] Most wax models demonstrated existing anatomical knowledge, but were nevertheless sought after and circulated throughout Europe. Anna Maerker has shown that this could be controversial. The Florentine wax models that were transported to Vienna in the 1820s were viewed by the medical elite there as a threat to their authority and, due to genitalia being displayed on the models, unsuitable for public display as intended.[59] Wax models have thus been shown to be part of international networks of activity incorporating a range of actors and institutions. As a result, Maerker has argued that we ought to consider models as a technology that enacts "a combination of objects and human activities" and which "brings to the fore the role of users, uses, and purposes".[60]

This definition is useful for anatomical preparations in the late eighteenth century. I suggest that the reason they have been largely omitted from the consideration of historians is that by the late eighteenth century, the techniques of preparation were no longer novel. But technologies have long shelf lives in the pursuit of knowledge, sometimes gaining different purposes at different junctures. This point is related to David Edgerton's observation that newer forms of technology make up a small part of current technology.[61] It goes further than Edgerton's point, moreover, by intimating that as technologies mature, the scientists who use them may have more opportunities *to create* novelty as skills increase and more possibilities are explored. This emphasis has the benefit of shifting the focus of historical inquiry from the various techniques that were created and what effect they had *on* anatomy, to the practice of

[57] Landers and Muñoz (eds.) 2012 focuses on the wider cultural impact of anatomy. Hutton 2013 focuses on the teaching of anatomy in Manchester and Oxford.
[58] Messbarger 2010; Dacome 2017.
[59] Maerker 2011. On the circulation of 'portable anatomies' and the work of Marie-Marguerite Biheron see: Carlyle 2017, 23-49.
[60] Maerker 2013, 532.
[61] Edgerton 2007; Edgerton 1999, 1-26.

anatomists and how they used technology in order to interrogate the body, learning *by* anatomy. Given that anatomical preparations were a relatively mature technology at the commencement of Hunter's career, the making of preparations at Hunter's school is a particularly valuable case study: what purpose did collecting continue to have or find? How did he make novel discoveries with old techniques? Was collecting on such a vast scale crucial in that regard?

In regard to the latter question, Samuel J. M. M. Alberti in his study of museums housing pathology collections in Britain in the nineteenth century has emphasised that the scale of the pathological museum was fundamental to research into disease.[62] I argue that this can be extended back to the late eighteenth century and to the work of Baillie in particular. My emphasis on the scale of collections as central to anatomical inquiry provides a new narrative on the collecting of such objects in the late eighteenth century. Their historiographical neglect has made it appear that preparations made in the eighteenth century were only made for the purposes of pedagogy and display, albeit with some noted exceptions.[63] In addition, the long period between the initial developments in anatomical preparations producing novel anatomical findings, and the use of the nineteenth-century pathological museum to do the same suggests that the eighteenth century was a period in which collections of preparations were merely 'built up', without much use in anatomical inquiry. Notwithstanding the questions this poses as to why anatomical collections were built up on such a scale if their purpose was simply to illustrate lectures, this characterisation confers a degree of technological determinism on the history of preparations in anatomical inquiry: their initial development initiated a number of notable discoveries (of Swammerdam, Ruysch, and so on), and once collections were of a sufficient size, more comparative research could be carried out. Thus, the implied middle period appears barren by virtue of a lack of novelty of either technology or institutional setting. My focus on the use of mature techniques in the pursuit of anatomical knowledge emphasises why collecting on a significant scale was valuable for anatomists like Hunter: it enabled more destructive experiment.[64]

Prior to the invention of preservation techniques, dissection was largely a destructive practice. Dry preparations could be made, but these necessarily were quite different from the original body.[65] At the same time, bodies were difficult to obtain throughout the early modern

[62] Alberti 2011. In Chapter 5 I link this development to the practice of morbid anatomy initiated by Baillie.
[63] Cunningham 2010, 141-142 states that John Hunter's practice of making preparations was important in his anatomical inquires but omits William Hunter and other members of the Hunterian school from this view.
[64] Of course, at Hunter's school collecting also served pedagogical purposes. See Chapter 2.
[65] Cunningham 2010, 233.

period and remained so in many respects (specific types of body such as pregnant women were particularly difficult to obtain). This persisted in Britain at least until the Anatomy Act (1832) was passed. Therefore, it was sensible for anatomists to be relatively conservative in their work with bodies. When wet preparations were developed and permanently preserving parts largely as they were encountered in the body became possible in the seventeenth century, dissection then changed to be a potentially constructive practice. Parts could be conserved, which in turn enabled *different kinds* of destructive practice. In certain cases, these practices might only be differentiated by the intention of the anatomist. An injection of mercury into the vessels might be exploratory and temporary—only of use until it burst through the vessel wall—or, if mixed with tin, might solidify to preserve the same vessel's branches.[66] Collecting enabled experiment by providing a material basis for knowledge that could be referred to for comparison or correction. Furthermore, large scale collecting enabled anatomists to experiment with rarer cadavers—the first ossification of an artery you might preserve as found, but the second one you might attempt to inject, for instance.

What was discovered, as outlined at the start of this section, was experienced through the senses. The use of preparatory techniques and the making of preparations encouraged tactile engagement with the cadaver and the materials used in preparations, making the structures of the body visible to the eyes. As I argue in Chapter 2, these interactions and the sensory knowledge that resulted were recorded through the making of preparations and accompanying cataloguing. Thus, practitioners' embodied knowledge of materials and techniques served to create definitional accounts of findings in the body in object and text. These recording practices were then used as the basis for presenting findings, and so impacted on the presentation of anatomical knowledge more widely, such as in the case of Baillie's *Morbid Anatomy.* In his work, Baillie relied on objects and accounts of sensory experience to draw generalised conclusions about diseased appearances, and Baillie's descriptions were often explicit about those experiences. *Morbid Anatomy* was thus based on generalising from sensory experience in the manner of anatomical investigation throughout the eighteenth century. In other words, it was a work of anatomy, and Baillie presented it as such.

[66] See Hendriksen 2015.

0.3: Publishing on Disease in the Eighteenth Century

Baillie's *Morbid Anatomy* was a work of anatomy on the subject of disease. Such a work had not been published before, but it was highly successful. Before Baillie's death in 1823 the work went through five editions in Britain, was translated into German, French, and Italian (a Russian edition appeared after his death), and had a number of American editions. It was one of the best-selling works of learned medicine published in the late eighteenth and early nineteenth century.[67] Yet the work has received little scholarly attention. In part, this has been due to historians' focus on Paris as the centre for developments in the study of disease in this period, as discussed above. More widely, historians have not engaged with the trade for medical books in the eighteenth century, and where they have, have focused on illustrated works at the expense of text-only books. However, book history approaches are particularly valuable in exploring the form of books and have been well-utilised by historians focusing on other periods, providing crucial insights into the formation of the content of works. In this thesis, I utilise these approaches to interrogate Baillie's work more fully, which in turn marries book history approaches to the history of anatomy in the eighteenth century.

The book trade expanded significantly over the course of the eighteenth century, and the production of anatomical works and medical works more generally shared in that wider development. Over the course of the century, the total number of separately printed items published per year rose from circa 2,000 to around 8,000 items. This rise was not simply a steady increase, but fluctuated year on year along with the successes and failures in the market. But in general, the trend in the production of books in the eighteenth century was exponential—a slow rate of increase followed by a greater, and increasingly rapid rate of increase towards the end of the century.[68] Within the total market for books, science and medicine were small but significant subjects that made up approximately 4.5% (9,000 out of 197,000) of the total books printed during the century.[69] The publication of scientific and medical works such as

[67] *A series of engravings* went through two English editions before Baillie's death. Crainz 1982, 445-450; Crainz 1995.
[68] See the graph in: Raven 2007, 8.
[69] This figure has been arrived at through John Feather's 'preliminary subject analysis' of the *English Short Title Catalogue*, which used the Dewey Decimal System categories to number the books printed on specific subjects in the database (Feather 1986, 36), combined with my own search of the catalogue using the term 'medicine' in the date range '1700->1800' (which brings up over 3,000 results). This figure must be caveated with the point that within the database there are a number of issues, not least a number of errors in the input of data, and a lack of standardisation across a range of important categories including the classification of books. See: Karian 2011, 285-290. A more recent analysis has generated different numbers from the *ESTC* but to a similar conclusion. Suarez 2009, 46-47.

anatomical works mirrored the rest of the market in increasing towards the end of the century as the book trade expanded.

This was facilitated by longer term trends in the book trade that worked to create new working practices and new types of publication, alongside the repurposing of older types of practice and publication. These changes were vital to the form and publication of Baillie's work. Overall, the eighteenth century saw a shift from an unstable and unreliable trade at the end of the seventeenth century to, as Betty A. Schellenberg has put it, "an entrenched, self-regulated, and credible—that is, modern—print culture" by the eighteenth century's end.[70] There were three main developments over the course of the century that facilitated this: new organisational practices were developed from the seventeenth century that enabled the development of periodical publications; the disruption of the stable trade by increased competition in the second half of the century, possibly facilitated by the 1774 House of Lords ruling against perpetual copyright; and the development of new markets for publication by entrepreneurial publishers in response to this and also, ultimately, larger and more settled publishing houses who were rooted in their entrepreneurial flair.

Instability in the seventeenth-century book trade worked to change its organisation as booksellers co-operated through forming 'congers'—groups of booksellers and printers who worked together to finance and print books—working to reduce risk in the industry and combat transgressional practices.[71] One of the results of this was a new printed format: the periodical. As Michael Harris has observed, periodicals were a good deal for printers and provided a useful service for booksellers—printers gained a regular source of income as new entrants to the trade challenged, and booksellers could utilise advertising in order to encourage the sale of books or other services.[72] As periodicals and the new newspapers became popular, the work required to create large print runs regularly saw printers reorganise how their presses ran, increasing capacity, allowing printing costs to come down, and cheapening book prices.[73] This worked to create effective monopolies in the book trade, which John Feather has argued caused a rather barren period for publishing in the middle of the eighteenth century due to the insipid influence of the effective monopoly in place in London, but by contrast, the late eighteenth century as a time where "new developments came from every direction".[74] However, the middle of the

[70] Schellenberg 2009, 30; Johns 1998, 171-172; McKitterick 2003, 8.
[71] Harris 1981, 69; Johns 2003, 74-77; Johns 1998.
[72] Harris 1981, 70-71. See also: Tierney 2009, 479-497.
[73] Raven 2007, 245-246. There was little technological change during the hand press period: Gaskell 1995, 2.
[74] Feather 1988, 117. See also: St Claire 2004.

century, rather than being a period of stagnation, saw a number of innovations; from books becoming more "consumer-friendly" by coming pre-bound, to catalogues listing multiple booksellers' offers, and even niche catalogues for genres like children's books and architecture.[75]

Feather's analysis does capture an important change in the book trade between the middle and end of the eighteenth century however: the huge increase in the numbers and variety of books published. The source of this change has been a source of some debate by historians, especially in regard to the role of the 1774 House of Lords ruling against perpetual copyright. Most prominently, William St Clair argues that prior to the ruling, English booksellers had been primarily concerned with keeping old texts in print for as long as possible, and prosecuting those who reprinted their property illegally. When their perpetual copyright was removed, the old congers came under threat and both old and new booksellers had to produce new products. This encouraged the trade to increase fourfold in the last quarter of the century, books becoming smaller and cheaper as a result.[76] Against this, James Raven has argued that the evidence of the impressive impact of the 1774 ruling that St Clair identifies is too reliant on the fortunes of literary anthologies and abridgements. He asserts: "Scholarly, scientific, political, and technical writing all rest uneasily with the contours of a study (like others) that places so much emphasis upon the 1774 Donaldson verdict", and concludes that the main effect of the 1774 verdict was actually to reduce risk in the industry, encouraging new entrants to the trade. Old publishers were afforded sufficient protection in the short-term from the ruling due to their financial muscle, whilst new entrants were safe from prosecution when publishing old titles that could provide an almost guaranteed profit.[77] Whatever the precise reason for the increased trade in books, it is certain that in the late eighteenth century new entrants disrupted the trade leading to booksellers old and new publishing a greater variety of books in greater quantities than ever before in Britain.

Within this exponential increase in the numbers of books published were booksellers and their publishing practices. In the last quarter of the century, the book trade became more entrepreneurial; booksellers had to be creative both in devising new products to market, and in business practice.[78] William Zachs's account of the life of the bookseller John Murray (a specialist in medical works) demonstrates that business models and patterns of publishing

[75] Schellenberg 2009, 31.
[76] St Clair 2004, 66-71, 77-80, 87-98, 105-109, 111-118.
[77] Raven 2007, 231-232, 238. On the numbers of new entrants see: Zachs 1988, 77; Maxted 1977, xx-xxiv.
[78] Topham 2007, 139-141; Topham 2009, 827-833.

shifted in this period, the legal ruling modifying the industry rather than provoking revolution. Murray, who was outside of the elite, copyright owning members of the book trade, was an enthusiastic supporter of Alexander Donaldson (who led the case against perpetual copyright) but did not himself reprint books before 1774. After the verdict, he began to reprint books in his characteristically cautious way, but also joined the congers of the old elite. For Murray, this was sensible business and not a betrayal of his principles. Some new entrants explicitly took advantage of the 1774 ruling by reprinting English poetry cheaply for a mass audience, such as the bookseller and printer John Bell.[79] Murray, however, saw the future as lying in the 'simple publisher', a one book one publisher model, but deftly responded to the contemporary economic situation in the late eighteenth-century book trade where old and new business practices overlapped for entrepreneurial booksellers.[80]

For Baillie, the book trade's expansion and increasing entrepreneurism had two consequences in the publication of his works. First, there was a growing cadre of publishers who identified and targeted medicine and medical men as a large and growing group who required books, both standard and new. Murray was one such publisher who specialised in medical works (alongside other kinds of publication), as was Joseph Johnson, Baillie's publisher. Second, the financial imperatives of the trade encouraged the production of both conservative and innovative products, as well as products at points in between. Baillie's work was conservative in that the instructional anatomical description genre was well-established and relatively stable—successful works in the genre would go through multiple editions over many decades to the obvious benefit of author and publisher. But it was also innovative as disease had not been published in the genre before. In the rest of this section I discuss the form that Baillie's work took on in this context, relating his work within the wider publication of works on anatomy and disease.

Overall, most anatomy books published in the eighteenth century were text-only, and did not contain illustrations. Such works have been largely ignored in the history of anatomy at the expense of a focus on illustrations. Bertoloni Meli recently stated that it is "almost inconceivable to investigate the history of anatomy ignoring illustrations".[81] This follows Lorraine Daston and Peter Galison's argument that images in scientific atlases "are the visual

[79] Raven 2007, 238-239, 243, 247.
[80] Zachs 1998, 57-61.
[81] Bertoloni Meli 2017, xi. Relatedly Ruth Richardson expressed surprise at discovering that there were still text-only works of anatomy in the nineteenth century: Richardson 2008, 109. Sachiko Kusukawa has emphasised the importance of considering image *and* text in the making of anatomical works: Kusukawa 2012.

foundations upon which many observational disciplines rest".[82] However, text-only anatomical books were a significant part of medical publishing and likely sold better than their illustrated counterparts. Not only were they far likelier to be published, they were more often published in multiple editions. In an analysis I made of the *English Short Title Catalogue*, I found that text-only works were more commonly printed compared to illustrated works—there were a total of 101 illustrated works from a total of 327 titles—and that they were much more commonly *re*printed than illustrated works. In the total market for anatomy, the most common publications in the eighteenth century were reprinted works.[83] Of the 327 anatomical titles that appear in the catalogue, 192 of them were reprints of already published works (70 of those illustrated), and 135 were new works (31 illustrated). Furthermore, the market for anatomy was in-step with the rest of the book trade as it followed the trend of the whole market in rapidly increasing towards the end of the century. As the graph below (Figure 2) shows, the total number of new works doubled in the period 1770–1800 whilst the number of reprinted works doubled in the period 1760–1800.[84] Works of anatomy were therefore not typically illustrated, the published foundation of the discipline resting in text: not only were such works easier and cheaper to print, they were easier to sell.

[82] Daston and Galison 2007, 48.
[83] This followed wider trends in the book trade. See: Suarez 2009, 61-64. On the trade in reprinting during the century see: Bonnell 2009, 699-709.
[84] The data presented here is in effect a preliminary analysis that I hope to develop further in the future. As a result, I have not included the findings in an appendix as it is too noisy.

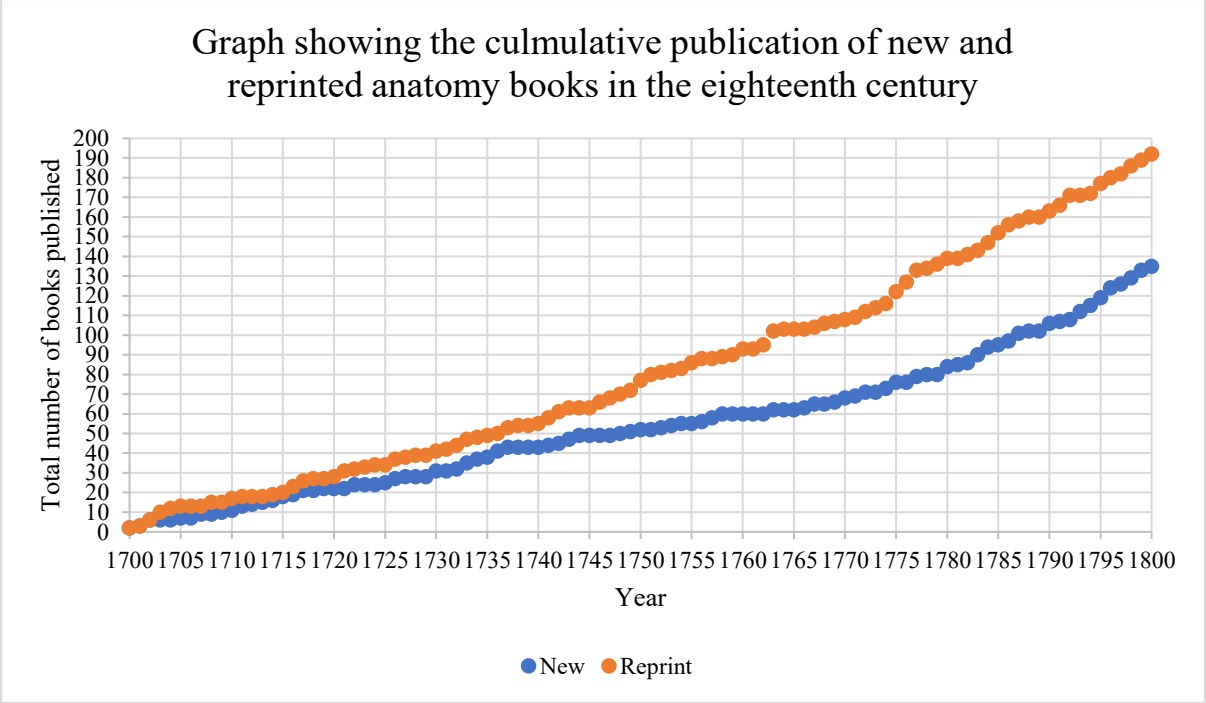

Figure 2: Graph showing the cumulative number of new and reprinted works published on anatomy in the eighteenth century. Data taken from the *English Short Title Catalogue*.

Popular text-only publications were not necessarily unique works of anatomy. As James Keill, the author of *The anatomy of the humane body abridged, or, A short and full view of all the parts of the body together with their several uses drawn from their compositions and structures*, readily admitted: "I have followed the Method of that useful Epitome, written by Monsieur Bourdon, who has expressed some things, especially in his first Chapter, so briefly, and yet altogether so fully, as that I thought I could not do better than to Copy after them".[85] Nevertheless, Keill's book sold well.[86] After its initial publication in 1698, it went through a total of seventeen editions, the last in 1771 despite the author's death in 1719.[87] The book was popular at least in part because it was cheap. In John Murray's 1781 catalogue, the 1734 edition was priced at three shillings, whilst the 1773 edition of the *London Catalogue of Books* listed the 1771 edition at the same price.[88] It was cheap because—in the copy I examined at the University of Leeds—it was published in a small octavo and therefore required less paper to print, and because Keill specifically avoided illustrating the work.[89] Rather than in illustration, anatomy was therefore represented in text, and widely circulated. Historiographical focus on

[85] Keill 1698, 7-8.
[86] On the general market for scientific works in the period 1695–1780 see: Walters 2009, 818-826.
[87] All information about Keill's book and its various editions has come from the *ESTC*. On Keill see: Guerrini 1985, 247-266.
[88] Murray 1781, 32; Bent 1773, 127.
[89] Keill 1698, 7-9. On the relation of paper costs to the total costs of printing see: Bidwell 2009, 200-217; Gaskell 1995.

illustrated anatomy works at the expense of non-illustrated ones has therefore amounted to what Raven has called a "cultropomorphic distortion" in the understanding of the development of the anatomical book, as canonical (here illustrated) texts have been prioritised over potentially more popular ones.[90]

As I show in Chapter 3, text-only works of anatomy bore a significant influence on the manner in which *Morbid Anatomy* and its content was presented. In terms of format, Baillie's *Morbid Anatomy* was, like Keill's book, a text-only octavo. It was a little dearer than Keill's book at six shillings, but was nonetheless affordable.[91] This remained an important feature for the presentation of the work. Even as the integration of illustrations into books became more common in the nineteenth century, Baillie's later editions of *Morbid Anatomy* remained text-only. At the same time, Baillie did publish illustrations of morbid anatomy—first in ten parts between 1799 and 1802, and then as a collected work, *A Series of Engravings […] to Illustrate the Morbid Anatomy*, in 1803. Baillie presented the illustrations as part of the same project as his text-only work, but also as a standalone work that did not require the other for comprehension. Despite this, the overall presentation of the works as part of a continuous project emphasises that both books were anatomical—they were both the same kind of work. That is, both *Morbid Anatomy* and *A series of engravings* were works of the same genre; what I term the 'instructional anatomical description'.

This argument serves to unite the study of text-only works with illustrated anatomical treatises at the same time as highlighting their differences. In making this move, I extend Gianna Pomata's concept of the 'epistemic genre', which she argues provides a flexible yet stable way of thinking about the interactions between print and scientific knowledge. It is flexible because individual works in a genre are a single instance among similar works with no one work typifying a genre, and it is stable as the grouping of works by genre ensures that they retain certain distinctive features over long periods of time, though not indefinitely.[92] Epistemic genres are distinct from literary genres as they are "deliberately cognitive in practice", and the texts "are linked, in the eyes of their authors, to the practice of knowledge-making (however culturally defined)".[93]

[90] Raven 1992, 25. See also: Topham 2000, 566-567.
[91] Griffiths (ed.) 1794, 405.
[92] Pomata 2014, 1-23. See also: Pomata 2013, 131-154; Pomata 2011, 45-6-; Pomata 2010, 193-236.
[93] Pomata 2014, 2-3.

It follows from this that works in different genres make different kinds of knowledge. Pomata considers the medical case narrative or history in terms of an epistemic genre. She draws on Andre Jolles's definition of the case as one of the nine 'basic genres' of literature, and John Forrester's claim that "Thinking in cases" is a basic cognitive process common across cultures and time.[94] For Pomata, because the physician's approach to the study of disease was most commonly through cases, they effectively 'thought in cases'. As I have argued above, case histories were the most common way in which disease was discussed in the eighteenth century, which thus promoted thinking about disease in cases. By contrast, Baillie specifically couched *Morbid Anatomy* as a work that was not concerned with cases. Baillie's practice of knowledge-making was therefore disruptive of normal patterns. By publishing a work in a different epistemic genre, that of the instructional anatomical description, he challenged the manner in which medical knowledge regarding disease was acquired. In place of case histories, he actively advocated anatomy. Rather than 'thinking in cases', I argue that Baillie was attempting to realign the study of disease to 'thinking in anatomy'.[95]

For Baillie, publishing an instructional anatomical description necessitated taking on some of the features of that genre whilst avoiding features of the case history narrative. So, Baillie presented lesions as potentially regular—they might be expected to follow certain courses of development—whilst at the same time omitting symptoms and treatments. Most significantly, Baillie avoided narrative descriptions of physicians' practice whilst producing descriptions of morbid anatomy that emphasised topographical features of lesions and the relation to other parts of the body. Compared to the treatment of post-mortem examination in cases—which was part of the overall narrative—Baillie's work was therefore uniquely concerned with the texture of the morbid appearances, which was emphasised by the work's form. This was controversial. Baillie's contemporaries were swift both to criticise this deviation from usual practice and thinking, but also to take on features of Baillie's work for themselves once the work was published. In the case of Samuel Thomas von Sömmering's translation of *Morbid Anatomy*, his work was used by Baillie to greatly expand his own second edition published in 1797 and to include one important feature of case histories that had been missing from his first edition: symptoms. Thus, though genre was a way in which authors could

[94] Pomata 2014, 1-2; Jolles 1968 (2017 translation); Forrester 1996, 1-25.
[95] Ralph O'Connor has argued that the science of geology was promoted and its tenets argued over through the use of different kinds of popular genre for the discussion and circulation of geological knowledge. This conception specifically defines genre in terms of literature, but is a good corroborating example of my overall claim that genre was utilised in the advancement of specific types of scientific endeavour against others. O'Connor 2007, 229-230.

stake a claim about knowledge, this claim was not necessarily fixed, but rather mutable and dependent on the interaction of readers with the work. In Baillie's case, he maintained the argument that disease ought to be studied first through anatomy, in part by publishing anatomical illustrations, whilst at the same time making changes to the text-only work in response to criticism.[96]

Baillie's illustrations were thus a key component of his overall project. In Chapter 4, I examine the making of these illustrations from the original preparations through illustration and engraving, to the printed work. In doing so, I show that their making—and therefore the overall epistemic argument Baillie made in writing on morbid anatomy—was contingent on a series of artisans and artisanal practices, who worked to make the illustrations point to morbid anatomy, rather than simply producing faithful illustrations, in order to fulfil the ostensive function of the work. Together these processes served to transform preparations from three-dimensional entities to a series of two-dimensional lines on a page that were seen to represent the original object. Not only does this emphasise that practices through which illustrations were made were central to representation, it demonstrates that modes of thinking were co-generated between various kinds of objects and practitioner.

Whilst studying the making of books is vital to understanding the generative processes that created argument in text and image, it is only the first part of the process. In Chapter 5 I examine the practice of morbid anatomy in Britain in the early nineteenth century. I argue that authors studying disease used Baillie's work flexibly, and that this worked to promote morbid anatomy as a practical way of studying disease. Much of this practice was related to Baillie's published output. Authors used, quoted, or imported Baillie's descriptions into both surgical and medical works. Relatedly, Bertoloni Meli has recently argued that a number of illustrated works on disease published in the early nineteenth century took inspiration directly from Baillie.[97] I demonstrate that more than inspiration, nineteenth century authors employed and extended Baillie's work and illustrations, which worked to embed morbid anatomy as a practice in Britain.

In examining the interactions between author and readership in such a way, I make use of Robert Darnton's influential notion of a 'communication circuit' of printed works. The circuit is a heuristic for exploring the social and economic interactions between author,

[96] On the importance of illustrations to eighteenth-century anatomy see: Berkowitz 2015b, 171-208; Cunningham 2010, 251-265.
[97] Bertoloni Meli 2017, 107-124, 155-184.

publisher, the trades necessary to print the work, the readership for that work, and back to the author. It emphasises the construction of meaning as resultant from negotiations between all of these various parts of the circle.[98] This has been extended to epistemic concerns by historians of science, and serves here to emphasise the non-linear reception of Baillie's work and its redeployment for various ends in the forty-year period after its initial publication.[99]

0.4: Sources, Methods, and Chapter Outline

Since my concern with the history of pathology, anatomy, and the book in the eighteenth century incorporates a wide range of intertwined theories, processes, materials, and objects, I employ a flexible historiographical approach throughout the course of this thesis. In that regard, I do not have one set of methods or sources on which I draw, but instead draw broadly from medical, book, and art history approaches throughout the thesis. As a result, whilst outlining the shape of my thesis in this section, I also explain my methods and sources on a chapter by chapter basis. As I outlined earlier, this draws on Pickstone's definition of forms of knowledge produced through specific practices as well as recent work in the history of the life sciences that has blurred traditional historiographical boundaries between history of science and art history approaches, which I extend to book history. By exploring a form of knowledge specifically instantiated—morbid anatomy—I demonstrate that anatomical knowledge about disease was produced through a series of interactions with actors, processes, and materials in the eighteenth century. These historical interactions go across traditional historiographical boundaries. Through following them, I make the case for incorporating widened historiographical approaches into the study of forms of knowledge, and thus the study of the history of science and medicine more generally.

The first two chapters are concerned with how Baillie arrived at his specific position on the study of disease through an explanation of the cultural milieu of investigation into disease that was present in the eighteenth century as well as the specific circumstances of Baillie's medical education. In Chapter 1, 'Approaches to the Study of Disease in the Eighteenth Century', I argue that the study of disease in the eighteenth century was characterised by a heterogeneous series of approaches. There was not one discipline of 'pathology', but a number of different and differently motivated investigations into disease. These ranged from theoretical

[98] See: Darnton 1990; Lyons 2010, 6-7; Topham 2000, 562.
[99] See: Topham 2000, 562; Topham 1998, 233-262.

approaches to empirical ones, from chemistry to anatomy, and many points in between. Baillie's anatomical approach was therefore highly unusual, and tied to his education at the Great Windmill Street school. In making this argument I provide a historical and historiographical analysis of a range of individual authors in the period that took specific types of approach. I utilise work by a number of historians on individual practitioners: on chemical approaches I use Rina Knoeff's work on Herman Boerhaave, and Erich Weidenhammer's on Sir John Pringle. On nosology I use Julian Martin on François Boissier de Sauvages, and Rosalie Stott on William Cullen. But I also provide my own historical analysis of the practice of writing case histories in the works of Théophile Bonet, Giovanni Battista Morgagni, and Joseph Lieutaud, as well as outlining the relation of anatomy to the study of disease for William Hunter and Baillie as it was discussed in their respective introductory lectures to their courses.

Chapter 2, titled 'Collecting Anatomy and Making Knowledge about Disease at Great Windmill Street', examines the practice of anatomy at Great Windmill Street, and its effect on Baillie's study of disease. It does so through a focus on how Hunter's anatomical inquiry related to his pedagogical practices, and how, in turn, those practices shaped Baillie's interaction with anatomy and disease at the school. Building on Cunningham's argument that anatomy was an experimental discipline in the eighteenth century, I examine the way in which Hunter used preparatory techniques to experiment with the cadaver in order to create anatomical knowledge. I do so by means of examining Hunter's papers and documents related to his teaching at the school. These include his published *Two Introductory Lectures*, which documents important aspects of the school's organisation, as well as lecture notes by former students. I show that anatomical knowledge was gained experientially through the senses, and required interaction by the anatomist with a series of tools, materials, and processes intended to reveal the body's structure to sight and touch. By examining a guide to creating preparations contemporary to Hunter, I emphasise that these processes were contingent on craft practices that incorporated a significant amount of organisation, a broad range of skills, and the 'sensitising' of the practitioner to understand the relations between materials and their effect on the body.

Despite this complexity, Hunter taught his methods to students at the Great Windmill Street school, training them through display and providing bodies on which they could place their own hands. Baillie soon became expert in these methods, and was tasked with cataloguing preparations of disease by Hunter. Specifically, Baillie wrote a document now housed at the University of Glasgow Special Collections that listed new additions intended for Hunter's

museum collection, most of which were of diseased appearances. The document shows that the training he received extended to organising and producing descriptions of preparations demonstrating diseased structure. This involved describing the visual and tactile features of preparations, as well as creating generalised descriptions of the anatomical information conveyed by a number of similar preparations. These skills were central to the manner in which Baillie utilised Hunter's and his own collections in writing *Morbid Anatomy.* By comparing aspects of Hunter's museum collection through his catalogue (also held at the University of Glasgow) and Baillie's own (at the Royal College of Surgeons) and *Morbid Anatomy*, I show that the collections were the material basis for the work. The knowledge he communicated in the work rested on practitioners' experience with the cadaver preserved in text and object at the Great Windmill Street school.

After Baillie had undertaken his inquiries into disease, he worked to publish his findings. The next two chapters examine how Baillie went about doing this in text and image, and the effect this had on his presentation of morbid anatomy as a viable practice for the study of disease. Chapter 3, 'Publishing Morbid Anatomy and Publishing *Morbid Anatomy*', focuses on Baillie's publications prior to *Morbid Anatomy* as well as the publication of the work's first and second editions. Primarily, I examine these publications through the concept of 'epistemic genre'. I begin by examining Baillie's early papers. Baillie's first publications were on disease and written as cases, even though there was little narrative content regarding the patient encounter available to Baillie. This was a reflection of the audiences for his work, for whom writing in cases was the usual approach to the study of disease. By contrast, *Morbid Anatomy* was an anatomy book on the subject of disease, and therefore challenged normative practice of the study of disease.

Baillie's presentation of morbid anatomy was influenced by his teaching at the school, which I briefly examine, and other works of anatomy such as Hunter's *An Anatomical Description of the Human Gravid Uterus* (1794) that Baillie published on his mentor's behalf. I emphasise that there were striking similarities between Hunter's and Baillie's work which demonstrates that Baillie purposefully took on the features of anatomy books for his own work, both to represent it as anatomical, but also to ensure it was intelligible to contemporaries, for whom Baillie's approach was new. But this new approach came under criticism in Britain, specifically for omitting cases and symptoms. Meanwhile, Samuel Thomas von Sömmering appreciated the structure of Baillie's work, but thought the content needed improvement, and produced a translation into German in 1794 that he saw as doing this work. I show that Baillie

took on aspects of these criticisms in order to improve the work for his second edition published in 1797. Using the freely available software programme Juxtacommons, I compare the first and second editions alongside a translation of Sömmering's first chapter kindly provided by Ian Avery.[100] In doing so, I demonstrate that Baillie incorporated changes based on the criticism he received—most notably through the inclusion of symptoms—but did so in a way that maintained the original purpose, and genre, of the work. Genre was thus an important consideration in the communication of knowledge in this period.

Chapter 4, 'Illustrating Morbid Anatomy, Making *A Series of Engravings*', shows that Baillie's production of illustrations for *A Series of Engravings* was continuous with his goals in publishing morbid anatomy, but that in the making of images of diseased appearances, Baillie had to meet new epistemic challenges related to image-making. Most significantly, the presentation of singular illustrations of individual anatomical preparations as representing an entire class of similar objects required justification in order for the image to be seen to properly represent anatomical knowledge by fellow practitioners. Baillie rhetorically appealed to the standards related to what Daston and Galison have termed 'truth-to-nature'. These standards emphasised fidelity to the original object alongside the author's judgement in selecting appropriate objects for representation. However, this had the effect of obscuring the work of image-makers on whose skills these claims rested. I therefore examine each stage of the making process, from the anatomical preparation through the illustration, engraving, and finally printed image to emphasise that the epistemic justification of 'truth-to-nature' rested on actors and practices related to making images.

In comparing each stage of this process, I unite all of the stages of Baillie's image-making for the first time: Hunter's preparations are held at the University of Glasgow's Anatomical Museum, some of the watercolours and all of the copperplates at the Royal College of Physicians, while the book is available online and at various university libraries.[101] I demonstrate that Baillie's artist, William Clift, employed watercolours in order to produce suitably natural representations of the preparations, his own expertise being vital to the appearance of the images, which he worked to enhance. Similarly, Baillie's engravers, William Skelton, James Basire II, and James Heath, were experts at translating the work of the draughtsman into a series of grooves on a copperplate that would print an accurate

[100] My thanks to Ian Avery for this. Using freely available software is considered best practice in digital humanities scholarship.
[101] The remainder of the watercolours are likely in Melbourne.

representation. This expertise was vital for the presentation of anatomical knowledge within illustrations and fundamentally shaped its epistemic content. Thus Baillie, and other authors, worked collaboratively with artisans who in turn worked to enhance the epistemic credentials of the work, and simultaneously Baillie's claims to truth-to-nature.

What effect did this work have? In Chapter 5, 'British Morbid Anatomy in the Nineteenth Century', I argue that Baillie's work helped to initiate a particular British approach to the study of disease in the early nineteenth century that was parallel with developments on the continent: morbid anatomy. This approach was overtly practical, and was different from French approaches, though the two interacted. Furthermore, morbid anatomy was promoted as part of a wider conservative reform agenda that maintained the hierarchy of British medicine at the same time as attempting to improve its practice, which in the study of disease centred around the founding of the Medical and Chirurgical Society (later Royal Society of Medicine). In making this argument I move away from examining Baillie's work and investigate the use of that work by other authors. Through making judicious and extensive searches of various online databases such as Eighteenth-Century Collections Online, Hathi Trust, COPAC, and archive.org alongside examining books housed in the Special Collections at the University of Leeds and the University of Bristol I have identified three key areas in which Baillie's work was employed by his contemporaries. First, Baillie's work was used in other authors of both medical and surgical texts as a key source of information or as an example to emulate. Second, Baillie's illustrations became the model for further illustration of diseased appearances in books and periodicals now made using new printing technologies. Third, courses of anatomy began to incorporate morbid anatomy as part of the study of anatomy across Britain. Baillie's work was thus taken up and, crucially, extended in order to form a specifically British approach to disease in the early nineteenth century.

In the conclusion to the thesis, I link the three main historical and historiographical stands of the thesis, discussed in this introduction, to wider concerns in the history of medicine and history of science. I end the thesis by outlining two further historical projects that I see as suggested by the conclusions and methods of my own thesis. The first is to further explore British morbid anatomy as a practice in the nineteenth century. This would both clarify its role alongside Parisian medicine, and also outline an international context for the development of anatomical approaches to the study of disease in this period. The second is the interrogation of the role that text-only works of anatomy had in the history of anatomy more generally, working

to incorporate their significant popularity alongside more rarefied, illustrated works of anatomy generally examined by historians.

Chapter 1: Approaches to the Study of Disease in the Eighteenth Century

In the eighteenth century, there was not a discipline of pathology that helped to unite practitioners as there was for anatomy.[102] Instead, there were a variety of projects that employed a number of methods to investigate disease for different purposes. Projects might prioritise the intellectual understanding of disease as primary to its study: for example, nosology aimed at better defining diseases in order to aid their conceptions and therefore their understanding. Or, the study of disease might be rooted in practice: as I demonstrate here, the pursuit and organisation of anatomical study at the Great Windmill Street school fundamentally shaped Matthew Baillie's study of disease through the practice of anatomy. Alternatively, disease was studied through a mixture of intellectual commitment and empirical endeavour: chemical approaches typically combined observation and experiment with reasoning on theory. But perhaps the most important way of approaching the study of disease for physicians in the eighteenth century was the production of case histories: written accounts of patient encounters whose analysis pointed directly towards improvement in points of practice. In this chapter, I argue that there were a number of alternative and, at times, competing approaches to the study of disease in the eighteenth century, of which anatomical approaches were only one. I do so through the analysis of four major undertakings in the study of disease in the eighteenth century, and their major practitioners, which constitutes the four sections of this chapter: the writing of case histories (Théophile Bonet, Giovanni Battista Morgagni, and Joseph Lieutaud), the chemical study of disease (Herman Boerhaave and Sir John Pringle), the creation of nosologies (François Boissier de Sauvages and William Cullen), and anatomical approaches (William Hunter and Baillie). The chapter thus emphasises a European-wide heterogeneity to the study of disease.

In order to do so, I examine both pedagogical and experimental *projects* that were variously concerned with anatomy and cut across the boundaries through which I examine them. Boerhaave (1668–1738) and Cullen (1710–1790) were two of the most influential medical teachers of the period, and bookended the century. Teaching at the universities of Leiden and Edinburgh respectively they articulated full medical systems through which huge numbers of students learnt medicine. Both were medical chemists and both were especially

[102] On anatomy as a united discipline in the eighteenth century see: Cunningham 2010.

concerned with the practice of the physician. Cullen, however, represented himself as in direct opposition to many of Boerhaave's teachings in both physic and chemistry, creating a new medical system at Edinburgh that challenged many of Boerhaave's teachings. Pedagogical projects like Boerhaave's and Cullen's are especially useful for our purposes as they clearly articulated their principles, as well as tying their teachings to practice. In that regard it is especially instructive that neither Boerhaave or Cullen were particularly concerned with anatomy in pursuit of knowledge about disease. This was especially true of Cullen, who produced a symptom-based nosology and taught primarily to aid the understanding of the causes of disease. There was another important point of unity between Boerhaave and Cullen in their method: it was primarily theoretical and academic, what Cunningham has termed 'library pathology'.[103] Both Boerhaave and Cullen advocated reasoning on disease in order to understand it. For both this stemmed from their shared attitude towards how the study of physiology ought to be undertaken. As Cunningham has shown, physiology was a theoretical discipline in the century, undertaken with the pen and the mind.[104] Disease was widely understood as a deviation from normal function, and was therefore potentially intelligible through physiological methods. Academic theorising on disease in the manner of physiology was a widespread practice and crossed nominal boundaries such as those between the sections of this chapter. As the temporal distance between Boerhaave and Cullen shows, library pathology persisted throughout eighteenth-century medicine alongside other practices. 'Theorising' is therefore a central theme in this chapter across a range of different projects.

This theorising could take different forms. The creation of nosologies, works that classified disease using a taxonomic system, became a burgeoning way of intellectually engaging with disease to improve understanding of it in the period. Cullen, as I have mentioned, created a nosology for the use of his students. This was a simpler organisation of diseases by symptoms than that of Sauvages (1706–1767). Sauvages created a sophisticated, theoretically-informed classification of diseases based on botanical arrangements and aimed at ultimately producing a philosophical understanding of disease. The importance of this project here is that Sauvages viewed his work in the library as potentially benefitting medicine practically: by knowing the defining symptoms and signs of diseases, therapeutics would benefit in due course. Theorising was viewed a powerful tool for the physician in the improvement of medicine.

[103] Ibid., 190.
[104] Cunningham 2002, 631-665.

But such work did not preclude practical enquiry into medicine. Indeed, Boerhaave was a particular advocate of studying the body's fluids, encouraging the growing field of medical chemistry in this period.[105] Sir John Pringle (1707–1782), a former student of Boerhaave's, took on this encouragement and had an exemplary career as a medical experimenter, becoming President of the Royal Society. His work *Observations on the Diseases of the Army* (1752) was a key text in promoting the nascent field of military medicine which was especially concerned with keeping the troops healthy. Pringle was in many respects a follower of Boerhaave, but he advocated a different position to Boerhaave with respect to the process and role of putrefaction in disease, in part due to his experiments. Pringle's challenging of Boerhaave was also based on theoretical grounds however, which helps to emphasise the interlinked relation between empirical knowledge and theorising on the body in this period. Medical chemistry was an important empirical field through which disease was investigated in the period and it was not necessarily anatomical, but it could be.

There were, however, projects more sympathetic to the role of anatomy in the study of disease. Those writing case histories often incorporated accounts of post-mortem examination in their narratives. Bonet (1620–89) produced a work that listed all the cases he could find in the literature where post-mortem examination had taken place. This allowed him to correlate the findings at post-mortem with the symptoms the patient had presented with in life. But Bonet did so on an individual basis. Morgagni (1682–1771) synthesised *series* of cases in order to investigate disease. Morgagni's *De sedibus et causis morborum anatomen indagatis* ('On the seats and causes of disease investigated through anatomy' 1761), has traditionally been seen by historians as a work of pathological anatomy, and indeed, the work had an important anatomical aspect. But I argue in this chapter that the most important practical aspect of Morgagni's work was the *textual* exploration of disease for a variety of purposes such as diagnosis and prognosis, as well as anatomico-symptomatic correlation. In that regard, in terms of analysis, Morgagni's work was a traditional library-based project grounded in texts, but one that had an unusual focus on anatomical findings. The work's scope and ambition set it apart from its contemporaries, but such work was longstanding in medicine, as demonstrated by the huge number of case reports which included post-mortem examinations that Morgagni made

[105] I use the term 'chemistry' to refer to the experimental and theoretical investigation into fluids and airs throughout this period for ease of reading. I acknowledge that historians of chemistry have identified significant changes in attitudes in chemical investigation around the turn of the eighteenth century and later in the century such that three distinct terms have been employed to refer to these periods: alchemy, chymistry, and chemistry. I use only the latter here in order to avoid confusion. See: Principe 2007, 1-22.

use of from other practitioners alongside his own. Lieutaud (1703–1780) undertook a similar project to Morgagni's in terms of study, but presented his findings in a very different way to ensure that his work was practically useful. Amongst other presentational techniques, he presented the various narrative features of case studies separately making each stage of the case clear for the reader. This contrasted to Morgagni's work, which though an important source of knowledge for practitioners, was not easily accessible.

Alongside these developments, a different kind of approach to the study of disease was developed at the Great Windmill Street school: morbid anatomy. Samuel J.M.M. Alberti has termed such work 'museum pathology', which is a useful way of distinguishing the very practical work done at the school from more overtly theoretical methods of investigating disease.[106] This did not displace other kinds of practice in the eighteenth century, but by the early nineteenth century it was the main way of pursuing the study of disease in Britain. The school run by Hunter (1718–1783) was first and foremost an anatomy school. The intellectual and organisational commitments of Hunter were vital in shaping Baillie's later articulation of morbid anatomy and his views on the relation of the study of the diseased body to the practice of medicine. Hunter emphasised to his students that anatomy was the only reliable basis for physiological theorising. This material basis encouraged Hunter to organise the preservation of thousands of anatomical preparations at the school, which were collected wherever and whenever possible. As a result, Hunter's collection expanded in unexpected ways, such as in preparations of diseased parts. As teaching was intimately linked to the collection, Hunter created separate lectures on diseased appearances based on this collecting. For Baillie, who joined the school late in Hunter's career, these developments emphasised two points that were central to the development of morbid anatomy: (i) morbid anatomy was a separate subject from regular anatomy, and (ii) morbid anatomy could act analogously in the pursuit of knowledge about morbid action just as anatomy worked to help understand physiology. This conception was very different to the manner in which dissection served the study of cases—primarily as part of anatomico-symptomatic correlation—and emphasises that morbid anatomy was a separate pursuit in its own right.

The chapter therefore demonstrates that Baillie's work was the product of a specific context that prioritised anatomical investigation and encouraged theorising only after empirical observation. But it also emphasises that this context was not the prevailing one in which disease

[106] Alberti 2011. See also Bertoloni Meli 2017, 211-212.

was studied. Rather than being the main area where the study of disease developed in the eighteenth century as historians have assumed (see Introduction), anatomical investigation of disease was in fact a relatively minor practice. By contrast, the dissection of diseased cadavers was a more widespread practice that was one aspect of producing case history narratives which focused on the physician's practice. Baillie's conception of morbid anatomy was thus significantly different to the practice of making cases both in terms of what his practice focused on (only dissection) and in terms of its epistemic claims (anatomy was the best way of studying disease). At the same time that Baillie expanded the scope of the investigation of diseased cadavers through focusing on lesions in his work to an extent rarely done previously, he shifted concern with the course of diseases to morbid action—the actions of the body in disease inferred from changes in the structure and texture of the cadaver. Patients were not in this picture. Similarly, Baillie was circumspect regarding theorising about disease. Instead of theorising with pen and mind in the manner of physiology, Baillie saw the investigation into lesions and their appropriate categorising as key to understanding disease—and theorising was to be done from this basis only, with great care.

In the course of this chapter I rest some of my analysis squarely on the existing literature. For my discussions of Boerhaave, Pringle, Sauvages, and Cullen, I largely follow the work of historians Rina Knoeff, Erich Weidenhammer, Julian Martin, and Rosalie Stott on each protagonist respectively. Their individual study of each has brought out the subtleties of their respective projects and positions, and serves to provide a well-confirmed bolster to my claims regarding anatomy and disease in the period. This is especially important in regard to the attitudes of these individuals to anatomy. All of them advocated that the dissection of diseased cadavers was important, but none of them prioritised it. Other theoretical, chemical, and classificatory concerns were primary for their projects. By contrast, on the subjects of case histories and anatomical investigation I briefly evaluate the existing historiography in order to clarify my overall argument regarding the relation of anatomy to the study of disease in the eighteenth century. This is especially important because in their respective projects, anatomy was indeed highly significant. However, as I argue throughout this chapter, anatomy was not straightforwardly important, and nor was it simple as to *how* anatomy was important for eighteenth-century medical practitioners.

1.1: Case Histories Incorporating Post-Mortem Examination—Bonet, Morgagni, and Lieutaud

The writing of case histories was a common undertaking for physicians in the eighteenth century. This was a primarily textual study of disease through the production of narratives regarding interactions with patients. Depending on the specific features of cases, physicians explored various issues relating to practice, most commonly symptomatology incorporating diagnostics and prognostics, therapeutics, and post-mortem examination typically with the purpose of correlating findings made in the cadaver with the patient's symptoms—anatomico-symptomatic correlation. The particular advantage of case histories was that they could be analysed for a variety of purposes and on a number of different levels. In the first instance, a single case history was a record of physician's practice at a specific point and so could be analysed in itself—such was often the case for findings of singularities such as 'monsters'.[107] In the second, though a physician might write a case history aimed at improving the treatment of a particular disease, a different physician might value the description of post-mortem findings made available by the former. More commonly, cases were compared and contrasted to other cases in the literature to further improve knowledge.[108] Moreover, in exceptional circumstances cases were the basic unit for a systematic and wide-ranging analysis of disease, such as in Morgagni's *De sedibus* which was particularly concerned with the seats and causes of diseases. Many, perhaps most, case histories written in the eighteenth century were published in periodical publications, and we will encounter a number of examples of such throughout the thesis. In this chapter, I focus on three books that collated case histories with a particular focus on incorporating post-mortem examination: Bonet's *Sepculchretum sive Anatomia Practica* (1679), Morgagni's *De sedibus* (1761), and Lieutaud's *Historia anatomico-medica* (1767). I argue that because of the three works' concern with cases, they were all primarily textual explorations of disease. Especially in the context of historiographical work on Morgagni, whom I particularly focus on, this may seem surprising. But I argue that though his work centrally incorporated post-mortem examination, this was done with the purpose of exploring disease textually. This kind of approach to the study of disease was prevalent throughout the eighteenth century, and was fundamentally different from the practice of morbid anatomy articulated by Baillie, explored in section 1.4.

[107] The term 'monster' referred most often to what we would now term congenital birth defects. Palmira Fontes da Costa has shown that they were of particular interest to the Royal Society in the eighteenth century, with cases often appearing in the *Philosophical Transactions*: Fontes da Costa 2002, 265-288.
[108] Pomata 2014, 1-23.

Bonet's *Sepculchretum*—translation: 'necropolis'—was a collection of around three thousand cases of illness where he could find evidence of post-mortem examination. These were culled from other medical authors, which naturally led to variability in the quality of what was reported (Cunningham refers to the cases as "reports", which he states "make his example sound far more systematic than they were"). Post-mortem descriptions were printed at length and Bonet incorporated scholia discussing important aspects of individual cases into his work, especially regarding the cause of disease and its cure, glossing interesting details. The work was very large, running to three volumes, and dealt with disease from head to toe—the traditional, Galenic sequence for dealing with disease.[109] Though certainly imperfect, the work provides an important insight into the undertaking of post-mortem examination by physicians in the late-seventeenth and early-eighteenth centuries, not least due to the evidence it provides regarding the widespread undertaking of the practice—over three thousand cases! More importantly, it was a major inspiration for Morgagni's work, who viewed it as excellent in concept but poor in execution. Here I briefly outline an example from *Sepulchretum* translated by Cunningham that shows the work's method and scope. Later I do the same for Morgagni in order to emphasise the later author's much wider scope and ambition.

Bonet's entry for "Pain in the head from overfullness of the meninges; a mass of fluid in the ventricles" gave a single case of a thirty-five-year-old tailor, who was quick to rage and after "grave" pain in the head, with a melancholic pulse but without fever and otherwise healthy, was sleepless, occasionally delirious, then slept deeply for three to four-hour periods after which there was no pain. He died after fourteen days. The doctor, F. Illmerus of Wartenberg thought a cold abscess was present. The post-mortem found turgid vessels in the meninges, eight ounces of fluid in the ventricles, and a slightly white choroid plexus. Otherwise everything else was unremarkable. After these observations were laid out, Bonet provided a scholium that attempted to draw conclusions from these findings by correlating them. This case had five key points. Bonet began guessing what the initial internal action that led to the pain in the head was caused by (1): "I judge that either the lymphatic vessel or some capillary blood vessel has broken, *on account of* the excess anger". This cause was then linked, through a supposition (2), to an anatomical finding (3): "in which [vessel] the ebullient humours, propelled in too great quantity, have distended the smallest vessels". Bonet then explained the effect of this distension (4), with reference to the anatomical findings, linking it back to the symptoms of the patient (5): "and by affecting a small area have broken through the vessels;

[109] Cunningham 2010, 192.

whence the small transudations of fluid, by filling, distending and pressing on the particular vessels and cavities of the brain, have caused these symptoms".[110] Bonet thus attempted to link two kinds of phenomena that had been observed in the patient—symptoms whilst living, lesions when dead—in order to explain the course of the disease in that case through text. This anatomico-symptomatic correlation had the ultimate goal of improving therapy for similar cases, and was grounded in reasoning upon written text. In this case, the pain in the head was a symptom caused by excessive anger breaking key vessels and allowing fluid to press on certain parts of the brain, which the title of the case identified for the reader as the ventricles of the brain. Bleeding was therefore attempted, though it was unsuccessful in curing the patient.[111]

But it was only in this case that such a conclusion could be drawn. Bonet treated each case individually, providing individual conclusions to each. Morgagni viewed this as inadequate, and conceptualised his own work as an improvement of Bonet's. For Morgagni, the inadequacy of Bonet's work lay in its reliance on suppositions, its omissions and repetitions, its incorrect identification of diseased appearances, the "useless" scholia, and indexes that did not sufficiently help the reader to navigate the book.[112] He resolved to do the task better. But the scope and ambition made Morgagni's work almost unrepeatable, despite its well-accepted utility.

Morgagni is perhaps the medical author with the most notable, though historiographically confused, legacy in study of disease in the eighteenth century. *De sedibus* is typically seen as a work on pathological anatomy. Cunningham argues that Morgagni turned "the anatomical theatre into a pathological anatomy theatre", and Porter describes the work as shifting the study of disease "from symptoms to site".[113] Relatedly Morgagni has also been described as playing a key role in "overturning the humoral theory"; his work representing "the apogee of writings by adherents of the 'solidist' movement in medical thought"—the idea that all diseases stem from the solid parts of the body, and are thus best investigated by anatomy.[114] It has also been noted that Morgagni was seen by those ensconced in French clinical medicine

[110] Bonet 1679 quoted in Cunningham 1996, 48-49 emphasis mine.
[111] Cunningham 1996, 49.
[112] On reading the work Morgagni stated: "I did not even then despair, but if I should have sufficient leisure in future time, I should not only be able to supply the deficiencies I have pointed out in the Sepulchretum, and others besides these, but also that I should be able to reform the indexes". Morgagni 1769, xix.
[113] Cunningham 2010, 210; Porter 1997, 264.
[114] Quotation from: Schutta 2009, 12, 21. He specifically argues against: Mettler 1947, 252.

of the early nineteenth century as a notable precursor to their work, which was indeed particularly concerned with pathological anatomy.[115]

But Morgagni's work, like Bonet's, was primarily a *textual* exploration of disease through case histories. It had a major anatomical element, but this aspect of the work was not as important to contemporaries as historians have emphasised. As we have seen, many of Morgagni's contemporaries analysed their own work through cases incorporating post-mortem examination. Moreover, Morgagni's practice of dissection worked to produce text. This continued the work of the Italian tradition of experimental anatomy initiated by Marcello Malpighi, that Morgagni undertook first with his mentor, Antonio Maria Valsalva, and then alone for over sixty years.[116] Dissection was vital for the content of *De sedibus*, but what has been largely ignored by historians is the manner in which Morgagni recorded the findings of those examinations: *in text*. Highlighting this may seem far too obvious a point, but when considered alongside contemporary developments in preserving human tissue (see Chapter 2) it becomes significant.[117] Morgagni's most important inheritance was that of the case histories of Valsalva—textual accounts of patients' symptoms, treatment, the development of their illness, death, and post-mortem findings. This was exactly what Morgagni recorded in pen and ink from his own cases and autopsy work. Morgagni's practice was to write down observations at each point of seeing the patient, in order to be able to compare them with other written accounts. Such practice was first and foremost textual, had originated in the form that Morgagni practised it in the seventeenth century, and was therefore influenced by other textual inheritances of seventeenth century medicine.[118]

Moreover, post-mortem examination of diseased cadavers was just one aspect of Morgagni's work, and he did not have a wholly anatomical view of disease. Henry S. Schutta has convincingly argued against the traditional view that Morgagni work represented the 'apogee of solidism' and the overturning of humoral theory. He observes that Morgagni's

[115] Foucault sees a "period of latency" between Morgagni and Auenbrugger and Bichat and Corvisart, and furthermore speaks of a "return to Morgagni" in this later period. Foucault 1963 (1989 translation), 155.
[116] Cunningham estimates that Morgagni dissected around 700 corpses in this time, the rate of around one per month. Cunningham 1996, 37.
[117] Morgagni had certainly seen, at the very least, a preparation of the American John Morgan, who showed Morgagni a kidney preparation made using the new corrosion technique that Morgan had invented during his visit to Morgagni on a Grand Tour. Morgagni was 'very excited' by the technique. Cunningham 1996, 39-40. Similarly, Morgagni would have been aware of the various efforts to create wax anatomical models that were popular on the Italian peninsular during the century (see Introduction).
[118] Hess and Mendelsohn have outlined what they call 'humanist textual methods' that helped to form and shape knowledge from the seventeenth century. Hess and Mendelsohn 2010, 287-314; Hess and Mendelsohn 2014, 471-503.

explanation of the mechanism of apoplexy (stroke) and his recommendations for treatment "relied on tenets derived from humoral theory".[119] In certain respects, Morgagni's thinking on disease remained humoral, belying the idea that the study of disease was only an anatomical pursuit for him. For example, he stated that "it is not contradictory to suppose that one and the same humor should sometimes bring on epilepsy and sometimes apoplexy", the humors not investigable through anatomy.[120]

The idea that Morgagni shifted the study of disease 'from symptoms to site' or changed the nature of the anatomy theatre to a pathological anatomy theatre does not hold up to scrutiny then. The historiographical focus on disease becoming 'more anatomical' during the eighteenth century (discussed in the introduction to the thesis), as well as an emphasis on the part of Morgagni's title that claimed disease was being 'investigated by anatomy', has led to Morgagni's work being understood in this frame. Certainly, Morgagni's vast post-mortem experience was unusual by the standards of the seventeenth century and he did contribute to contemporary developments in that regard, but *De sedibus* was instead primarily a textual exploration of the first half of the title of the book: the seats and causes of disease. This purpose required Morgagni to pursue anatomico-symptomatic correlation as Bonet had. Morgagni's resolve to improve on Bonet's work led to his pursuit of anatomico-symptomatic correlation being far more rigorous and systematic than that of his predecessor, as I now demonstrate.

De sedibus was made up of five books of letters discussing diseases from head to toe, as *Sepulchretum* had. Each letter was concerned with a specific disease defined symptomatically. Typically, letters introduced a number of cases originating from Valsalva's writings, raised points of contention, and attempted to solve those points through detailed comparison and consideration of other anatomists' writings. Morgagni then introduced a number of his own cases before doing the same again. The case histories of Valsalva and Morgagni, incorporating their post-mortems, were key pieces of evidence. But their main role was to provide a firm empirical grounding for a systematic textual analysis of the literature. As Adrian Wilson has observed:

> [Morgagni] was a master of analytical exegesis in three distinct domains: symptomatic, anatomical and textual. And the signal achievement of *De sedibus* was that it *united*

[119] Schutta 2009, 22.
[120] Morgagni quoted in Schutta 2009, 22. Despite Schutta's useful intervention in the debate, there are problems with its framing. The term 'solidism' is anachronistic when applied to Morgagni as it was coined in the mid-nineteenth century. Even if we accept such a characterisation, clearer exemplars of the term exist in the eighteenth century in the form of the Hunter brothers and Matthew Baillie.

> these three layers or dimensions: that is, Morgagni systematically correlated (i) symptomatology with (ii) anatomy, meanwhile interweaving (iii) previous discussions of the disease in question.[121]

At all of these layers Morgagni was dealing with various textual traditions. Symptomatology was necessarily textual, as was much previous discussion of disease, and the diseased appearances revealed by anatomy used in *De sedibus* were too—as in Bonet's work they were made up of the testimonies of other practitioners printed in books, or they were comprised of Valsalva's or his own case notes, which were written down.[122] Morgagni's work was thus, as Wilson claims, one of analytical exegesis, but furthermore, this exegesis was within a tradition of case histories being pursued by the hundreds of doctors who had published such case histories in the preceding 150 or so years. A short example will help to demonstrate that anatomico-symptom correlation in Morgagni's work was a textual pursuit, despite the historiographical focus on his post-mortem work.

The first letter in the work was on "Pain in the Head". Morgagni began the letter by stating that pain in the head was rarely fatal, and that he was not concerned with all causes of pain in the head, only those where it was a preceding disorder, or particularly threatening symptom presented by a patient (Letter I. Part 1). The first three cases of Valsalva all had "serum" or "water" as significant morbid findings, but with slightly different parts of the brain affected (water being found around the optic nerve (I.2.), pituitary gland, mammillary process (I.6.), and infundibulum (I.7)). These findings, along with an example given by Petrus Borellus (Pierre Borel) in *Sepulchretum*, were used to argue against the assertion of Archangelous Piccolhominus (Archangelo Piccolomini) that pains felt in the upper and lower cerebrum are seated only "in the pia mater, which invests the lateral ventricles of the brain". Rather the cases of Valsalva and the concurring case of Borellus indicated that the seat of pain in the head was larger than just this area. Indeed, the seat incorporated Piccolhominus's assertion, going deeper in the brain towards the eyes from the lateral ventricles. Consistent across all of these parts, however, was the fact that they were "invested in the same membrane", the pia mater.[123] After making this point Morgagni introduced two further cases from Behrensius and Preussius that enabled him to extend the claim about the pia mater to the rest of the meninges (made up of the dura mater, arachnoid, and pia mater). Morgagni then reported with approval Pressius's

[121] Wilson 2000, 299 author's emphasis.
[122] The claim that anatomy was pursued largely textually until the early-eighteenth century could be made more general than is being claimed here, though it outside the scope of the current purpose.
[123] Morgagni 1769, 3-6.

discovery that if pain in the head was on one side alone, only the lateral ventricle on that side would be distended with fluid.

In I.7 Morgagni gave two potential causes of pain in cases like those discussed: "[either] the irritating nature of an extravasated humour, or […] a quantity of the same preternaturally overloading and distending it". On the former, Morgagni cited a number of concurring writers (Pressius, Cohausenius, Jo Francus) and then left the subject.[124] Distension of parts caused by fluid build-up then became a theme throughout the rest of the letter.

The next two sections were devoted to disproving the idea that pain in the head was caused by spontaneously generating worms or scorpions (or the like). Morgagni linked worms found in the skull to flies.[125] After this Morgagni introduced three of his own cases, which he used to reemphasise that pain in the head was seated in the meninges. But he shifted the focus of his analysis to the influence of obstructed blood flow on pain in the head. He provided cases where obstructed blood flow led to a pounding in the head—known as percussion—was seen as the cause of the pain. He gave two different cases: one where blood flow was obstructed in the head (I.10), and another where blood flow was (likely) obstructed in the body (I.12), before providing a case that had many of the key features of all the previous cases including a misshapen head (I.14). He concluded (I.15) that the dura mater's coalition with the skull (as in I.10) accounted for the pain, and he went on to explain how such coalitions that impeded blood caused pain in the head (I.16). As blood went through obstructed sanguiferous arteries it distended the vessel and increased "the strokes of the vessels". The pressure of arterial pulsation in the meninges was greater due to the transit of blood being more difficult, which created the pain. Morgagni cited Brunerus as making a similar observation (though he limited his comments to distension, not percussion). He then cited two further cases (of Cowper and Bajeres) that concurred with the case in I.14, as they showed that a great quantity of blood distending the vessels in the skull created pain in the head (I.17).[126] Finally, as a concluding comment, Morgagni noted that information from his own and Valsalva's cases irrelevant to the disease in question would become relevant elsewhere, to be discussed when relevant. He then reemphasised that pain in the head was usually complicated with other disorders (I.18).[127]

[124] Ibid., 6-7.
[125] Ibid., 7-11.
[126] Ibid., 11-16.
[127] Ibid., 17.

From this brief gloss it is possible to see how *De sedibus* was significantly different from the *Sepulchretum.* Recall that Bonet's example saw pain in the head as a symptom caused by fluid pressing on the ventricles of the brain, which had in turn been caused by the tailor's anger breaking key vessels, either lymphatic or blood vessels. Morgagni agreed with much of this—the cases of Valsalva and accompanying commentary concluded that serum or water could irritate parts or cause pain through distension; blood vessels could play a key role in pain in the head. But Morgagni extended Bonet's conclusions such that the link between the two works is almost unrecognisable. Morgagni was more precise than Bonet on the seat of pain in the head in cases where serum or water has built up (anywhere invested by the meninges). He added Pressius's discovery regarding pain in one side of the head, discussed in detail the nature of the fluids and what effect that has on pain in the head (any fluid can cause pain no matter how "limpid"), and admonished those who thought worms might be the cause of pain in the head (in fact many of Morgagni's examples of practitioners stating this were taken from *Sepulchretum*). He discussed the effect of birth defects (misshapen heads), added coalition of the dura mater to the skull as a cause of pain, thus uniting different anatomical causes with a single symptom, and discussed in detail the effect that a distension of blood vessels might have regarding pain in the head. This huge expansion of both concern and conclusion regarding pain in the head was due to the systematic comparison of several cases at once, where Bonet only examined one at a time. This may well be why Morgagni viewed Bonet's scholia as "useless"—Bonet's discussion of singular cases were insufficiently robust. On this gloss Morgagni's own commentaries might be seen less as scholia and more as synthesis—an attempt to reconcile all the available evidence on disease in a systematic manner in order to generate conclusions about disease like those outlined above.

These conclusions were generated through the examination of written case histories, both from the literature and his own and Valsalva's. Morgagni's method of anatomico-symptomatic correlation was unusually intricate, and balanced between competing goals—incorporating this, dismissing that, emphasising the other. But at its heart it was concerned with similar questions to that of Bonet: What was the seat of this particular disease? What were its attendant symptoms? What might the narrative of cases and the findings at post-mortem tell us about these questions? Crucially, this exercise was at its core textual. *De sedibus* was textually focused, just as it had been textually formed.

Lieutaud's work was similarly focused and formed to Morgagni's, but quite differently presented. His *Historia anatomico-medica* consisted of over 3,500 cases drawn primarily from

Bonet and Morgagni. It has thus been seen as a summary of the two authors' work, and lacking in original cases.[128] But it contained a substantial number of Lieutaud's own cases, numbering around 150. However, the most significant feature of Lieutaud's book was its organisation. The text was organised anatomically—the first chapter had separate sections on the peritoneum inflamed and the peritoneum gangrenous for example.[129] Unlike in *De sedibus*, Lieutaud presented symptoms, post-mortem findings, and individual cases separately. Finally, the index was organised nosologically by Lieutaud's pupil, Antoine Portal who would much later become a prominent member of the French 'clinic'. The clear organisational structure that contained a clear contents page, headings, subheadings, the numbering of observations, as well as the index was likely a contributing factor to the work's wide reading—Baillie was one of a number of practitioners who liberally referenced the work for instance, but it also attracted the ire of Cullen, as we will see in 1.3. Furthermore, the combination of different organisational systems within one work, both anatomical and nosological, demonstrated different methods by which anatomico-symptomatic correlation could take place. In this section we have focused on post-mortem examination and the attendant 'working back' to symptoms. But such correlation could also move from symptom to lesion. Lieutaud's functional work encouraged both projects.

All three books examined in this section were concerned with case histories. Cases were relevant to a number of different parts of the physician's practice and so were widely written and read. In this section I have focused on books that collated cases concerned with the findings made at post-mortem. This concern indicates that a wide range of practitioners dissected diseased cadavers in order to improve medical knowledge from the seventeenth century onwards. But the knowledge-making practice related to this act was fundamentally textual. Bonet, Morgagni, and Lieutaud all primarily engaged with the body in text in order to better engage with the literature.

1.2: Chemical Approaches to Disease—Boerhaave and Pringle

Other practitioners engaged with the body's *fluids* in order to explain the body in health and disease. In this section, I examine two prominent medical chemists who practised in the eighteenth century: Herman Boerhaave and Sir John Pringle. Both men prioritised a chemical understanding of the body in health and disease, ahead of concerns with the constituent parts

[128] Foucault 1963 (1989 translation), 155; Cunningham 2010, 196.
[129] Lieutaud 1779, 3 translation mine.

of the body. That is, the composition of fluids and their mixing in the body was the primary focus of their work; anatomy providing an important though secondary physical grounding to the reactions. But the two men approached such work in different ways. Boerhaave's work was a paradigmatic example of what Cunningham calls library pathology. Just like his physiology, his pathology was primarily theoretical. His work synthesised the traditional medical canon with new observations through text, creating a uniquely constituted pathology. Simultaneously this stemmed from his own conception of 'chemical physiology' and yet was traditional, as it focused on diet as cure.[130] Boerhaave's repeatedly expressed desire to obtain accurate observations was an important but ultimately secondary aspect of his method, which prioritised academic theorising over all else. By contrast, Pringle was more empirical in his methods. As Erich Weidenhammer has shown, Pringle's work was heavily influenced by Boerhaave, and incorporated the same kind of academic theorising as his teacher. However, Pringle prioritised different theories, being open to the older iatrochemical ideas that Boerhaave specifically wrote against, and explaining the causation of certain types of epidemic disease in a neo-Hippocractic manner. At the same time, Pringle undertook post-mortem examination, made observations in the field, and emphasised a Baconian-style empiricism, rising to the Presidency of the Royal Society as a result.[131] Chemical approaches to the study of disease in the eighteenth century therefore varied in method, just as anatomical approaches were on a spectrum between library medicine and experiment. Furthermore, these chemical approaches existed alongside and at times competed with other approaches to the study of disease, further highlighting the heterogeneity of the period.

Boerhaave casts a large shadow over all learned medicine in the eighteenth century. In the study of disease, he has been credited by historians as promoting "mechanistic disease explanation", and with being a major influence in making pathological anatomy a key part of the study of anatomy.[132] On such a gloss we might see Boerhaave as an early pioneer of the anatomical study of disease, but this would seriously distort what Boerhaave did in practice, what the aims of his work were, and how those aims were manifested in his works. Boerhaave's influence on the study of disease in this period was wide-ranging, multifaceted, complex, and, as we will see, somewhat diffuse.

[130] Knoeff 2006, 201-219.
[131] He later resigned this post due to political reasons. Weidenhammer 2016, 21-46; Weidenhammer 2014. My thanks to Erich Weidenhammer for sharing his PhD thesis with me.
[132] Porter 1997, 248; Cunningham 2010, 198.

Boerhaave's major project was the *academic* integration of the inherited medical canon with new empirical findings on the body—the circulation of the blood, various anatomical discoveries, developments in symptomatology and so on. Vital to this programme was the establishment of sound observations, or: "some Principles whose Certainty and Effects are *demonstrable* to our Senses […]; with *mechanical* and physical Experiments".[133] However, these observations did not have to be made or personally observed by Boerhaave in order for him to incorporate them into his work; many originated from the available literature.[134] After establishing "a relatively small number of primary concepts" grounded in observation, Boerhaave then, as Lester S. King put it, "elaborated" in order to explain physiological phenomena, with disease being abnormal function explained through various physiological elements.[135] This will be discussed in more detail below. First it is necessary to examine in greater detail the physiology he advocated, just as Boerhaave did in his lectures.[136] King's alchemical resonance in his description of how Boerhaave reached his physiological explanations is especially pertinent, as "academic chemistry" was combined in Boerhaave's work with observation and the medical canon to create a comprehensive system of medicine.[137] Boerhaave's system had five elements, or institutes: Physiology, Pathology, Semiotics, Hygiene, and Therapeutica, of which physiology was the most important.[138]

Rina Knoeff has summarised Boerhaave's physiology as "a chemical point of view" in relation to the workings of the body. This was explicitly different from mechanistic explanations of the body's functions. Boerhaave also emphasised that his view was different from other alternatives like Ruysch's traditional mechanism, Malpighi's "mechanical chemistry", and Borelli's "hydraulic" account.[139] For Boerhaave the body was made up of solids and fluids, with the fluid parts located in vessels through which they were kept in a constant determinate motion or circulation, which encouraged their separation and mixing in different parts of the body. The actions of the solids and fluids followed the "*Laws* […] of *Hydrostatics, Hygraulics,* and *Mechanics*; by which they ought therefore to be explained". Yet the "*particular Nature* or Texture of each Fluid" was also of vital importance for these

[133] Boerhaave 1751, 63 author's emphasis.
[134] For example, Boerhaave followed many of Malpighi's anatomical observations on the glands. Knoeff 2006, 206-207.
[135] King 1958, 65-66.
[136] See Boerhaave 1751.
[137] Knoeff 2006, 217.
[138] Boerhaave 1751, 77-78.
[139] Knoeff 2006, 201, 204-205. What was meant by 'mechanical philosophy' was (and is) ambiguous. See: Guerrini 1997, 111; Knoeff 2006, 202.

actions.[140] Thus Boerhaave's position took on aspects of rivals' positions in order to arrive at his own. His position emphasised that physiological systems worked in a regular way, explicable through mechanical and hydraulic principles, but also that attention to the specific nature of the solids and fluids—which separated and mixed in myriad ways—was vital to the understanding of those very processes. As Knoeff puts it, Boerhaave's "chemistry is not about mechanical processes of fermentation, but about the *chemical* nature of reactions between particles in motion".[141] It was therefore a broad physiology in comparison to other accounts like the mechanical one in that it encouraged the understanding of the constituent parts of the body (the solids and fluids) and the motions of the body in themselves, but furthermore, and crucially, it encouraged investigation into the work that these aspects did *together* in the functioning of the body—the *particles* were *in motion.* In Boerhaave's words: "I have learnt from experience, that different parts, of different properties, are mix'd in with all such bodies; whilst these parts have respectively their own peculiar powers". When investigating physiology "We must not, therefore, attribute more to mechanical power, than the author of nature has given to natural bodies; nor extend this power beyond its proper bounds, in accounting for chemical operations".[142]

Boerhaave aimed at providing a comprehensive account of the human body and its functions. All of the body's phenomena were to be explained through reference to his physiological framework. This aim for comprehensiveness entailed for Boerhaave an engagement with empirical study that simultaneously made use of its findings and was critical of resting conclusions about the body on them alone.[143] He was clear that "There are two Methods which may be relied upon as certain for the Attainment of our Profession, which may be esteemed its solid Foundations". That was an "accurate *Observation* of all the Appearances offered to our Senses in the human Body" and "a strict Consideration and Discovery of the several latent Causes, concealed from our naked *Sense* in human Bodies, by a just *Reasoning*". However, reasoning took primacy: "Physic thus established upon Judgement and Observation, can be only attained by a just Reasoning from the several Facts, which have before been

[140] Boerhaave 1751, 80, 85 author's emphasis.
[141] Knoeff 2006, 205 author's emphasis. J.R.R. Christie has also noted that an early version of Boerhaave's history of chemistry he "effectively emphasized a profoundly chemical formulation for modern medicine, making much of medicine a necessarily chemical subject, and implying that much relatively recent progressive innovation had a chemico-experimental source." Christie 1994, 11.
[142] Boerhaave 1741, 511.
[143] Knoeff demonstrates that in his debate with Ruysch on the glands, Boerhaave both used and criticised Ruysch's observations in order to maintain the existence of a structure he had postulated which prioritised chemical investigation. Knoeff 2006, 208-216.

thoroughly considered in every respect".[144] Such an approach to medicine was academic. As Knoeff argues:

> That is not to say that it was mainly rational and theoretical (this was a feature of scholastic natural philosophy that Boerhaave despised), but it means that it was developed and practised in the university's laboratory and lecture theatre and, therefore, was closely linked to pedagogy and research.[145]

Therefore, despite empirical data of all kinds being of great interest and import for this approach, it remained primarily academic. In practice Boerhaave contrasted theoretical learning with learning solely from experiments, and prioritised the former in teaching. "He that would learn by Experiments, ought to proceed from Particulars to Generals; but the Method of instructing *academically*, proceeds from Generals to Particulars; *which is the Method we shall observe*".[146] This necessitated that the student would indeed learn "such Things as are demonstrated to be true in *Anatomy, Chemistry* and *Mechanics,* with natural and experimental *Philosophy*" but crucially, "provided he continues his Reasoning".[147] In such a way the student could "begin first with such as are most simple, certain and easy to be understood", before building "to the most complex, obscure and difficult" matters of the body.[148]

This approach extended to his treatment of the study of disease. Boerhaave emphasised that where physiology, the first branch of physic, was the study of "Things natural or according to Nature", "The second Branch of Physic is called Pathology" and treats of "Things preter-natural, or contrary to Nature".[149] Physiology, in being concerned with regular function, therefore grounded the understanding of disease, which was abnormal function. Based on his physiology, he divided disease into diseases of the solids and fluids.[150] And in the pursuit of comprehensiveness, Boerhaave outlined what abnormal functions were caused by, and what therapeutics ought to be used to cure them. For example, as Porter summarises: "Tuberculosis was an example of the weakness of the solid parts, blood clots an example of overly rigid fibres. Give milk and iron for weak fibres, let blood for rigid ones, he counselled".[151] This was much of the appeal of Boerhaave's synthesis—it gave the physician a complete picture of what was wrong and how to cure it, added to a comprehensive

[144] Boerhaave 1751, 57 author's emphasis.
[145] Knoeff 2006, 217.
[146] Boerhaave 1751, 76 emphasis mine.
[147] Ibid., 74 author's emphasis.
[148] Ibid., 76.
[149] Ibid., 77-78.
[150] Ibid., 96.
[151] Porter 1997, 246.

symptomatology. Yet this completeness and success—Cullen would relate that he was criticised at the commencement of his lecturing career for straying from Boerhaave's teachings—belied a crucial weakness in his system that was significant for the pursuit in the study of disease in the eighteenth century.[152] It was simply, I argue: vagueness.

Consider the glands. Boerhaave advocated studying the specific fluids that are secreted from each gland. Those fluids had huge variety.[153] Many of these various fluids circulate too and, when abnormal function is added into the picture, might circulate abnormally. So, identifying abnormal humours was difficult. If identified, the mixing of those fluids was complex: "He maintained [Knoeff explains] that as soon as fluids from the arteries and nerves are poured into the glands, they swell up, mix, change and perfect the fluids until the glands are ready to pour out new and different fluids via the exit pipe".[154] In each gland of the body—which would differ depending on location and function—fluids—which would differ depending on their chemistry and function—would mix in order to change into a 'perfected' fluid that would perform the gland's intended function. There was much room for heterogeneity in this picture, to say nothing of whether the quantity or order in which the fluids mixed had any effect on normal or abnormal function. Explaining what had happened or gone wrong in the mixing of chemicals in the glands was therefore open to question, even after Boerhaave had given his preferred explanation.

Anatomy was also a cause of problems. In the case of the glands, the anatomical structure was initially established by Boerhaave in order to demonstrate that it was not important for understanding the function of the gland, in opposition to Ruysch. But Boerhaave later changed his position on their structure to something closer to Ruysch's view.[155] That he did so demonstrates admirable commitment to his academic principles, but it also emphasises that at its base his physiology was overtly theoretical and thus always open to questioning. This in itself was not the source of vagueness, rather the combination of uncertainty over both chemical and anatomical observations led to an ambiguity in what was to be prioritised in physiological explanation, and therefore in pathological explanation. If the structures that Boerhaave posited were open to question, then so was the role the structure played. And if the nature of the fluids and their mixing was open to question, then so was the role of the fluids.

[152] King 1958, 60.
[153] Boerhaave advocated following Morgagni's distinctions of the humours, which were so vast as to include anatomically located sweat. Knoeff 2006, 216.
[154] Knoeff 2006, 216.
[155] Ibid., 206.

Boerhaave himself became more chemically minded over the course of his career.[156] Other practitioners might, and did, prioritise one or the other in their own explanations.

Pringle was one such practitioner. He published his most famous work, *Observations on the Diseases of the Army*, in 1752 and has since been credited as one of the fathers of military medicine, the originator of the idea of the neutrality of military hospitals, and coiner of the term 'antisepsis'.[157] Pringle's work, alongside its practical measures and concern for 'the men', was especially concerned with putrefaction as a cause of disease, specifically bilious diseases, with the idea of antisepsis being a "corresponding medicinal virtue to counteract it".[158] In his work, Pringle was heavily influenced by Boerhaave but undertook a different practice for different purposes. In terms of the study of disease, Pringle's work engaged primarily with the body's fluids at the same time that it emphasised the importance of the body's geographical location in understanding certain types of epidemic disease in a neo-Hippocratic manner. Pringle undertook post-mortem examinations and was concerned with the effect of local conditions as the originator and facilitator of disease, but his investigations into the nature of disease were primarily chemical whilst his methods incorporated both academic theorising and empirical experimentation.

The structure of Pringle's book is instructive as to his approach to the study of disease. He split the work into three main sections. The first part (i) contained his observations taken on campaign, consisting of: "all the circumstances of the army, that I believed might either affect the health, or afford materials to others, to reason differently upon". This allowed Pringle to highlight events in the war that might have caused disease.[159] He saw the observations in the first section as a resource that might be revisited for different motives in the future. Given that purpose (ii): "I have, therefore, thrown most of the reasoning resulting from the first part, into the second; in which, after dividing and classing the diseases common to a military life, I enquire into the more remote or general causes of them; namely, such as depend upon the air, diet, and other circumstances". Here he "ventured to assign some sources of diseases very different from the sentiments of most writers upon this subject; and I have also shewn how little instrumental some other causes are in producing sickness".[160] Furthermore, "After explaining the general causes of the sickness, I proceed to point out the means of removing

[156] Ibid., 212.
[157] Weidenhammer 2014.
[158] Weidenhammer 2014, 104; Weidenhammer 2016, 29-35.
[159] Pringle 1752, vi.
[160] Ibid., vii.

some, and rendering others less dangerous. Without this addition, the former considerations could have been of little use".[161] Finally, the third part (iii) was intended specifically for medical practitioners, and was on "the practice". He was specifically concerned with "bilious and malignant fevers, and the dysentery, as they are diseases less frequent in this country" but occur on campaign in the Low Countries.[162] The focus was on furnishing the medical practitioner with means of diagnosing and treating such diseases.

Like Boerhaave, Pringle thus valued both observation and reasoning. And like Boerhaave, Pringle prioritised theorising in order to explore 'the general causes' of disease, with observation best suited to focusing on specific circumstances. So, Pringle's *observations* went from particular circumstance to general assertion, whilst his *theorising* began with general points before discussing particular instantiations of it, in the Boerhaavian manner. For example, after the Battle of Dettingen the soldiers "lay on the field of battle, without tents, exposed to a heavy rain", a situation not improved by marching to Hanau and camping on "an open field and on good ground, but then wet". Pringle concluded: "By these accidents, a sudden change was made in the health of the army".[163] The specific circumstances after the battle afforded Pringle the opportunity to emphasise the point that the health of the army was reliant on, *inter alia*, reducing exposure to damp conditions. Later in the work, Pringle's theorising of "a broadly putrid cause to which bodies were susceptible when subject to institutional confinement in certain environments" became the framework for explaining specific observable symptoms of putrefaction:

> I conceive that the miasma or septic ferment (consisting of the effluvia from putrid substances) received into the blood, has a power of corrupting the whole mass. Its resolution and sometimes even its smell in the advanced state of a malignant fever, the offensiveness of the sweats and other excretions, the livid spots, blotches, and mortifications incident to this distemper, are proofs of what is here advanced.[164]

Another instantiation (apart from malignant fever) was scurvy—the result of a similar but slower putrefaction process.[165]

Pringle's methods of reasoning were therefore largely in keeping with Boerhaave's teaching. However, in *Diseases of the Army* he was explicit in criticising Boerhaave for resting

[161] Ibid., ix.
[162] Ibid., x-xi.
[163] Pringle, 1752, 23-24. See also: Weidenhammer 2014, 87-88.
[164] Pringle 1752, 354-355; Weidenhammer 2014, 36.
[165] Weidenhammer 2014, 36.

his explanation of such diseases on acids and alkalis in lieu of formal putrefaction. For Pringle, this was too mechanistic:

> [mechanists] either wholly rejecting, or too sparingly admitting chemistry [in their explanation of fevers]. This error did not escape the learned Boerhaave, who, tho' he retained the use of mechanics, yet revived and reformed the doctrine of *acids* and *alcalies*; and under these last comprehended all that he thought *septic* or *putrid*. But, as my celebrated Master had not time to ascertain every part of his doctrine from experiments of his own, it was no wonder some mistakes were made, and that the extent of these principles were not fully understood.[166]

Instead, Pringle's work attempted to, as Weidenhammer puts it, "re-establish the chemical process of putrefaction as a vital concept by subjecting it to rigorous investigation".[167] This was effectively a partial return to iatrochemical notions of putrefaction that had preceded Boerhaave's work, but through employing an explicitly Baconian approach to experiment. Weidenhammer has convincingly argued that Bacon's own interest in putrefaction acted as a 'sanction' for Pringle's own work, with this work being "the continuation of Bacon's utilitarian project as refracted by the Royal Society—that is, stripped of Bacon's intricate methodology, but retaining the objective of establishing 'matters of fact' about nature in order to advance learning and assist the state".[168] But this investigation, in focusing on chemistry, also chimed with Boerhaave's own empirical work. Pringle thus produced three chemical papers read at the Royal Society in 1750 on 'Some experiments on substances resisting putrefaction'.[169] But furthermore, Pringle also undertook post-mortem examinations of those who had died of disease in the manner undertaken by Bonet. In the final part of *Diseases of the Army*—which was specifically for fellow physicians—there are sections 'Of the Dissections' for both dysentery and malignant fever. These descriptions read much like Bonet's case histories. They give a brief account of individual cases that Pringle examined, noting specific circumstances and observations. All of the aspects of Pringle's investigations embodied Boerhaave's academic methods, but undermined his teachings on the nature of putrefaction primarily through greater emphasis on empirical observation.

This was motivated by an important theoretical difference between Pringle and Boerhaave on the promise of chemistry. Whilst Boerhaave was certainly an advocate of chemistry, he was also writing at a time where mechanical explanations of the body were seen

[166] Pringle 1752, xiii-xiv author's emphasis.
[167] Weidenhammer 2014, 124.
[168] Ibid., 96-97.
[169] Pringle 1750a, 480-488; Pringle 1750b, 525-534; Pringle 1750c, 550-558.

as particularly promising, with iatrochemical notions seeming old-fashioned. Meanwhile Pringle, the junior man, wrote at a time when the promise of mechanical explanations of the body in providing, in Weidenhammer's terms, a "renovation of medicine had failed to materialize", just as Boerhaave had done earlier in respect to iatrochemistry, "as a recognisable movement whose heyday had passed". Pringle was therefore more open to older ideas of putrefaction at the same time as being aggressive towards mechanical physiologies. In the terms of their respective approaches to putrefaction, Pringle emphasised the "nature and degree" of the chemical process of putrefaction as central to distinguishing it from other putrid illnesses where Boerhaave "subsumed" the same process "within a framework based on physical blockages to circulation". Furthermore, Pringle disagreed with Boerhaave's assertion that substances became alkaline as they putrefied.[170] Using Boerhaave's approach, Pringle emphasised an understanding of putrefaction that was theoretically different from Boerhaave's own. The theoretical approach that Boerhaave advocated therefore encouraged his students to move away from his own physiological theories, and therefore his understanding of disease, because many of his arguments and principles were not settled by his reasoning and could therefore always be subject to more analysis or empirical work.

Pringle's arguments regarding putrefaction not only undermined Boerhaave's position; his work was highly regarded in Britain to the extent that it became a promising avenue for the study of disease in itself. As Weidenhammer argues: "For a decade, from 1765 to about 1775, it seemed possible that the body's balance between health and disease might depend on an internal antiseptic economy".[171] Chemical investigation into disease was therefore prioritised in certain circles in the late eighteenth century, most notably in the work of David Macbride.[172]

Boerhaave cast a long shadow over the chemical investigation of disease, even as his pupils worked to undermine his overall system. Later authors such as Pringle began to prioritise observation more and more in medical chemistry, but the theoretical consideration of findings remained an important aspect of the chemical approach to disease throughout the eighteenth century. Chemical approaches could therefore be empirical but were ultimately grounded in theory.

[170] Weidenhammer 2014, 131-132.
[171] Ibid., 104.
[172] Weidenhammer links Pringle's work to later investigations into the air undertaken by David Macbride, which were part of wider efforts at investigating the air. Ibid., 133-142.

1.3: Nosology and the Symptomatic Study of Disease—Sauvages and Cullen

The eighteenth century saw, as Cunningham has put it, a "passion" for making nosologies. These were systems of disease classification based on "some medical principle or other". Cunningham has emphasised the importance of anatomical principles for many of these systems.[173] But other principles were available, including the classification of disease by symptoms. Two of the most prominent nosologists were Sauvages and Cullen, who produced symptom-based nosologies, and so are the focus of this section. Sauvages produced a complex nosology that defined disease symptomatically. This was aimed at being a vital block in a comprehensive understanding of disease. The definition of diseases ultimately served the purpose of improving medicine. Sauvages's rigorous definitions of disease could then be used to serve therapeutics. Thus, nosologies were not simply definitional, but reflected the wider concerns of their makers. In this regard, Cullen is a particularly pertinent example. Cullen's nosology was aimed at providing a simpler classification of diseases to his students. He also defined diseases symptomatically, but in his teaching placed a greater emphasis on understanding the *causes* of disease than Sauvages. For Cullen, disease was not curable in itself, with his emphasis being on prevention. Hence, understanding the causes of disease, especially the proximate cause, was of vital importance. Most significantly, Cullen argued that disease was caused by the manner in which one lived, with his therapeutics primarily being based on understanding the remote causes of disease (even though they may not necessarily be the cause in individual cases). As a result, Cullen was ambivalent about the role of dissection in understanding disease. His extraordinary attack on Lieutaud, which I discuss at the end of this section, demonstrates that for Cullen, anatomy in itself was insufficient, and that the systematising of anatomical observations to serve the understanding of causes was the only valid manner of pursuing the subject. Taken together, the works of Sauvages and Cullen thus characterise a pursuit of knowledge about disease through focusing on symptoms. That knowledge was at base observational, but defined through intellectual endeavour, and guaranteed by theoretically-grounded systems.

Sauvages is most famous for his book *Nosologia methodical* (1763). Julian Martin has argued that for Sauvages, the term 'nosologia' simply meant "knowledge of diseases", and that his work was quite different to later nosologies, which focused only on classifying diseases.[174]

[173] Cunningham 2010, 198-199.
[174] Martin 1990, 134-135.

The work was a complex attempt at arranging diseases that were defined symptomatically within a classification system modelled on those of botanists. In producing the work, Sauvages was primarily motivated by Giorgio Baglivi's call for a 'historical' definition of diseases, by which he meant definitions of diseases that captured their nature without the intervention of the practitioner's opinion, obtained through a modified Baconian method.[175] Sauvages thus aimed to produce a nosology comprising of "Historical" and "Philosophical" knowledge of diseases which in combination would provide a "philosophical knowledge" of disease. This was radically different from the pathology of Boerhaave, as rather than viewing disease as disturbances of function, he viewed them as distinct entities comprising specific constellations of symptoms.[176] The first part of his work on what Sauvages termed his "symptomatic method" comprised an account of symptoms that were constantly associated with a particular disease classified carefully according to a botanical-style system.[177] As Martin has shown, the "species of disease" was the fundamental unit that identified specific diseases. The concept, derived from Baglivi, was applied by Sauvages to the visible signs or symptoms that were seen to define individual diseases. From these "species", ideas of "classes" of disease were built up through the Baglivian modification of the Baconian method. Classes were then subdivided into "sectiones" and "genera", resulting in the work's organisation of: Classes-Sectiones-Genera-Species. This classification system was based on Joseph Tournefort's botanical classification system, now applied to disease.[178] Sauvages's system was thus grounded on concepts and organisational ideas that stemmed from seventeenth-century medicine and botany.

Though Sauvages was engaged in a new project, it is notable that his methods were primarily theoretical and classificatory, and therefore text-based. Though not library pathology in the manner of Boerhaave, Sauvages's work was nevertheless located in the library. His theoretically sophisticated system required as its key input observations. These were best made and written down oneself, of course, but Sauvages also, in Martin's terms, "consulted medical books and extracted symptoms from the case-histories they contained".[179] Sauvages's work was to survey written texts in an effort at understanding the essence of species of disease. For Sauvages this work provided insight into the cause of diseases, and he developed it separately within a Newtonian framework.[180] Alongside this he synthesised observations drawn from

[175] Martin 1990, 115-118.
[176] French 1990, 103-109.
[177] Martin 1990, 135; Sauvages 1768, 19.
[178] Martin 1990, 118-126.
[179] Ibid., 123.
[180] Ibid., 126, 128-134.

other areas of medical inquiry, such as anatomy and chemistry, worked towards the second part of his nosology, the 'Philosophical', which would provide comprehensive and rigorous explanations of diseases.[181] Naturally, such explanations would soon benefit therapeutics. The symptomatic definition of disease was thus only a starting point for Sauvages's enterprise, which was ultimately aimed at a comprehensive account of diseases motivated by the overall improvement of the practice of physic.

Such a characterisation of Sauvages's nosology also fits that of Cullen. In Porter's estimation Cullen was "In the English-speaking world, the most influential attempt to set disease in a coherent framework".[182] When professor at the Edinburgh Medical School he held the chairs of chemistry (1755–1766), theory of medicine (1766–1773), and practice of medicine (1773–1789) consecutively. His teaching was wide-ranging and had a systematising bent. Most notably, Cullen produced his own nosological system by which diseases could be defined through symptoms in relation to their probable cause in a manner that was far simpler than Sauvages's.[183] Cullen was therefore, like Boerhaave, concerned with systematisation, with the practice of the physician, and with chemistry as it applied to medicine. Unlike Boerhaave, Cullen advocated a neural understanding of physiology, focused his teaching on pathology which subsumed physiology, and placed a different emphasis on chemistry in the understanding of disease. Indeed, Cullen was "anti-Boerhaavian" in an aggressive sense in both his chemical and medical work. As he stated in his *First Lines of Physic*: "I believe there are very few pages of his [Boerhaave's] aphorisms in which there does not occur some error or defect".[184] The wide-ranging nature of Cullen's work requires that I focus on his teaching of pathology at the expense of a more rounded picture of Cullen, for whom the practice of physic was the primary concern. In this regard, much of my analysis here rests on Rosalie Stott's paper 'Health and Virtue: Or, How to Keep Out of Harm's Way. Lectures on Pathology and Therapeutics by William Cullen c. 1770', which provides the most complete account of Cullen's views on pathology and the study of disease by examining manuscript material for his mature lectures on the theory of medicine. In Stott's view this is an especially enlightening approach for historians in regard to Cullen as:

> all his work was intended as a means towards their [the students'] improvement, and as subordinate to that end. It was through these channels that Cullen's real creativity

[181] Martin 1990, 135-136; Sauvages 1768, 7.
[182] Porter 1997, 260.
[183] Ibid., 261-262.
[184] Cullen 1784, xxxiii. On his 'anti-Boerhavian' chemistry see: Christie 1994, 5. On his medicine see: Stott 1987, 123-142.

> flowed, and through which we discover the positive purposes behind what was often an extremely diffident manner.[185]

Stott has argued that Cullen's physiology was "hardly distinguishable" from his pathology "in that all the processes and forces acting upon the human body in one set of circumstances maintained health, whilst in another set of circumstances they could produce disease".[186] Such degrees of difference between one state and another—in this case health and disease—pervaded Cullen's work, which stressed balance and rationality. This is emphasised by the key role that his 'Doctrine of Causes' played in his pathology. The Doctrine was "designed to demonstrate that every diseased state was the fruit of a series of changes, or causes, which it should be possible for physicians to trace". In this account causation was the "*only* coherence Cullen could impose on phenomena", which stemmed from Humean epistemology.[187] Disease was therefore either an excess or deficiency in the individual. Individuals had different physiological balances, and whatever the manifestation of the disease it stemmed from either a specific proximate or specific remote cause. Identifying the causes of disease was therefore, for Cullen, vital for the practice of physician. In Cullen's view the role of the physician was not to cure disease *per se*—such a thing was not possible as the very concept of curing disease was incompatible with his view of pathology. Instead he emphasised prevention, which was another way in which physiology and pathology merged in Cullen's work:

> The common language is that 'Medicine is the art of preserving health and of curing diseases', but I have said 'the art of preventing diseases'; for although I do not deny that the preserving of health is the object of a physician's care, yet I maintain that there is truly no other means of preserving health but what consists in preventing disease.[188]

Establishing the cause of disease was therefore central to his pathology, not only in understanding the disease, but also to preventing it. The proximate cause was the most significant: "The Cure of diseases [their prevention] is chiefly, and almost unavoidably, founded in the knowledge of their proximate causes". To gain such knowledge one had to have: "knowledge of the structure, action, and functions of the human body; of the several changes which it may undergo; and of the several powers by which it can be changed".[189] This corresponded to Cullen's Institutes of Medicine which had three disciplines as opposed to the

[185] Stott 1987, 125.
[186] Ibid., 128.
[187] Ibid., 127 author's emphasis.
[188] Cullen 1770 quoted in Stott 1987, 128.
[189] Cullen 1784, 5.

traditional, Boerhaavian, five (see above): Physiology (incorporating anatomy), Pathology (incorporating semiotics), and Therapeutics (incorporating Hygiene).[190] As we have seen his physiology was almost interchangeable to his pathology, and correspondingly Cullen's therapeutics were also tied closely to his view regarding the prevention of diseases through his incorporation of hygiene into it. As well as proximate causes, he emphasised that remote causes—social and environmental factors—were significant in their own right: his therapeutic lectures were primarily a study of remote causes. Cullen thought that remote causes could cause disease, despite widespread opposition to this idea because remote causes were not *necessarily* the cause of disease.[191] Both internal and external causes of disease were therefore of concern for Cullen, the latter more significant than the former in certain circumstances.[192]

The incorporation and centrality of proximate causes in Cullen's pathology emphasises the importance of the effects of human behaviour in the cause and course of disease. This integration was, Stott argues, due to Cullen promoting virtuous living as the key to health, which was significantly different from the more common, Boerhaavian, idea that disease was simply abnormal function. For Cullen, disease was caused by unvirtuous living. By emphasising that the preservation of health was the only way of preventing disease, Cullen promoted the idea that health was the antithesis of disease.[193] In a letter to one of his patrons, he discussed what this meant for individuals: "those, who, relieved from servile labour or very assiduous employments have leisure to bestow on the study and are capable of learning the principles of it [health] and applying these to particular cases and occasions".[194] This was, however, impossible for certain sections of society, such as the poor

> exposed to the hazards of disease for the good of their whole. Happily their manner of life and even their hardships are the best means of preserving their health. It is true that this is not universal and many men are doomed to employments more or less directly pernicious to health, but it is necessary for the good of the whole society, and the only compensation the society can make to them is the taking the greatest care of them, in disease and old age.[195]

[190] Stott 1987, 127.
[191] Ibid., 127-128.
[192] Stott gives the example of an unpublished work on hypochondria to show how Cullen's clinical reasoning incorporated consideration of remote causes in his therapeutic advice. Ibid., 141-142.
[193] Ibid., 140.
[194] Cullen undated, quoted in Stott 1987, 141.
[195] Ibid., 140.

What was implicit in his lectures to students was here explicit. Cullen promoted virtuous behaviour as key to health. This was not possible in such fundamental terms for the idea that disease was abnormal function.

The importance of Cullen's conception of disease for our purposes is that it did not emphasise, and indeed it was ambivalent about, the role of anatomy and post-mortems of diseased cadavers in discovering the causes of disease. Instead, Cullen's conception of disease lent itself to chemical investigation. If health was the result of living virtuously—neither in deficiency nor in excess—and disease was the result of living unvirtuously, then it did not follow that anatomy would tell the physician what the actual cause of disease was, though it might. On the other hand, the interplay between the types of food ingested (for example) and the constitution of the patient was necessarily chemical.

Thus, Cullen's statement that: "the dissection of morbid bodies, is chiefly valuable upon account of its leading us to discover the proximate causes of diseases" must be seen as a qualified endorsement of the practice rather than a promotion of it.[196] Anatomy was important for the physician to discover the proximate cause where possible, but anatomical findings were not necessarily the cause of disease and therefore would not necessarily lead the physician to the appropriate treatment. The passage in which the above statement derives is an extraordinary attack on the work of Lieutaud. In the introduction to his 1784 work *First Lines of the Practice of Physic*, Cullen spent thirteen pages—in a forty-eight-page preface—attacking Lieutaud. This attack goes some way to clarifying Cullen's own position on dissection.

According to Cullen, Lieutaud had been "commendably employed" in "the Dissection of morbid bodies", but "in my humble opinion, he has seldom done it in a manner that can be useful".[197] The underlying issue was that the findings were not systematised:

> he has delivered the symptoms of diseases without any instructive arrangement; so, on the subject of the appearances after death, he has mentioned every morbid appearance that had ever been observed after the disease of which he is then treating: but these appearances are strangely huddled together, without any notice taken of those which belong to one set of symptoms or to another; and, with regard to the whole, without any attempt to distinguish between the causes of diseases and the causes of death; although the want of such distinction is the well-known ground of fallacy upon this subject.[198]

[196] Cullen 1784, xl.
[197] Ibid., xxxviii.
[198] Ibid., xxxix.

Good practice in systematising from morbid findings would allow the physician to understand what the proximate cause of disease was. An example of good practice in systematising from morbid findings was, for Cullen, Morgagni: "I cannot dismiss this subject without remarking, that the dissection of morbid bodies, is chiefly valuable upon account of its leading us to discover the proximate causes of diseases; and the great and valuable work of the illustrious Morgagni".[199] By comparison Lieutaud's work was not valuable as it did not provide any such reasoning back to causes. Post-mortem observations like Lieutaud's that did not attempt to systematise in the manner of Morgagni were not valuable for Cullen as they did not necessarily relate to the real cause of disease. To put it another way: in each of Lieutaud's cases there was no way of knowing if the actual cause of disease was not, in fact, a remote cause—a social or environmental cause that did not relate to anatomy at all. Cullen's ambivalence towards anatomy therefore stemmed from his conception of health and disease.[200] For Cullen, the systemisation of information gained at post-mortem was therefore a *first step* in usefully using such information, and this necessarily required some theoretical framework in order for it to be intelligible. Morgagni was an exemplar in this regard. But as we have seen, Morgagni's work was virtually irreproducible. Furthermore, Cullen's advocacy of Morgagni was not followed up practically in his teaching, so remained largely rhetorical.

1.4: The Anatomical Study of Disease—Hunter and Baillie

Throughout this survey of eighteenth-century approaches to the study of disease, we have seen that the post-mortem examination of diseased cadavers was a widespread and important practice in the writing of case histories. Dissection was, of course, a central feature of anatomical investigation, but it did not necessarily generate anatomical knowledge. In the eighteenth century, anatomy was experimental, and used a number of relatively new techniques to explore the body in new ways. These were typically related to attempts at preserving the body. Therefore, anatomical approaches to the study of disease must be located in the extension of such practices to diseased cadavers. In this section, I argue that at the Great Windmill Street school, William Hunter initiated an experimental approach to the diseased cadaver, treating it in certain important respects as the regular body. Crucially, the diseased cadaver was preserved and collected in the manner of regular anatomy, which encouraged the use of techniques like the injection of vessels on the diseased body. As I show in Chapter 2, this approach was taken

[199] Ibid., xl.
[200] Other historians have noted Cullen's ambivalence towards anatomy, for example: Bertoloni Meli 2017, 118.

up and extended by Baillie, who learnt these preservative and experimental techniques from Hunter as well as inheriting his collection. The practice of anatomy at the Great Windmill Street school was distinct from the post-mortem examination undertaken for the production of case histories. It was done for a different purpose, and created different outputs, most notably anatomical preparations housed on museum shelves and explained in catalogues, as opposed to written narrative accounts. This difference was crucial for Baillie's conception and execution of *Morbid Anatomy*, which I discuss fully in Chapter 3. Here I focus on the overall influence of collecting to the pedagogical arrangements at Hunter's school, and the conceptual relationship that Hunter advocated between anatomy and physiology. Hunter saw anatomy as the only suitable foundation for reasoning on physiology, so collected anatomical preparations widely. This extended to preparations of diseased parts. As lectures were based on preparations, Hunter created separate lectures on disease. This influenced Baillie in two ways. First, Baillie conceptualised morbid anatomy as a separate though related subject to regular anatomy. Second, Baillie extended Hunter's conception of anatomy as the basis for physiology to his own formulation of morbid anatomy, which was the basis for investigating morbid action.

Hunter's anatomy school at Great Windmill Street in London was not concerned with the study of disease specifically. Nevertheless, the school produced an influential approach to the study of disease that differed significantly from contemporaneous approaches. This approach arose from the central pillar on which Hunter's school rested: his collecting practices. Hunter's collecting of anatomical material served both his anatomical inquiry and his teaching purposes, creating a collection that comprehensively served his lectures at the same time as enabling speculative study in ways that Hunter might not have originally envisaged. Baillie's work was one such area.[201] Diseased body parts that had been made into preparations and added to his collection by Hunter for anatomical purposes—diseased livers and kidneys rounded off anatomical lectures on those subjects for example—were repurposed by Baillie for *Morbid Anatomy*. But it was not only the material of Hunter's school that helped to shape Baillie's work. Hunter's pedagogical system, which has been recently characterised by Carin Berkowitz as a 'system of display', saw objects—specifically the object of the body instantiated in different ways—as the material embodiment of knowledge at the same time as they were the literal object of study.[202] Thus pedagogical theory and pedagogical practice coalesced in

[201] This did not only apply to medicine. Hunter's coin collection, for example, was the basis for Charles Combe's work on coins which "revolutionised the recording of coins". Brock 1985, 45.
[202] Berkowitz 2013, 360; Berkowitz 2015b, 44-75.

Hunter's work, and Hunter's collecting of anatomical preparations was intimately linked to his course of lectures throughout his career.

The centrality of preparations to Hunter's teaching is underlined by a comparison of Hunter's early and late career lecture series with the *Catalogue of Anatomical Preparations* produced for the museum between 1770 and Hunter's death in 1783. Table 1 lists the first nine anatomical lectures in the notes of an early student at the school, Charles White, from 1752 (omitting the introductory lecture) alongside the first anatomical lectures listed in the course description in the *European Magazine* in 1782 (omitting the introductory lectures). The similarity that the opening lectures had in Hunter's late and early career is clear, but furthermore, the content of these lectures directly corresponds to the first few entries in the anatomical catalogue. Hunter incorporated the handling of anatomical preparations by students in his lectures to help them better understand and remember the lecture.[203] Table 1 demonstrates that Hunter's collection of anatomical preparations was organised around his lectures, and therefore lecturing purposes.[204]

[203] See Chapter 2.
[204] It is worth noting that this pattern did not hold for the whole collection, which was, of course, a working collection and therefore subject to other demands and requirements.

Table 1: Comparison of Hunter's first set of anatomical lectures in his early and late career with the list of preparations in his *Catalogue of Anatomical Preparations*. White 1752 (published 1972); *European Magazine* 1782, 166-167; *Catalogue of Anatomical Preparations* 1770-1784.

List of first set of anatomical lectures from Charles White's *Hunter's Lectures of Anatomy* (1752)	List of the second section of lectures from *European Magazine, or London Review* (1782)	List of first twelve entries in William Hunter's *Catalogue of Anatomical Preparations* (1770–1783)
2. Experiments upon Blood	Blood	A – Of the Blood
3. Of an Artery	Arteries	B – Arteries
4. Of a Vein	Veins	C – Veins
5. Of a Lymphatick	Lymphatics or absorbents	D – Absorbent System
6. Of a Gland	Glands	E – Nerves
8. Of the Nerves	Nerves	F – Cellular Membranes
9. Of a Muscle	Muscles	G – Glands
10. Of the Bones	Bones and their appendages	H – Muscles
		J – Bones
		K – Periarteum
		M – Ligament
		N – Osteogeny

Indeed, the central role that preparations played in Hunter's teaching influenced almost every aspect of how his school was organised, not only his collection. Helen McCormack has shown that Hunter's school was very carefully designed, and that the architect (Robert Mylne) and physician worked together closely in order to allow the building to facilitate the purposes of the school.[205] This included a specific room for making anatomical preparations, the 'Preparations Room', which presumably housed all of the necessary tools and ingredients for the purpose.[206] The Preparations Room was situated near the rooms used for dissecting and the 'Drying Room'. This was all at the rear of the building near where bodies would be delivered by the notorious 'Resurrection Men'. Graverobbing was a vital source of corpses for the school, the Hunters (likely John Hunter especially) being responsible for the expansion of the trade in

[205] McCormack 2007, 105-109; McCormack 2015, 20-21.
[206] McCormack 2007, 106.

London.[207] The practice had two main purposes for the Great Windmill Street school: to supply bodies for pedagogical purposes, and for research purposes. These purposes often overlapped at the school, as the communication of new discoveries and a reputation for producing them were attractions for students.[208] These purposes corresponded with the reasons for collecting anatomical preparations. This was not coincidental. The evidence of the body was central to Hunter's work. Cadavers were therefore extremely valuable resources for the work of the school, and much effort was gone to in order to extract as much value from them as possible through making as many preparations from cadavers as possible. This required organisation.

Once acquired, the school was both physically and conceptually organised towards retaining as much information from cadavers as possible through various artisanal practices, such as making illustrations or anatomical preparations (see Chapter 2). Furthermore, the practice of retaining information from cadavers was not only geared towards Hunter's specific interests like the gravid uterus but extended to virtually any interesting anatomical appearance or structure. Once an interesting appearance or structure was collected, it was used in teaching. This included diseased parts. In Hunter's early career, diseased parts were examined at the end of lectures on the related healthy part. For example, in Charles White's notes of Hunter's lectures taken in 1751, various diseases of the bones are discussed at the end of the lectures on the bones.[209] However, by the end of Hunter's career the collection had expanded in several directions; most notably its collection of preparations concerned with childbirth and the female parts of generation, as well as its collection of morbid anatomy preparations. As a result, Hunter increased the number of lectures on those topics. The 1782 advert in the *European Magazine* stated that:

> This course of lectures has now been given for 36 years, and till the last three years two courses were read every winter; one from the beginning of October to the middle of January; the other from the end of January to the middle of May. But though two hours were allowed for each lecture, in a course of years *the matter was found to be so much increased, that it was necessary to alter the plan*, and to spend the same quantity of time upon one full and comprehensive course through the whole winter.'[210]

The course expanded in those areas where the most collecting of preparations had occurred. In 1752 obstetrics and related fields took up a relatively minor part of the course. White's notebook lists three entries on the subject: Of the Gravid Uterus, Of the Peculiarities

[207] See: Moore 2005, 71-100; Cunningham 2010, 135; Gelfand 1972, 99-130.
[208] Porter 1985, 25.
[209] White 1752 (published 1972), 31-46.
[210] *European Magazine* 1782, 166 emphasis mine.

of the Foetus, Of the Catamenia (periods), which may not even designate full lectures.[211] By 1782 however, the final four sections of the course, which incorporated a number of lectures, were devoted to it: part 13 was: "The anatomy and physiology of the gravid uterus and foetus", 14: "The diseases particular to the sex", 15: "Of pregnancy and parturition", 16: "Of the disorders and management of women in child bed, and of children". For lectures on disease the change was even more stark. From having no specific lectures on diseased appearances in 1752, the course in 1782 had four sections of the course: lecture 10 was: "The diseases of the bones", 11: "The diseases of the viscera", 12: "Chirurgical diseases more particularly, and the operations of surgery explained and performed upon a fresh subject", and 14: "The diseases peculiar to the [female] sex". Note that only one of these lectures on disease required a fresh subject, the lecture on diseases cured by surgery. All of the others relied on the preparations Hunter had collected over the course of his career.[212]

Diseased appearances were not necessarily what Hunter had sought to collect, but given that in order to be a graverobbing victim one had to die of something, it is likely that interesting appearances caused by disease were found fairly regularly in the bodies the school acquired. Furthermore, it was common in this period for those carrying out post-mortems to retain interesting anatomical structures. Hunter received many such preparations as part of his editorship of his *Medical Observations and Commentaries* periodical.[213] The most striking aspect of Hunter's collecting of diseased appearances is that it enabled lectures on disease to become a significant part of this course, even though this was unlikely to have been his intention at the commencement of his career. And significantly for Baillie, they became a *separate* section of his course. The separation of disease from regular anatomy was very likely due to logistical reasons. The literal 'matter' of his course had increased so much that it was necessary to make adjustments in how it was taught. Practically speaking, it must have suited Hunter to teach regular anatomy first, rather than going back and forth between regular and irregular anatomy for each part. But there were theoretical reasons why this was a desirable structure for Hunter too. For Hunter, anatomy was *primary* to understanding the body's functions and therefore also where the body was not functioning in the regular manner. In this regard, Hunter's opinions were similar to other medical thinkers of the period, but in Hunter's

[211] White 1752 (published 1972), 99-110.
[212] In total five fresh cadavers, usually used over several lectures, were required for Hunter's course. *European Magazine* 1782, 166. On the use of cadavers for surgical teaching in the eighteenth century see: Kausmally 2012, 69-76.
[213] For example: Ludow and Hunter 1764, 85-101.

school this was specifically instantiated in a manner that was highly influential for the eventual shape and justification of Baillie's work.

Like others in the eighteenth century, Hunter placed great importance on understanding physiology. But for Hunter, physiological knowledge was only to be gained through anatomical study. Thus, he stated that the discovery—nominally his discovery—of the system of absorption in the body was "the greatest discovery, both in physiology and in pathology, that Anatomy has suggested, since the discovery of the circulation".[214] The study of the evidence of the body was paramount for Hunter, and he forcefully rejected what he saw as the sophistic study of physiology carried out at "most universities". There "many of the received hypotheses in Physiology, are built on very loose foundations, and liable to weighty objections; or, demonstrably repugnant to what we already know of the structure of our body". The problem was that "This species of philosophy" was insufficiently concerned with anatomy, with functions being unrelated to structure to the point of absurdity: "One thing, of peculiar properties and powers, has been explained by another, of different properties and powers, as absurdly, as if colours had been explained by sounds".[215] Such criticisms applied to the library-based work of Boerhaave: "There was never a man, perhaps, more followed and admired in Physiology, than Boerhaave. I remember the veneration he was held in; and now, in the space of forty years, his Physiology is—it shocks me to think in what a light it appears".[216] Hunter was rhetorically explicit in representing himself as against physiology as it was typically practised; against both "mechanical and chemical visions" that either argued on mechanical principles "from *dead* to *living* matter", or attempted to ascertain "the chemical changes produced in our juices, by experiments made on dead matter out of the body".[217]

Instead, Hunter argued for putting the 'facts' first. Importantly, this was not an anti-theorising position, but rather one that argued for the basis of physiological theorising to be the evidence of the body discovered by anatomy and related observations: as Hunter taught it, "the structure of the parts, and the known phaenomena, as *data*". In his classroom, hypotheses were then discussed "with the principal arguments that have been brought, either to support, or to overturn them". And "In some instances to give our own opinion with caution and reserve; but more generally to leave your judgements free, that enquiry and improvement may go on". By

[214] Hunter 1784, 59.
[215] Ibid., 94-96.
[216] Ibid., 98.
[217] Ibid., 96 author's emphasis.

only providing a "sketch" of physiology for his students, Hunter hoped to avoid the baseless supposition about the body's functions that plagued physiological study.[218] He went on:

> This plan rejects all declamation, all parade, all wrangling, all subtlety. To make a shew, and to appear learned and ingenious in natural knowledge, may flatter vanity: to know facts, to separate them from suppositions, to range and connect them, to make them plain to ordinary capacities, and, above all, to point out the useful applications, is, in my opinion, much more laudable, and shall be the object of my ambition.[219]

Note that there is no room for the narrative of patient encounters in this conception. Anatomy was the discipline through which sound knowledge about the body could be gained, so it was therefore the basis for physiological enquiry, which was theoretical.[220] Crucially, this position permeated his pedagogy and was explicitly taught to students.

But what of enquiry into disease? For Hunter, anatomical enquiry into regular and diseased cadavers was vital in understanding the nature of disease:

> The more clear and perfect our knowledge of every part of the body is, both in its sound and morbid state, the better we shall understand the nature, and strength, and tendency, of its diseases. Thence we shall more readily and certainly learn to discover a disease in its beginning; to obstruct its progress; to put it under difficulties; to prevent its gaining strength by the acquisition of auxiliaries; to cut off its supplies of necessaries; and finally to drive it out.[221]

The potentially wide-ranging application of the knowledge of regular and morbid states to the study of disease emphasises the primacy of anatomical investigation in Hunter's work. Furthermore, the evidence revealed by the dissected body and the dissected diseased body was epistemologically prioritised ahead of knowledge of "equivocal" symptoms, and theoretical knowledge: "it is by Anatomy *only* that we can arrive at the knowledge of the *true nature* of most of the diseases which afflict humanity".[222] The understanding of regular structure was vital to identifying irregular structure; the study of irregular structure was vital to understanding the 'true nature' of disease.

However, despite the priority Hunter gave to anatomy in the study of disease, this did *not* extend to him advocating a new type of study of disease by practitioners. Precisely how studying morbid states would lead to better understanding the true nature of disease was left

[218] Ibid., 97 author's emphasis.
[219] Ibid., 99.
[220] On anatomy as an 'experimental discipline' in the eighteenth century, see: Cunningham 2002, 631-665. On physiology as theoretical in the eighteenth century, see: Cunningham 2003, 51-76.
[221] Hunter 1784, 69-70.
[222] Ibid., 72 emphasis mine.

vague, with Hunter conceptualising this work within the framework of the case history as practiced by "physicians of the best character […] those who have the *art* itself, rather than the *craft* of the profession at heart". For example, Morgagni, whom he praised:

> This advantage, which we receive from Anatomy, of finding out the real disease after death, has been so generally adopted by the moderns, that the cases already published are almost innumberable: Mangetus, Morgagni, indeed many of the best modern writings in physic are full of them.[223]

Hunter therefore advocated for the continuation of the wider project of collecting cases, but with a crucial modification: that of a greater focus by physicians in the morbid states revealed by anatomical investigation:

> Were I to guess at the most probable future improvement in physic, I should say, that they would arise from a more general, and more accurate examination of diseases after death. And were I to place a man of proper talents, in the most direct road for becoming truly *great* in his profession, I would chuse a good practical Anatomist, and put him into a large hospital to attend the *sick,* and dissect the dead.[224]

Baillie developed Hunter's position by articulating a far more comprehensive account of the importance of anatomy for the study of disease than Hunter did, which had the effect of omitting narrative, so central to the writing of cases, from the consideration of disease. In his own introductory lectures, he explained to students that in the first instance, the purpose of studying anatomy was ultimately, for Baillie, to discover cures for disease:

> If there be a superior claim upon such grounds to any branch of knowledge, it is due to anatomy. It teaches the structure of an animal body, and explains its actions, as far as they are discoverable by the efforts of human ingenuity. If this only related to an animal in health, it would be more an object of curiosity than of real use. […] [However, it is] the chief guide in restoring health to a body deranged by disease![225]

Anatomy was the starting point for the study of disease because disease was uncertain—even more so than physiology. Baillie explained that disease might be a deviation of the body's function in general, or in specific parts. It might not leave a trace in the affected parts, or it may alter the structure of the body in some way. It all depended on the specific action of the disease. Either way, the most certain knowledge of disease stemmed from knowledge of the normal body, of anatomy and physiology, because the functions of the body in disease were always related to those in health: "A disease must always have relation to a healthy action, or healthy structure of parts, for *it is only a deviation from them*; so that a knowledge of disease would

[223] Ibid., 72 author's emphasis.
[224] Ibid., 73 author's emphasis.
[225] Baillie 1825, 80-81.

appear to rest on a knowledge of the body in its heathy state".[226] So, just as the proper pursuit of physiology required anatomy, so the proper pursuit of understanding of disease required knowledge of normal anatomy and physiology. Implicit within these premises was the requirement to know what the 'deviation'—the morbid anatomy of the parts—looked like too.

This position was more nuanced than Hunter's, but clearly built on his conception of the relation between anatomy and physiology. For Baillie, the path to better understanding disease was: if anatomy was the basis for reasoning upon *and discovering* the normal function of the body, so could morbid anatomy be the basis for reasoning upon *and discovering* the abnormal function of the diseased body if one knew their anatomy and physiology. Once one had grasped how a specific disease worked, one would have a sound basis for curing that disease. Baillie, building on Hunter, thus promoted a practice of studying disease that was analogous to Hunter's own promotion of the study of physiology. This did not contain narratives, as the post-mortem examination of cadavers as part of the writing of case histories did, but was instead located in the interactions of the anatomist with the diseased cadaver.

1.5: Conclusion

In the eighteenth century, there was not one approach to investigating disease, but many. The study of disease was not unified and did not simply become more anatomical, but developed differently across a number of intellectual projects that used a variety of methods. In this chapter I have focused on major figures who advocated through their pedagogy and practice specific approaches: the pursuit of cases histories incorporating post-mortem examination; the chemical study of disease; the classification of disease in nosologies; and the anatomical study of disease. This has not been an exhaustive account list, but it has been instructive. Primarily I have demonstrated that though the dissection of diseased bodies was widespread, it differed from the anatomical study of diseased bodies. But at the same time, I have shown that there were central points of unity across approaches, albeit differently instantiated. First, there was a near universal concern with what has been termed in this chapter 'academic theorising', which related closely to how practitioners undertook their study. Those like Boerhaave and Sauvages can be seen as being traditional medical academics in the respect that their medical theories were primarily built with the pen and the mind. In that respect Morgagni can also be seen as a traditional medical academic, as his work was primarily textual. Cullen too

[226] Ibid., 81 emphasis mine.

emphasised theorising in order to discover the causes of disease. Hunter and Pringle, on the other hand, advocated experiment—but nevertheless their positions incorporated theorising. These observations lead to a second point of concord: the prevailing attitude toward experimentation. Across all four projects examined in this chapter, observation and experiment were held in high regard. But in some cases more than others. So, Boerhaave was comfortable questioning Ruysch's anatomical findings on theoretical grounds. Cullen questioned the value of Lieutaud's observations as they were not systematised. Meanwhile, Pringle and Hunter made careers based on their medical experiments—Pringle on chemically investigating putrefaction, Hunter in anatomical inquiry.[227] In a somewhat middle position was Morgagni who, building on Bonet ,was concerned with producing an authoritative interpretation of the medical canon on disease at the same time as relying on his own and Valsalva's observations.

In part some of these differences in attitudes were related to the discipline that individuals specialised in. Chemistry was an important part of medicine in the eighteenth century and provided an alternative to anatomical investigation into the body during this period. Boerhaave advocated a chemical understanding of the body's functions that was influential in Pringle's research. Cullen's concern with causes, both proximate and remote, lent itself to chemical investigation ahead of anatomy. It is particularly notable that only one of the three individuals especially concerned with chemistry in this chapter undertook post-mortem examinations themselves. Even then, Pringle did so in the traditional manner, with the full case being explained alongside the post-mortem findings.

More broadly, physiology as a subject was theoretical in this period. Anatomical investigation and experiment provided the main source of observation for physiological theorising, but, whilst evidence was clearly important, argument was prioritised. Even William Hunter who, as we saw, prioritised the study of the body in physiological inquiry, did not advocate a different way of undertaking physiological study, merely a modified manner of going about it. The theorising was to take place after, and to be based on experiment—but theorising was still to take place.

These observations relate to the study of disease in this period in two ways. Firstly, the relation of anatomy to disease was not settled. We have seen that there were debates over the usefulness of anatomical findings that related to disease. It was not obvious to Cullen, for example, what the benefit of Lieutaud's work was if it did not systematise findings. Relatedly,

[227] Anatomy was at this time "fundamentally experimental". Cunningham 2010, 19.

we saw that Boerhaave's position on the glands changed from a chemical to more mechanical explanation of function (and thereby abnormal function). Similarly, Pringle's career in the second half of the eighteenth century was based on exploring disease chemically. Secondly, where anatomical investigation into disease did take place—typically the post-mortem examination incorporated into case histories—it did *not* correspond to an accepted theoretical framework. Morgagni retained humoral explanations for disease at the same time as emphasising in the title of his work that the seats and causes of disease were investigated 'through anatomy'. Even Hunter, who as we saw provided the key framework for Baillie's own conception of morbid anatomy, vaguely advocated a type of case history approach. Baillie's practice was quite different from other approaches to disease in the eighteenth century.

Chapter 2: Collecting Anatomy and Making Knowledge about Disease at Great Windmill Street

Sensory engagement with the cadaver using preparatory techniques by practitioners and students was central to the investigation and teaching of anatomy at the Great Windmill Street school. For anatomical inquiry the making of anatomical preparations was fundamental as structures were revealed to the anatomist's sight through their physical, tactile interactions with the textures of the body and the materials used to preserve it. In teaching, preparations housed on the museum's shelves and passed around the classroom visually displayed knowledge, whilst written accounts of preparations communicated the preparation's tactility to students. Pedagogical arrangements at the school were therefore organised around the student gaining a sensorial, embodied knowledge of the cadaver. As Carin Berkowitz has argued, in Hunter's classroom students were taught "'a way of seeing' systems of barely visible anatomical parts with clarity" through a 'system of display' which incorporated demonstrations of dissection and of viewing preparations and illustrations.[228] Then, once students had seen the structures of the body displayed, they were trained to be able to create such displays. This required students to gain an intimate personal knowledge of the textures of the cadaver and the effect of materials on it by sight and touch. Learning this provided students with the basis for anatomical experimentation as Hunter himself undertook it. In this chapter, I argue that Baillie's practice of morbid anatomy was fundamentally grounded in the practices of anatomy taught at Hunter's Great Windmill Street school. As Hunter's nephew, Baillie was soon ensconced in the life of the school, and became expert in its practices. Moreover, under Hunter he helped catalogue new additions of preparations for the collection, most of which were of diseased appearances. This work trained Baillie in describing preparations of diseased appearances as anatomical, emphasising their sensorial features, and generalising the knowledge represented by them. After Hunter's death Baillie continued the collecting practices of the school, but focused particularly on collecting disease. Baillie then used both of these collections together as the material basis for *Morbid Anatomy.* In the final section of the chapter I demonstrate that the content of *Morbid Anatomy* was fundamentally shaped by these collections, the collecting practices used to make them, and the cataloguing work used to organise the knowledge within them.

[228] Berkowitz 2013, 359-387. See also: Lawrence 1993, 154-178.

Making preparations was a practice central to anatomy in the eighteenth century. Originally, the techniques were largely kept secret by their practitioners who aimed to generate new discoveries through their specific techniques.[229] But by the time of the commencement of Hunter's medical education, the techniques were more widespread, and Hunter learnt them from a number of teachers. Practitioners making preparations physically engaged with the dead body and a range of materials designed to preserve it. In doing so, they gained tactile and visual knowledge of the structures and textures of the body. Finished preparations made structures visible, and the accompanying catalogues enabled textures to be recalled. Preparatory techniques were therefore crucial to the making of anatomical knowledge, whilst preparations were crucial to its presentation. Alberti has argued that such processes of "Fragmentation", as he terms preparatory practice, was "both a manual craft and a creative process".[230] Through physically manipulating the corpse using preparatory techniques, anatomical practitioners created experiential knowledge of the body experienced through their senses. Anatomy was thus a practice that defined the human body through the anatomist's sensorial interactions with the cadaver.[231] In his own anatomical inquiry Hunter used these techniques, and at Great Windmill Street taught students how to sensorially engage with the corpse. As I demonstrated in Chapter 1, Hunter's school was physically organised to retain as much information from the cadaver as possible. In other words, in the previous chapter I discussed the necessary condition for such work to take place—bodies, rooms, tools, materials. This chapter provides the sufficient condition: the work increased the scope of investigation into the body.

Anatomical investigation into the cadaver is difficult and messy—Adrian Wilson, when recalling his days as a medical student, once described the inside of the cadaver to me as 'a brown mess'. In such mess, it is difficult to tell which part is which. Book learning is and was insufficient. In the eighteenth century it was therefore necessary for anatomists to know how to differentiate parts in a decaying and bloody cadaver—which was necessarily singular in its nature—by sight and touch. Preparatory techniques could help in this regard, alongside repetition. They enabled parts of the body to be seen and felt in different ways. But this work required anatomists to know how parts reacted to materials like wax and mercury. Manual dexterity with the dissecting knife and other tools was required, as was a practical knowledge of mixing substances like wax with various types of dye, for instance. Overall, experiment was necessary. Experienced practitioners became sensitive to deviations and new findings, and

[229] Cook 2002, 223-247.
[230] Alberti 2011, 6-7.
[231] Hendriksen has termed this 'somatic tacit knowledge'. Hendriksen 2015, 55-56.

these became the basis for anatomical knowledge about the regular and irregular body. This relation between craft and inquiry was the mirror image of how students were taught. Rather than learning the whole before applying those lessons to an individual corpse, anatomical inquiry necessarily began with individuals interacting with a single cadaver. Preservation enabled an expansion of scope in these inquiries, as individual preparations were collected and compared to other similar preparations in museum collections.[232]

Cataloguing was another kind of preservation, and one that was key to Baillie's work. At Hunter's school, as well as learning how to engage sensorially with the cadaver through preparatory techniques, Baillie learnt how to catalogue that experience. Relevant visual and tactile elements of preparations were recorded as part of a definitive listing of what the preparation demonstrated to the viewer. Hunter's catalogue was organised around anatomy, according to his individual interests and goals. By contrast, Baillie's catalogue separated anatomy from 'morbid anatomy', representing his own goals in the production of knowledge.[233] Nevertheless, Baillie maintained the practices of collecting and cataloguing that he had learnt under Hunter for his own collection. This enabled the anatomical information contained in both to be synthesised by Baillie for his major work, *Morbid Anatomy.* The two collections worked as the material basis for his publication, with the cataloguing practices he had learnt becoming the basis for Baillie's generalised descriptions of morbid anatomy that emphasised the experiential and sensorial experience of the anatomist working with the diseased cadaver.

The chapter has three sections. In the first section, I focus on Hunter's work with preparations. I provide a narrative of his medical education in relation to preparations to emphasise that by the time he went to Paris in 1743, he had gained a good knowledge of preparatory techniques and an appreciation of the benefits of empirical investigation. This grounding saw Hunter make use of the availability of bodies primarily through experimenting with cadavers in the attempt to create anatomical knowledge, as I show in relation to his first paper published in the *Philosophical Transactions.* On the commencement of his teaching,

[232] At a certain scale this collecting formed what Alberti has termed a 'dividual body' in nineteenth-century pathology museums, where individual fragments were combined into a collection of fragments and reconstituted: "all the fragments on display together make up a multi-authored, diseased body". However, this required scale that was largely unavailable to Baillie. Instead Baillie remained cautious about drawing strong conclusions about his observations, preferring to present his observations systematically but without unwarranted speculation. Alberti 2011, 8, 71.

[233] As Bowker and Star argue, classification systems work to section, allowing the boxing of things or people that then work to promote knowledge production in relation to that section: Bowker and Star 1999, 101. See also: Siskin 2016.

Hunter taught students how to investigate anatomy as he did. This necessitated teaching students how engage with the cadaver sensorially. He did so both through displaying the body, and through enabling students to touch the body. But these processes were difficult. As I demonstrate in relation to a description of preparation by one of Hunter's contemporaries, Charles Nicholas Jenty, the processes were difficult and contingent on gaining dexterity with tools and a knowledge of the effect of substances like wax on the body. These difficulties were engaged at the school because Hunter did so himself, and he promoted such work to his students.

One student who undertook such work was Baillie. In the second section, I examine a document, 'Appendix to Hunter's catalogue of his anatomical collections' in Glasgow University Library Special Collections, that reveals the cataloguing work that Baillie did at the school for Hunter, as it was made by Baillie before Hunter's death in 1783. The document listed intended additions to the collection, most of which were of diseased appearances. This work was in two parts. In the first part, Baillie wrote descriptions of individual preparations that emphasised their visual and textural features. And in the second, he wrote general accounts of diseases that affected the bones where the collections of dried preparations were too numerous to list individually. Baillie thus learnt both how to describe individual instances of the diseased body anatomically, and how to make generalised descriptions of disease from individual preparations. This work became central to Baillie's presentation of morbid anatomy in print.

In the third section, I show that Baillie maintained the collecting and cataloguing work that he had learnt under Hunter for his own collection, which focused on disease. Able to access both collections, Baillie ensured that the information in both was sufficiently consistent to enable comparison and contrast by writing descriptions of preparations in the same manner that he did for the first part 'Appendix'. This work added breadth and depth to the scope of the existing collections, which I show through a focus on the collections relating to the liver and gall bladder at Great Windmill Street, allowing strands of collecting interest and difference to be traced between Hunter's and Baillie's collecting. Cruically, Baillie organised his own collection differently, reflecting his own goals in collecting by separating anatomy from morbid anatomy. His own goals manifested in his work *Morbid Anatomy.* In the work Baillie provided generalised descriptions of disease, in the manner of the second part of 'Appendix'. Baillie therefore produced an anatomical work on the subject of disease, which was materially based

on the collections at his disposal which resulted from decades of experiential and sensorial engagement with the cadaver at the school.

2.1: Making Anatomical Preparations at Great Windmill Street

At the core of the anatomical work at Great Windmill Street were anatomical preparations and their making. The techniques for making such preparations gradually became more widely known in Britain from the early seventeenth century. Hunter learnt these techniques from his various teachers during his education and soon applied them to his own anatomical inquiry. Using the example of his first paper published in the *Philosophical Transactions*, 'Of the Structures and Diseases of Articulating Cartilages', I demonstrate that Hunter used preparatory techniques to investigate the body experientially and sensorially. Furthermore, Hunter then taught his students how to do the same at his school. In lectures he displayed the body and discussed its texture. Then he taught preparatory techniques and provided students with cadavers of their own to experiment with. But this work was highly skilled and contingent on a series of tools and substances. Using an example from the eighteenth century, I show the difficulties involved with making anatomical preparations and argue that the process of learning to make them was primarily one of becoming sensitised to the cadaver and the various processes and substances used for its preservation. Hunter taught these complex and messy procedures because they were vital to his own work. Indeed, the techniques he taught to students were an amalgam of those he had learnt and those he had developed. And students used them. For example, William Cruikshank's work on the generation of rabbits emphasised visual and tactile information found at experiment. As I show in the next section, Baillie would go on to do the same.

By the 1740s the use of anatomical preparations in medical teaching was widespread across Britain, as the example of Hunter's own medical education demonstrates. After living with and agreeing to go into partnership with William Cullen in Hamilton, Hunter attended Edinburgh University, where he saw Alexander Monro primus lecture from November 1738.[234] Monro's lectures were supplemented with wet and dry preparations, as well as experiments on live animals, due to the lack of cadavers available to him.[235] In 1740, Hunter went to London

[234] Simmons and Hunter 1783 (published 1983), 2.
[235] Cunningham 2010, 133-134. Monro learnt the art of making preparations from William Cheselden and possibly Frederick Ruysch, and his preparations were likely at the cutting edge of the technology. Fenwick Beekman also claims that this was where Hunter learned "the underlying principles of making preparations", but

to complete his education. After a short stay with the man-midwife William Smellie, he entered the household of James Douglas, another man-midwife. There Hunter encountered, as one commentator described it, "the best collection of practically useful anatomical preparations (acquired, prepared, and preserved at vast expense, fatigue and care) that either is or ever was in the possession of a single man".[236] In Douglas's household Hunter assisted with dissections while Douglas was preparing illustrations for a planned work on the bones.[237] As part of this work, Hunter learned some preparatory techniques. For example, he likely learnt how to inject mercury into the body from Douglas.[238] Meanwhile, he furthered his education by becoming a surgeon's pupil at St George's Hospital under James Wilkie and a perpetual—that is permanent—pupil under Dr Frank Nichols. Nichols's private course of anatomy was well-renowned and consisted of around thirty lectures. Like Monro, Nichols relied on preparations in order to counteract the lack of bodies available for dissection. Nichols's course was focused on presenting the body theatrically through display to a gentlemanly audience, but nevertheless taught the latest medical theories.[239] Whilst Hunter later criticised the course for being too short, the preparations were in his estimation "very good" and demonstrated the parts well.[240] Furthermore, Hunter's later biographers Samuel Foart Simmons and John Hunter claimed that it was primarily "From the Dr. [Nichols] he [Hunter] learned his methods of making preparations, which was then a secret and every Pupil on this footing only was instructed in this art but they were bound to secrecy".[241] Specifically, Hunter learned Nichols's two injections: "a fine and a cours. The fine was the spirit varnish collourd and the cours was wax resin and turpentine which was a corroding injection".[242]

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this claim is insufficiently supported by evidence. Beekman 1950a, 81-82, 84. The use of animals in anatomy courses was very common as they were cheap and easily available: Guerrini 2004, 221; Guerrini 2015.

[236] Warner 1734 quoted in Simmons and Hunter 1783 (published 1983), 31.

[237] Simmons and Hunter 1783 (published 1983), 3.

[238] Douglas may have learnt this technique from Albrecht von Haller, who visited Douglas during his tour of Europe and had previously injected an epididymis with mercury. Hendriksen 2014, 539. Beekman 1950b, 187, 189.

[239] Guerrini 2004, 223-229, 237. Susan Lawrence has played down the importance of private anatomy schools in the late-eighteenth century by emphasising the increase in the number of anatomy courses given in hospitals. Lawrence, 1988; 171-192; Lawrence, 1996.

[240] Hunter 1784, 89; Simmons and Hunter 1783 (published 1983), 3.

[241] Simmons and Hunter 1783 (published 1983), 3. The requirement for secrecy presumably related to Nichols trying to maintain his position as the premier anatomy lecturer in London. He later sold his course of lectures to Thomas Lawrence which indicates that secrecy was a good way of monetising expertise. There is a parallel with Hunter's lectures 'publishing' his findings in a controlled environment. See: Porter 1985, 7-34. Historians Toby Gelfand and George C. Peachey have observed that Hunter was unlikely to have been able to dissect on Nichols's course. This does not necessarily extend to learning preparatory techniques, as they can be learned with animal cadavers, though not perfect for anatomical inquiry into humans. See: Peachey 1924, 59-60; Gelfand 1972, 102n.18.

[242] Simmons and Hunter 1783 (published 1983), 3. On corroding injections see: Hendriksen 2019 (preprint), 1-29.

By the time of Douglas's death in 1742, Hunter had, then, not only encountered a number of anatomists who made use of preparations for teaching; he had also, in Douglas, encountered such preparations as objects for illustration within anatomical inquiry. Taken together, he had therefore learned preparatory techniques required for both inquiry and pedagogy. In addition, Hunter attended lectures on experimental philosophy by the famous promoter of Netwonianism, John Theophilus Desaguliers, in London, absorbing his lessons on the value of empirical investigation ahead of theoretical wrangling.[243] Hunter had thus gained a grounding in the various benefits of preparations and experience of many of the available techniques for anatomical inquiry. More importantly, he had developed an intellectual basis for an approach to anatomy that was built on interacting with the cadaver as fundamental to anatomical investigation. Crucially, all of this preceded Hunter's travels on the Continent (his first visit took place in 1742), and goes some way to explaining his rather negative review of Antoine Ferreins' course that he attended in Paris, despite the course being similar in mode to that of Monro primus and Nichols:

> There I learnt a good deal by my ears; but almost nothing by my eyes; and therefore, hardly anything to the purpose. The defect was that the professor was obliged to demonstrate all the parts of the body, except for the bones, nerves and vessels, upon one dead body. There was a fetus for the nerves and blood vessels; and the operations of surgery were explained, to very little purpose indeed, upon a dog. […] The consequence was, […] all was harangue.[244]

As has been well documented, however, Hunter did value his time in Paris due to the unparalleled opportunity he had to dissect cadavers, possibly under the auspices of Henri François le Dran at the Hôpital de la Charité.[245] Hunter took advantage of this opportunity by experimenting with cadavers. That is, he used preparatory techniques to explore cadavers, learning better the lessons he had heard in Edinburgh, London, and Paris, as well as making discoveries of his own. This was documented by Hunter's first paper given to the Royal Society, 'Of the Structures and Diseases of Articulating Cartilages', published in 1743 shortly after his return from Paris in 1742. His discussion of articulating cartilages fundamentally relied on his use of preparatory techniques. Throughout the paper Hunter described his

[243] See for example: Desaguliers 1745.
[244] Hunter 1784, 88-89. See also: Peachey 1924, 78-79.
[245] Hunter "studied under the different teachers, dissected constantly, for dead bodies were hardly to be had in London, and went through the operations in Surgery which he often mentioned in lectures." Simmons and Hunter 1783 (published 1983), 4. See: Gelfand 1972, 99-130; Simmons and Hunter 1783 (published 1983), 33n.14; Arnaud 1768.

understanding of the structure and purpose of articulating cartilages in direct relation to the various preparatory techniques that he used, which I now summarise.

As Hunter put it, "modern Anatomists have gone further [in inspecting cadavers]: They have brought the Articulations [the joints], as well as the other Parts of the Body, under a narrow Inquiry", which he related to various methods "of bringing their fibrous Texture to View". In the paper, he outlined the various methods he had attempted. For example: "After some fruitless Attempts by macerating and boiling" he tried a different method, obscured in the original text but later reported by John Hunter as "braking[?] the cartilage which brought out its natural texture".[246] The sign of success—experientially gained—was "When an articulating Cartilage is well *prepared*, it feels soft, yields to the Touch, but restores itself to its former Equality of Surface when Pressure is taken off".[247] It looked like velvet "through a Glass" (a magnifying glass), and attempting "to peel the Cartilage of in *Lamellae*" was "impracticable", and force was needed.[248] The "perpendicular Fibres make the greatest part of the cartilaginous Substance" but "are not easily seen, because being very tender, they are destroyed in *preparing* the Cartilages".[249] Hunter explained that the membrane could be separated from the cartilage through maceration (soaking), while the capsular ligament could be "pulled up with a Pair of Pincers". Meanwhile, the blood vessels in these parts were so small that "till the Art of filling the vascular System with a liquid Wax brought them to Light" they were unknown, and even then they could not be demonstrated in adult subjects. However, "In very young Subjects, after a subtle Injection, they are very obvious".[250] In the final part of the paper, Hunter used the knowledge of the cartilage gained through these techniques to propose a better understanding of the diseases affecting these parts:

> It appears from Maceration, that the transverse Fibrils are extremely tender and dissoluble; and that the Cohesion of the Parts of the strait Fibres is stronger than their Cohesion with the Bone. When a Cartilage therefore is inflamed, and soaked in purulent Matter, the transverse or connecting Fibres will the soonest give way.

[246] Simmons and Hunter 1783 (published 1983), 4.
[247] Hunter 1743, 515 emphasis mine.
[248] Ibid., 515 author's emphasis.
[249] Ibid., 516 emphasis mine.
[250] Hunter 1743, 517-518. Hunter later stated that "he had been deceived when he thought he had injected the cartilages", Simmons and Hunter 1783 (published 1983), 4.

If this continued the cartilage might separate from the bone "where the Force of Cohesion is least, and where the Disease [ulcerated cartilage] soon arrives, by reason of the Thinness of the Cartilage".[251]

Furthermore, Hunter visually demonstrated several of his arguments in a figure attached to the paper. Figure 3 shows the back of the patella covered with smooth cartilage. At "AAAA" it showed "The Surface of the Cartilage, appearing, when the *Perichondrium* is removed, like Velvet", with B showing the bone, "C. The Thickness of the Cartilage, where the perpendicular Fibres are seen very distinctly" and D where the ligament joins the bone. The figure thus shows a well-prepared cartilage ("like Velvet") alongside the perpendicular fibres that Hunter said were "destroyed in preparing cartilages". It is very likely then, that the image was a compound of Hunter's experiments. It summarised and represented his experientially gained knowledge discussed in the paper.[252]

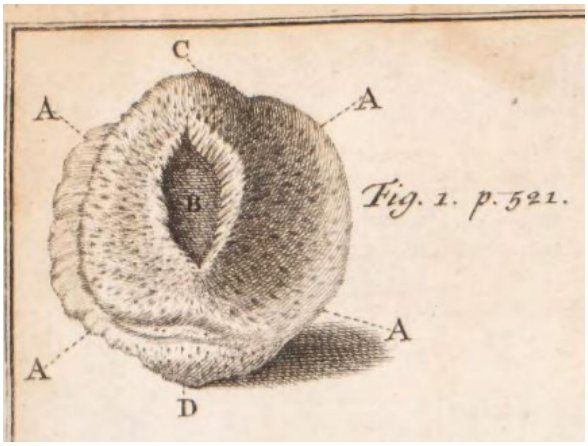

Figure 3: Posterior view of the patella, "where it is covered with a smooth Cartilage". William Hunter Table IV, Figure 1, *Philosophical Transactions* 42 1743.

In short, the paper made clear that with the bodies he had obtained in London and Paris before 1743, Hunter experimented by using techniques of preparation. Furthermore, much of the evidence he gained from these procedures was experiential and sensory: articulated cartilage *felt soft*, and *looked like* velvet through a magnifying glass; preparatory techniques were seen to both obscure (the perpendicular fibres) and reveal (the vessels of the cartilage); tools like pincers were used; techniques were both old (maceration) and relatively new

[251] Hunter 1743, 520-521.
[252] Hunter 1743, 521. There are a number of prepared cartilages in Hunter's anatomical collection, see: *Catalogue of Anatomical Preparations* 1770–1783.

(injection); and once regular reactions to preparatory techniques were known (transverse fibrils being very tender and dissoluble) irregular bodily reactions could be known too, again by preparatory techniques (when soaked, inflamed transverse or connecting fibres will give way first). Hunter then produced a visual demonstration of his arguments with his figure (Figure 3). This was anatomical knowledge presented in text and image located in the experience of the anatomist who experimented with the cadaver. In his teaching, Hunter taught students how to do the same.

Hunter began teaching in London in 1746, introducing this emphasis on the anatomist's personal interaction with the cadaver in his own teaching. Famously, Hunter brought, as Gelfand termed it, the 'Paris manner' of teaching anatomy back from Paris to London—that is, on his course every student would dissect a cadaver for themselves.[253] In the four-year period between Hunter's return from Paris and his commencement of teaching, his biographers emphasised that he "passed several years in acquiring such a degree of knowledge and such a collection of preparations as might insure him success" in teaching.[254] Certainly, Hunter was concerned with becoming an anatomy lecturer during this period. In 1743 he had approached Nichols with an offer to take over his course of lectures, only to find that it had already been promised to Thomas Lawrence on Nichols's retirement.[255] Precisely what Hunter did in between this setback and his commencement of teaching is open to conjecture, but what is certain is that Hunter took advantage of the dissolution of the Company of Barber-Surgeons in 1745 and the related lapse of the by-law that prohibited dissection outside of the halls of the company.[256] Now legally able to publicly—though discreetly—dissect, Hunter put his energies into readying himself for teaching, writing to his old mentor William Cullen in May 1746 that his "old scheme" of teaching now revived, was progressing whilst he worked at producing "a comprehensive System of Anatomy and Physiology, which will be necessary to be before me in the winter", ready for a new term's teaching that system in September 1746.[257]

Hunter ensured that his students learnt anatomy in the manner that he saw as best for investigation into the subject. As I demonstrated in Chapter 1, preparations were central

[253] On 'the Paris manner' see: Gelfand 1972, 99-130. See also: Porter 1985, 23; Richardson 1989 37; Cunningham 2010, 135-137.
[254] Simmons and Hunter 1783 (published 1983), 4.
[255] Beekman 1950b, 194.
[256] Gelfand 1972, 101. See also: Peachey 1924, 97-98. Beekman observes that neither Frank Nichols or James Douglas were subject to this by-law as they were Fellows of the Royal College of Physicians. Beekman 1950b, 194.
[257] Hunter quoted in Gelfand 1972, 99.

features of Hunter's lectures. Furthermore, Hunter taught preparatory techniques and, crucially, provided cadavers with which students could apply those techniques.[258] Ideally for Hunter, students would attend a complete course of lectures before attempting dissections so that they were sufficiently trained by him in anatomy.[259] During lectures Hunter used wet and dry preparations primarily to physically demonstrate anatomy. Preparations were also the epistemic grounding for specific anatomical points or arguments that Hunter wished to make. I discuss these uses here in turn.

Firstly, preparations were brought out and passed round the lecture theatre so "that that every student may examine them in his own hand", allowing students to closely see the anatomical structure being discussed *as it was* discussed. To facilitate this there were strict rules regarding the preparations' handling. Students were to confine their examination of the object to the specific structure in question—what Hunter wished for them to see, not whatever else the preparation might show—and they had to do so swiftly, so they would not lose their focus or delay the lecture:

> To prevent loss of time, when you give a preparation to your neighbour, be so good as to point out the *part,* or *circumstance* which is then to be examined; as I shall do, when it is first handed round: and every student will recollect, that he is to confine his examination to that part only; for, were he to speculate upon other things in the preparations, he would not only wander from the subject in hand, which would reflect upon his understanding, but he would detain the preparation too long from the rest of the company.[260]

Secondly, in the classroom recourse to preparatory techniques stood in for first hand physical interaction with the body by an anatomist and was sufficient for Hunter to ground his claims about the body. This is best demonstrated by Charles White's lecture notes made in 1752. In the lecture on the gravid uterus, Hunter gave an authoritative—prescriptive—answer to his students on what was a contemporary debate based on the evidence provided by preparatory techniques:

> In Quadrupeds the Placenta, is made up of two portions, one sett of Vessells from the Mother, the other from the Foetus, which being two distinct Systems, the Placenta may

[258] John Hunter claimed that his brother's first course was at least twice as long as any of his competitors, which helped him to receive twice as many students. There were in fact 48 lectures in his first course; still much more than the twenty to thirty given by his competitors. Simmons and Hunter 1783 (published 1983), 5, 32n.19.
[259] Hunter 1784, 108.
[260] Ibid., 112, author's emphasis.

> be injected either Way hence *we could Suppose by Analogy* that the Human Structure was similar, *if Injections did not prove the Contrary*.[261]

Here Hunter did not need to actually demonstrate this specific point with a preparation for its impact. His recourse to physical experiment and physical knowledge with injections—in this context equivalent to having a gravid uterus in front of the students—was enough.

In the classroom, Hunter therefore emphasised the dual role that preparations had in demonstrating anatomy: they could show known anatomy and reveal hidden structures. These roles were located in different kinds of sensory engagement with the cadaver: seeing visual information and feeling tactile information. Though in anatomical inquiry these sensory engagements with the cadaver overlapped, in the classroom they had to be taught separately. Learning the former was the purpose of Hunter's lectures—students would learn to see anatomy through displays.[262] At the same time, tactile information was discussed in lectures and so was flagged as significant, but was based on Hunter's authority. But because Hunter advocated understanding the physical evidence of the body as key to understanding it, and because that understanding was fundamentally based in the anatomists' physical, hands-on (hands-in?) interaction with the cadaver, it behoved him to teach preparatory techniques to students *and* provide cadavers on which students could practice. He did this from his earliest courses. The lectures on making preparations took place at the end of his course of lectures, *just prior to* students being given bodies to dissect for themselves.[263] Students were therefore intended to apply preparatory techniques in their subsequent dissection, using this skill in their own subsequent practice to gain a tactile as well as visual understanding of the body.

We have seen that using preparatory techniques enabled Hunter to investigate the body more fully, but these techniques were contingent on a series of tools and substances. By the late eighteenth century, tools were made specifically for the practice by instrument makers. The first surgical catalogue published by Laundy (his first name is unknown) in 1775 had a specific section for "all the tools required to make preparations".[264] This included details of the various sized pipes and syringes that could be made bespoke, depending on the desires of the anatomist. Due to the variety on offer, the entry was the only one in the catalogue not to assign

[261] White 1752 (published 1972), 101-102, emphasis mine. On the provenance of the notebook the introduction by Dowd in the same book.
[262] Berkowitz 2013, 359-387.
[263] See for example: White 1752 (published 1972); Heaviside 1771. On the anatomical content of Hunter's early lectures see: Simmons and Hunter 1783 (published 1983), 5-6.
[264] Laundy *Catalogs of surgical instruments* 1775.

a price to the tools.[265] Some specialised tasks required specialist tools. A later catalogue by Laundy offered a "Glass Tube with Steel stop-Cock and Pipes for Lymphatics".[266] Related to the injection of the lymphatics, Thomas Pole, who wrote a work on the art of making preparations published in 1790, designed an "*Injecting Tray*" that would prevent "the Loss of Quicksilver, which is constantly sustained".[267]

These tools were designed and used to facilitate the interaction of substances with the textures of the body. This facilitation was difficult. Substances were understood to have certain properties that benefitted the anatomical work being undertaken, and were necessary for the student to learn and engage with in order to successfully use preparatory techniques on the cadaver. Hendriksen has argued that the use of mercury for injection was initially related to its alchemical properties being viewed as similar to that of blood—what better substance to inject the vessels with then? Though this alchemical reasoning fell away in the course of the eighteenth century, linked to attempts at rendering the new chemistry more respectable, the material properties of mercury that made it a genuinely useful substance for injection remained.[268] Pole summarised the main advantages of mercury as a material for late eighteenth-century anatomists: "Quicksilver is often used for Anatomical Injections, on account of its minuteness, its permanent fluidity, and not being subject, like other fluids, to spontaneous evaporation". Yet Pole also highlighted the disadvantages of the material too: "The continuance of fluidity, whilst in the vessels, is one of the greatest objections to its use, as on this account it is impossible to dissect with any freedom among vessels filled with it"—mercury would too easily burst from vessels.[269] Materials were not simply useful for anatomists; they could resist their supposed utility.

With the difficulty of using preservation techniques in mind, it is worth considering an example of wax injection. In contrast to the active nature of mercury, wax was seen by contemporaries as a passive substance. Typically, beeswax, seen as the best kind of wax, was used for anatomical purposes. One of its most important properties was its ability to fix colours, which was crucial to both anatomical modelling and preparations. Wax anatomies made in the

[265] Laundy *Catalogs of surgical instruments* 1775. On the development of surgical tools in the second half of the eighteenth century see: Withey 2016, 113-129.
[266] Laundy 1795, 5.
[267] Pole 1790, 118-119 author's emphasis.
[268] Hendriksen, 2015; 47-50. Hendriksen states that the 'undesirable' part of alchemy—the belief in transmutation of metals—became the key distinction between the old alchemy and the new 'chymistry'. This distinction was not consistent with practice, but served to make respectable the new discipline. On the changes in chemistry in the eighteenth century see: Principe 2007, 1-22.
[269] Pole 1790, 87-88.

eighteenth century demonstrate that this property enabled the visual mimicry of the body and its textures.[270] In a wider context, wax was also used as a fixing agent in therapeutics (mercury was used as a therapeutic in itself, once again highlighting its active nature).[271] Wax was thus a malleable substance that could be used flexibly. When injected into something it was also seen by practitioners as being able to faithfully render its internal structure. A particularly revealing example can be found in George Cheyne's *Essay on Regimen* (1740). In his discussion of the human spirit (which was concerned with relating spiritualism with Newtonianism), he used the idea of wax filling up a conduit as a simile for the possibility of any character engraved into humans being overcome by nature, and the human spirit made like a *tabula rasa* as a result: "like Characters and Inscriptions engrav'd in the Substance of Brass or Marble, and filled up with Wax".[272] The notion that wax would perfectly fill up the engravings emphasises its conformity to the internal structure, a conformity that when coupled with its use as an effective fixing agent for the colours needed in anatomical injections was very well suited to faithfully revealing the cadaver's vessels.

But as the following example shows, this required much organisation, ability, and sensitivity by anatomists to the body's textures and materials used to investigate it. Charles Nicholas Jenty left possibly the earliest detailed account of using preparatory techniques in English in his *A Course of Anatomico-Physiological Lectures on the Human Structure and Animal Oeconomy* (1757). A relatively obscure contemporary of Hunter's, Jenty originated in France where he presumably gained similar anatomical experience to Hunter before moving to London in around 1745. He certainly taught anatomy and surgery from 1757, though likely earlier.[273] One method he used for injecting coloured wax into the vessels of "the cortical Part of the Brain, Tunica Choroides and the Vasculosa of the Eye, Periosteum of the Bones of the Ear, Vessels of the Teeth, and Tunica Villosa of the Intestines" required two different kinds of injection substance, several pieces of apparatus, as well as the involvement of one's whole body—hands, chest, senses, and sense of judgement. In brief: a fine and a coarse injection substance needed to be prepared. The fine injection was to be injected into the body first, and was essentially an oily coloured liquid that would harden when cool. It simply made up of "a

[270] On wax anatomies in the eighteenth century see especially: Maerker 2011; Dacome 2017.
[271] For example, Augustin Belloste, an army surgeon, recommended wax as part of a recipe for dressing wounds: Belloste 1713, 236. In *Aristotle's Master-Piece* a recipe containing wax was recommended as a cure for pain in the breast immediately after a woman had given birth: *Aristotle's Master-Piece* 1704, 166-167. On mercury as a therapeutic see: Hendriksen 2015, 52-53.
[272] Cheyne 1740, 319. On Cheyne see: Guerrini 2000; Guerrini 1985, 247-266.
[273] Calabrò 2012, 1-5; Thornton and Want 1978, 113-115; Berkowitz 2015a, 185-186.

Pint of Oil of Turpentine on three Ounces of Vermillion, or Verdigrise, according to the Colour you want" strained through a linen rag. The coarse injection would follow the fine. This was made up of more viscous materials that would work to force the finer injection into the minute vessels. It was made of:

> Tallow one Pound, white Wax five Ounces, Oil of Olives three Ounces; melt them over a gentle Fire, then add, of Venice Turpentine, two Ounces: When this is dissolved sprinkle in, of Vermillion or Veridigrise, three Ounces; and then pass all thro' a warm linen Cloth. When you design to make it run far in the Vessels, add some Oil of Turpentine immediately before you use it.

Once the vessel to be injected had had a pipe inserted into it and the vessel was tied off as required, both injection substances were then to be warmed whilst stirring. The coarse solution was to be "no warmer than what you can bear your Finger in" whilst the fine had to be near boiling. To facilitate this, the syringe "should be made very hot, by drawing boiling Water into it; and the Pipe within the Vessel may be heated with a Sponge dipped in boiling Water". To ensure that the practitioner did not burn themselves, a cloth had to be wrapped around the syringe. The fine injection, near boiling hot, was then ready to be made. To do so, one had to press the pipe of the syringe into the vessel entrance with one hand, grip the syringe with the other, and "then pressing your Breast against the Sucker, gently force it down". The anatomist had to press their chest down on the sucker slowly to a point where resistance could be felt, then force the fine injection out into the vessels before quickly injecting the coarser injection through the same syringe with force (though with consideration for the vessels potentially bursting). Lastly: "You must always remember to keep the Syringe in the Pipe which is fastened to the Vessel, till the Injection is grown cold; when there is no Danger of its running out".[274]

Thus, in learning how to make anatomical preparations, the student had to learn all of the operations involved, their specific order, as well as train their sensitivity to qualitative signs that allowed the anatomist to properly determine when the hot wax was ready to be injected, or the vessels were close to bursting, for example.[275] This was further complicated by the specific demands of applying these techniques to a decaying, naturally resistant cadaver. Whilst students certainly made use of their eyes as part of this sensory training, Jenty's descriptions

[274] Jenty 1757, clxix-clxxi.
[275] This mirrored the lessons that student chemists attending Gabriel-Francois Rouelle's lectures in Paris learned in becoming "sensitized" to such signs "to the point that they could use their bodies to detect all the subtle qualitative distinctions necessary to pursue chemistry with success". Roberts 1995, 506-507.

of preparatory techniques emphasised that this was combined with feeling: feeling heat, resistance, moisture, texture.

When Hunter advocated that all students make their own collection of preparations for their own practice ("I must likewise earnestly recommend it to every student, to make and collect as many anatomical preparations as he can"), it was with the retention of all of this information in mind. Preparations became useful references for both visual and tactile information, as his own catalogue of preparations demonstrates:

> The advantage which he will receive from such preparations, will not be confined to the few years which are commonly given up to the study of Anatomy; but in the course of his business afterwards, he will have occasion to consult them in many cases […]. I recommend this to students, with earnestness, because I do frequently find the advantage of it myself.[276]

Hunter's course was therefore built around learning and retaining anatomical information from cadavers in the same manner as he did. Seeing the evidence of the body was key, and was therefore the first step. But in order to understand the body fully, one had to be able to manipulate the body in order to see it in different ways. This required tactile engagement with the cadaver and the materials used in preservation, which in turn provided another source of anatomical evidence. In practice this meant that Hunter taught those preparatory techniques that he had learnt in his own education, as well as innovations of his own that his brother (writing much later) identified as:

- Improving the available tools ("The shape of the dissecting Knif", "The present dissecting[?] forceps; as also the length of the injecting pipe").
- Improving techniques ("the use of the Knif for then they dissected with scissors", "he of course improved the mode of injecting").
- Improving the materials used for injection ("[Hunter] increased the number of injections for liquid[?] that he had learn'd from Dr. Nichols").[277]

The records for Hunter's museum also contain a step-by-step guide to sealing the glass jars used there.[278] Alongside his own innovations, Hunter also continued to learn from other

[276] Hunter 1784, 110. It is notable that William Hunter did not recommend the production of preparations to his students for reasons other than reference. The production of them required skills that were different to typical dissection techniques, for example, but this is not mentioned. However, there is some evidence that other anatomists, Eduard Sandifort for example, made preparations to demonstrate their great skill as an anatomist, begging the question of why Hunter did not mention this point himself. See: Hendriksen 2014, 545.
[277] Simmons and Hunter 1783 (published 1983), 5.
[278] *Directions for Making Anatomical Preparations* 1831?.

anatomists. During his second trip to Europe in 1748 Hunter saw Albinus's "preparation of the membrane pupillaris, and those admirable injections, as he afterwards told Dr. Cullen, inspired him with a strong emulation to excel in that elegant and curious part of anatomy".[279] Such interactions were a key feature in the spread of preparatory techniques across Europe in the eighteenth century. Hunter engaged with others' work as a guide to his own, as evidenced by the wide variety of different types of preparation in his collection. Students were encouraged to emulate this by learning and using preparatory techniques.

The emulation of his work that Hunter encouraged can be seen in the work of his assistants at and outside of Great Windmill Street. William Cruikshank's inquiry into the reproduction of rabbits in 1778 used techniques like knifework and injection to see the reproductive organs of female rabbits at various stages of pregnancy, with the appearance and colour of the parts a central point of concern in his work. Texture was also of importance, though visual inspection was the focus in his paper given at the Royal Society on the subject.[280] Crucially, the resulting preparations from this work were retained in Hunter's collection (as he had paid for the rabbits), emphasising the dual role of preparatory techniques in revealing and showing anatomical information.[281] Note, however, that in anatomical inquiry, the construction of this dual role was reversed. Where in the classroom, students went from, in Alberti's terms, seeing a dividual body to an individual body, so anatomists undertaking their inquiries moved from an individual body to a dividual body.[282] Individual bodies could provide relevant anatomical information, but in order for that to be sufficiently general such that synthetic knowledge about the body could be made and communicated, similar individual cadavers had to be dissected. Once this had been completed satisfactorily, Hunter then incorporated such knowledge into his lectures and museum enabling other students to build further on this work. One such student was Baillie, whose work on disease at Great Windmill Street will be explored throughout the rest of the chapter.

[279] John Hunter also emphasised that Hunter thought many of Albinus's preparations too small, as well as commenting that Albinus was ignorant of many of his brother's techniques. Simmons and Hunter 1783 (published 1983), 6-7.
[280] Cruikshank 1797, 197-214.
[281] Entry "OO – Generation, Rabbits" in Hunter's catalogue. *Catalogue of Anatomical Preparations* 1770–1783. McDonald and Reilly 2015, 126. McDonald 2015, 102.
[282] Alberti 2011, 6-8.

2.2: Preparing Disease I: Baillie at Great Windmill Street 1780–1783

As a student and assistant to Hunter, Baillie was trained in making preparations and tasked with helping to organise the collection at the school by cataloguing it. A document Baillie complied, 'Appendix to Hunter's catalogue of his anatomical collections' (hereon 'Appendix'), now held in Special Collections at Glasgow University Library, is evidence of this. Specifically, Baillie wrote descriptions of preparations—the majority of which were diseased appearances—and wrote general descriptions of a series of preparations of diseased bones, explaining what they represented and their common physical traits. This section focuses on this document and its relation to the main museum catalogue as it reveals much about Baillie's work on anatomy and disease at Great Windmill Street prior to Hunter's death. I argue that Baillie's work on disease in the period from his arrival at the school in 1780 to Hunter's death in 1783 was fundamentally anatomical in the Hunterian manner. Furthermore, the two parts of 'Appendix' summarise well the lessons Baillie learnt at the school. In the first part, Baillie described the relevant knowledge present in individual preparations. This was both visual and tactile. In the second part, Baillie produced generalised accounts of osteological disorders in order to summarise types of similar object. As I show in 2.3, this cataloguing work shaped the form of *Morbid Anatomy.*

Baillie arrived at Great Windmill Street in 1780 and began learning the family trade after attending the University of Glasgow and having gained a scholarship to Balliol College, Oxford.[283] Though Baillie eventually graduated MD from Oxford, it was in London where he received the bulk of his medical education. As Baillie later summarised in his short autobiography, he was at first "entirely occupied with attending the Anatomical Lectures & Dissections [of William Hunter], and Dr Fordyce's Lectures on Chemistry". Over the next three terms he continued to attend "with great diligence to Anatomy" alongside several other courses of lectures, all from renowned medical lecturers on different medical subjects.[284] Whilst continuing to work on anatomy, he began "to teach a little in the Dissecting Room", soon becoming "Chief Teacher in the Dissecting Room" after two seasons of attendance.[285] His role there was to teach students in the techniques of dissection, aimed at students gaining a personal, intimate understanding of the cadaver, just as he had gained from his own practice.

[283] Baillie received a classical education from Glasgow and Balliol. Jones 2004.
[284] John Hunter on surgery, Thomas Denman and William Osborne on midwifery, George Fordyce on the practice of medicine, materia medica, and chemistry. Most of these lecturers had some link to a hospital but largely operated independently of them. Baillie 1818 (published in: Crainz 1995), 18. Lawrence 1996, Appendix I.
[285] Baillie 1818 (published in: Crainz 1995), 19.

According to Baillie, Hunter, who was "the best Teacher of Anatomy that ever lived", was "satisfied with my diligence" in the dissecting room.[286] At Great Windmill Street Baillie was soon an expert in Hunter's methods of dissection and immersed in the life of the school.

Baillie was also immersed in helping to organise Hunter's now vast collection of anatomical preparations. At some point before Hunter's death in 1783 he wrote a document, 'Appendix', that contained intended additions to the museum's catalogue and collection.[287] The document had two sections. The first section contained lists of preparations for entry into Hunter's main museum catalogue. These new entries were organised according to original categories in the museum catalogue.[288] For example, in Baillie's 'Appendix' the first three catagories were: "MM – Monsters, 55-67", "RR – Gravid Uterus, 406-429", and "CC – Female Organs, 109-116". The letters and numbers designated where the preparations in each category would be placed in Hunter's museum catalogue—after the preparations already listed in each category. The second section of 'Appendix' contained a series of descriptions of diseases and accidents affecting the bones with a rounded list of the numbers of preparations relevant to that disease included at the end. All of these descriptions appear in Hunter's museum catalogue. By contrast, from the first section of 'Appendix' listing individual preparations, only the preparations listed in "RR – Gravid Uterus" appear in the museum catalogue. In a later museum catalogue, complied by the trustees of Hunter's estate and edited by Baillie in 1785, all of the preparations in the first section of 'Appendix' are included, with further additions.[289] The 'Appendix' thus appears to have been written in the years before Hunter's death, and helps to reveal how Baillie engaged with Hunter's collection and individual preparations under Hunter's tutelage. I will therefore examine both of the sections of the 'Appendix' in turn.

In the first section, Baillie's 'Appendix' lists around one hundred preparations that were to be added to Hunter's working catalogue. These ranged across specific anatomical locations such as the eye, liver, and small intestine, incorporated both sexes specific organs ("Female Organs", "Testicle") as well as specifically identified pathological categories like "Aneurysm" and "Diseased Bones Wet".[290] Some of the preparations were animal (calf, fish, camel), but

[286] Ibid., 18-19.
[287] Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783.
[288] *Catalogue of Anatomical Preparations* 1770–1783.
[289] Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783; *Catalogue of Anatomical Preparations* 1770–1783; Fordyce, Pitcairn, and Combe *Catalogue of Anatomical Preparations* 1785.
[290] The full list was: MM – Monsters, RR – Gravid Uterus, CC – Female Organs, AA – Bladder, X- Kidney, U – Liver, EE – Brain, FF – Eye, GG – Nose and Mouth, KK – Aneurysm, LL – Diseased Bones Wet, Y – Testicle, O – Stomach and Oesophagus, P – Small Intestine, R – Great Intestine: Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783.

most were human. Significantly, virtually all of the preparations were of diseased appearances. Baillie was engaged by Hunter in writing descriptions of individual preparations of diseased appearances for placement within his existing anatomical catalogue and collection.

These descriptions emphasised the relevant knowledge-making features present in the preparation—what the preparation demonstrated to the viewer. In keeping with the museum catalogue, Baillie employed visual prompts and imagery in order to enable the reader to properly identify the appearance the preparation was intended to demonstrate. For example, in the liver category (which incorporated the gall bladder), Baillie listed: "60 A Cyst of the Liver containing a hydatid of the size of a small Lemon, which has smaller hydatids adhering to it". The identification of a third-party object intended to orientate the reader with the major feature of the preparation, but furthermore, this kind of visual information was also anatomical knowledge—cysts in the liver containing hydatids could grow to the size of a small lemon and could have smaller hydatids adhering to them.[291] Alongside visual information, Baillie recorded some tactile information—a particularly "smooth" kidney for example. But visual features were prioritised in this section, pointing to Baillie having been tasked with adding existing preparations to the collection, which naturally meant that only visual examination was possible in most cases, such as: "39[in]S[pirits]. A Fracture, apparently Fibula". Despite this limitation, however, Baillie paid attention to the physical response of the structure to preparatory techniques. For example, a calf eye "with the Cornea & a part of the Selerotica push'd back" showed "very distinctly" the membrana pupillaris. The preparation had been injected, but the membrana pupullaris did not contain the injection, "the injection not having reach'd it from the Choroid Coat".[292] Baillie knew that this was expected, his description emphasising that the preparation was an irregular structure. This example also serves to demonstrate that Baillie was well-versed in anatomy as taught at Hunter's school, an anatomy that prioritised the evidence provided by the cadaver through observation and experiment over all else.

As these descriptions were intended to be added to the existing working catalogue of the museum, their intended role at Hunter's museum is best understood in relation to that catalogue. Taking the example of the catalogue entries for the liver, we can see that what was being prioritised to add to the catalogue in Hunter's late career was disease. The section in

[291] Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783. On the role of metaphor in medicine see: Bourke 2014, 475-498.
[292] Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783.

Hunter's museum catalogue on the liver contained seventy-eight preparations, incorporating preparations of the gall bladder and other related structures. Of those preparations, forty were of regular anatomy, thirty-eight of diseased appearances. Twelve preparations stemmed from children or foetuses, four from animals, one was explicitly from an adult woman, and one explicitly from an adult man, with the remaining sixty preparations coming from undifferentiated adults. To this, Baillie's 'Appendix' was to add a further seven preparations from undifferentiated adults relating to the liver and gall bladder, all of diseased appearances. After these additions, on the subject of the liver, Hunter's famed anatomical collection would have contained more diseased appearances than regular.[293] To demonstrate the import of this, it is worth clarifying here the role of regular preparations in Hunter's collection.

In the museum catalogue's section on the liver, preparations of regular anatomy enabled the viewer to see the liver and relevant surrounding vessels and organs in a number of different ways. Anatomical information provided by individual preparations was compounded and expanded by a number of related, similar preparations that together made firm, trustworthy anatomical knowledge. This required preparations to be made in a number of ways. A key at the start of the catalogue listed the main way in which preparations were presented, including "S signifies in Spirits" and "P on a Pedestal under a Glass Cover" (see Figure 4). The catalogue was organised by organ. Each preparation was given a number, with the appropriate designation of preparation type immediately following the number of the preparation. Regular anatomy preparations usually preceded preparations of diseased appearances. Each entry was accompanied by a description. The description enabled the reader to distinguish between similar preparations in a series whilst also having the key features of that preparation emphasised for them. In the liver category, a number of preparations 'on a pedestal'—likely dried—made up a significant portion of the regular anatomy preparations. In their catalogue entries, emphasis was put on the preparatory techniques used to highlight certain parts of the preparation, enabling the reader to identify the preparation and what it was intended to demonstrate. For example:

> No.9a.P[edestal]. A Corrosion of the Liver supported on the Trunk of the Cava & seen on both sides arterial Hepatica black, Vena Portarum red, Pori Biliari yellow & Vena Cava Hepatica Green, they are nearly equally well injected the chief Excellency is the uniform & compleat injection of the Gall Ducts every thing pretty distinct.

[293] Alberti claims that hospital collections in the nineteenth century prioritised pathological anatomy, as regular anatomy was now collected for teaching purposes only. This example demonstrates that in certain locations, this process began earlier, raising questions regarding scale and pedagogy in anatomical collections. Alberti 2011.

Here, the various colours of the injecting fluid helped the viewer to see structures relevant to the liver that had, in turn, been revealed by the corrosion of the surrounding parts. This focus on preparatory techniques as revealing of anatomical information for the viewer was compounded by subsequent preparations in this series demonstrating "D[itt]o", such as:

> No.9b.P[edestal]. D[itt]o.____D[itt]o. The most beautiful regular & distinct Corrosion perhaps existing the artery is red the Vena Portarum cream colour & the Pori Biliari yellow the Cava Hepatica Green.

And gradually as the series of preparations continued, the whole anatomy of the liver was revealed in a virtuoso performance of 'beauty' and 'elegance':

> No.9c.P[edestal]. D[itt]o.___ the most elegant & minute Corrosion perhaps existing of the Liver lying on the upper side the under side only of course seen; the artery is white the Vena portarum Green, the Gall Ducts yellow & the Cava red, the Vena Portarum is the Chief excellency which has seen to great minuteness some of the branches as small as hairs. the Cava lying behind the Liver is compleat & the Hepatic Duct is seen of its natural size & nearly its whole length.[294]

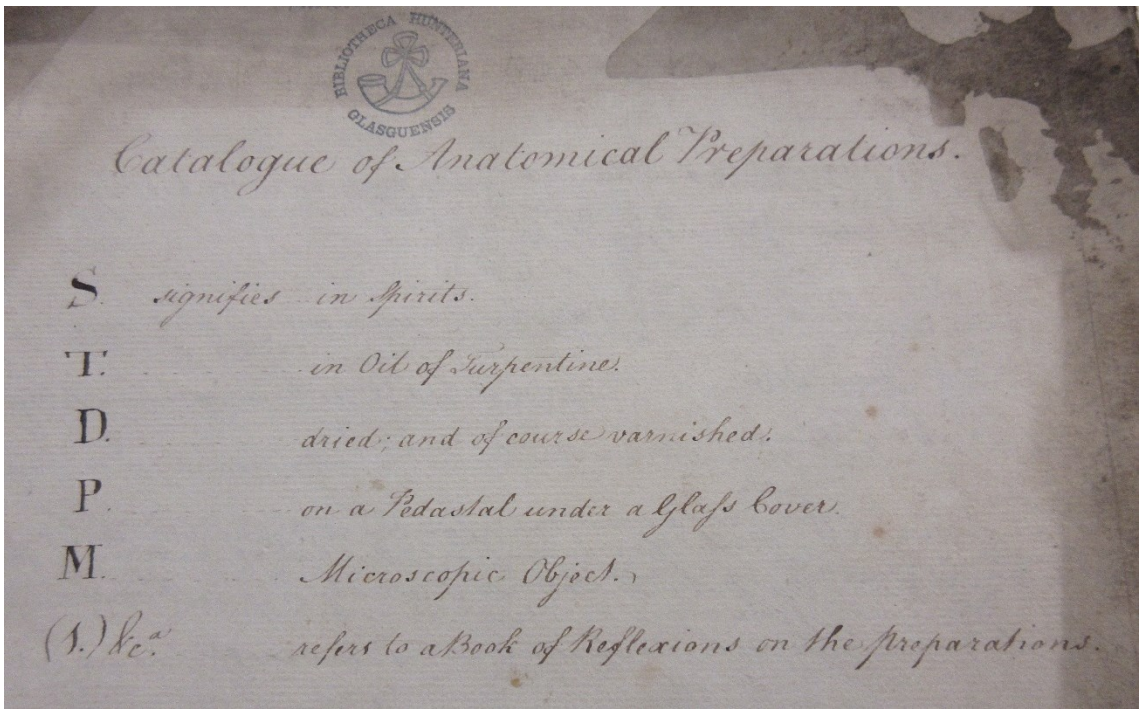

Figure 4: Key listing the types of preparation from a neat copy of the original catalogue. *Part of draft of Trustee catalogue of the Anatomical Preparations*, Hunterian Museum Records, Glasgow University Library Special Collections, c.1783–1785.

[294] *Catalogue of Anatomical Preparations* 1770–1783.

Preparations showing diseased appearances were treated like regular preparations in whatever way possible, subject to careful observation and experiment. Just like regular anatomy, preparations of disease were presented as being in serial with each other, such as:

> No.39.42.[40 and 41 struck out].S[pirits]. Hydatids from the human Liver the size of Gooseberries or Currants.
>
> No.42a. *Do.__ somewhat larger.*
>
> No.43.S[pirits]. Do.____ of the size of a Peach.[295]

This serialisation was not necessarily always possible however. Disease was irregular; the information contained in diseased parts necessarily individual. It was therefore unlikely that newly acquired preparations of disease would be able simply to compound the lesson of another, as the anatomist making preparations of regular anatomy could. In the category of the liver, the diseased appearances that were collected ranged from irregular formations of the liver causing new "net works" of vessels to form, to cysts and hydatids. Natural variety required preparations to be individually described. Descriptions of the diseased liver focused on the visual—a gall stone "the size of a cherry & of a brown colour", a "Cyst with the same kind of lining[?] of the size of Childs head"—included tactile information where relevant—"it cut like Cartilage"—and described the preparatory techniques used on the part—"injected red", "kept open by a Quill", "full of Mercury". Thus, for diseased appearances in the museum catalogue visual and tactile information, gained through experience with the body and preparatory techniques, was emphasised, similarities noted where possible, and anatomical knowledge about disease made.

Baillie's 'Appendix' added to this, increasing the breadth and depth of the overall collection. In the case of the liver, that was:

- Three further preparations showing cysts of the liver each with a different accompanying appearance (hydatids adhering to the cyst which itself contained a hydatid; bony matter in the cyst; a bag of coagulable lymph lining the cyst), two more of gall stones in the gall bladder (gall bladder filled with gall stones; gall bladder contracted around a small, black, irregular gall stone).
- A single appearance of "Earthy matter" in the coats of a gall bladder.
- A single ulcerated abscess of the liver.[296]

[295] Italics here designate Hunter's own handwriting. Ibid.
[296] Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783.

These additions meant that Hunter's overall collection contained seven preparations containing cysts of the liver, and sixteen of various types of gall stone. Alongside greater depth, the single preparations of unique appearances added breadth. Nevertheless, these were potentially comparable to other preparations in the collection due to the consistent language that Baillie used in describing the preparations. In the liver category, there were other preparations showing ulceration around the gall bladder, and earthy matter was also found around a cyst.[297] When considered together, the preparations of the liver in 'Appendix' showed more diseased appearances that were potentially comparable to other similar preparations, and they showed more of the same type of diseased appearances that enabled firmer conclusions on that appearance to be drawn.

The second section of 'Appendix' dealt with a greater number of preparations of dry, diseased bones. These entries also appear at the back of the museum catalogue, so were added to that catalogue before Hunter's death. In the catalogue, it was explained that there were too many preparations of this type to individually list. Instead, a description of the disease—which appears in rough form in 'Appendix'—outlined the typical features of the disease, before there was a list of preparations that demonstrated that disease.[298] Those descriptions were intended to stand in for an entire class of similar objects designated as showing the same disease. What these descriptions emphasised was the visual and tactile nature of the disease in question, for example:

> The disease of Rickets may be distinguished by the following circumstances, viz the bones are much lighter than they should be naturally and being less fitted for support they yield to pressure & become curved – If a bone be broken especially a cylindrical one which is affected with this disease the central cavity appears very large & the paricts[?] very thin often so much so as to be easily broken between the Thumb & finger – There appears therefore to be in Rickets a deficiency both of the cavity & animal materials which constitute bone.[299]

The bones *felt* lighter, and *yielded to pressure* being easily broken. They *looked* curved. When broken, the central cavity *appeared* to have large gaps in it, with thin sections of bone in between. Thus, Baillie's description was clearly the result of personal examination, and emphasised the visual and tactile information that it was the purpose of the school to teach.

---

[297] *Catalogue of Anatomical Preparations* 1770–1783.
[298] The full list of entries was: "Ricketts", Molities Ossium", "Incuration", "Hydrochephalus", "Anchylosis", "Fracture", "Exostosis", "Spina Ventosa". Also: "Diseased Bones Dry", "Inflammation", "Caries", "Expolation". Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783.
[299] Ibid.

Furthermore, the final sentence of the description employed the visual appearance of rickety bones as a good reason to conclude that rickets was a deficiency disease.

The list of preparations relevant to rickets that followed the description totalled fifty-nine, including two full skeletons. As before, individual preparations were described in detail where relevant. The example below was individually described because it demonstrated hydrocephalus (retention of water in the brain leading to distention of the skull): "A skull affected with rickets the cranium above being flatter & the fontanelle much more open than it should be resembling in this last respect a Hydrocephalous skull".

But the list condensed information too. Though diseased preparations were necessarily individual, they were described as demonstrating the same diseased appearance. Descriptions such as "4 Crania rickety", or "22 Thighbones more or less affected with rickets" thus rested on the general description of rickets to communicate their content as much as they provided evidence for that description.[300] The descriptions of collated preparations therefore confirmed the identity of rickets as much as they represented and expanded on its general definition. Taken together, the bones both showed the appearance of rickets and revealed the variety of different appearances the disease could take. Just as in Hunter's lectures, Hunter's catalogue prioritised in descriptions how the anatomist would interact with the part—visually and tactile. Baillie embedded this sensorial interaction within Hunter's catalogue, and would do so with his own collection.

2.3 Preparing Disease II: Baillie's Collecting of Morbid Anatomy after 1783

When Hunter died in 1783, Baillie inherited the school and its collection from his uncle along with Cruikshank. The stipulation on this inheritance was significant: Baillie and Cruikshank were given use of the museum and library for thirty years, after which the collections were to be moved to the University of Glasgow.[301] This would, in Hunter's view, mean that teaching at the school need not be interrupted whilst a new collection was built appropriate for the purpose. Baillie was thus afforded use of the collection over a long but limited period of time. Making his own collection was necessary if he wished to have a teaching career beyond this limit. In this section I show that Baillie continued to collect anatomically as Hunter had, but

[300] Ibid.
[301] Campbell 2015, 5-6.

now focused his collecting on disease. This shift was enabled through having available to him a large anatomical collection extant at the school for teaching. In his collecting, Baillie continued to treat disease anatomically, created preparations, and described them in his catalogue in the same way that he had for the first part of 'Appendix'. His collection, however, was organised differently to Hunter's, and separated regular from diseased appearances. This reflected the different conception of the study of disease that Baillie had (discussed in Chapter 1). Together, the collections increased the scope of knowledge about diseased appearances at the school, better confirming, expanding, and making anatomical knowledge about disease. This work formed the basis for Baillie's *Morbid Anatomy.* In the final part of this section, I demonstrate that the preparations held at the school were foundational for his claims. Just as for the second part of the 'Appendix', Baillie produced descriptions that generalised the findings of series of preparations. Thus, the work of making morbid anatomy preparations at the school—recording in object and text visual and tactile knowledge of the diseased body—was the basis for generalised knowledge about diseased appearances in *Morbid Anatomy.* This was circulated and built on by other practitioners in the late eighteenth and early nineteenth century in Britain.

After Hunter's death, Baillie continued to embrace Hunter's teachings by making the personal interaction with the cadaver central to his continued anatomical study in his own practice. On his own account from 1783 Baillie, when not giving lectures, "constantly superintended the Dissecting Room and explained during an hour the most important parts which had been dissected in the Course of a morning".[302] At the same time, he continued his medical education, becoming a surgeon's pupil under John Hunter in 1784. This gave Baillie access to another great collection, whose anatomical content was differently organised to that of his brother.[303] More significantly, in the same year Baillie began his association with St George's hospital, where he became a perpetual physician's pupil before being appointed Physician to the hospital in 1787. Baillie summarised the advantage of this appointment to his work on disease as aiding both his practice as a physician and anatomist. He was "not only as attentive as I could be to the Cases of my Patients, but embraced every opportunity of examining the Morbid appearances after death".[304]

[302] Baillie 1818 (published in Crainz 1995), 20.
[303] On John Hunter's collection see: Chaplin 2009. I do not focus on this collection as the archive materials relating to the cataloguing practices are somewhat obscure.
[304] Crainz states that there is no record of Baillie being a perpetual pupil at St George's. Baillie 1818 (published in Crainz 1995), 24; Crainz 1995, 24n.A.

The appointment at St George's, alongside Baillie's determination to explore the anatomy of diseased bodies there, was very likely significant in shaping his collecting of diseased appearances. In his autobiography Baillie recounted that due to the excellent collection of preparations already at the school, and Cruikshank having taught at the school for a number of years alongside Hunter, there was little change in the number of students they received. As he put it, "the influence of Dr Hunter's death was less felt than was expected".[305] Given that the course was run on similar lines, we can assume that the tried and trusted methods of acquiring bodies for the school—graverobbing—remained in place and that preparations were made along similar lines as before.[306] But his appointment at St George's offered Baillie a very specific opportunity: a potentially guaranteed supply of diseased parts and the possibility of seeing individual patients both alive and dead. In the event, Baillie made or could make only limited use of the latter opportunity. Few of the preparations in his own personal collection have their case histories described, though he did publish a few articles on such cases (see Chapter 3). However, Baillie does appear to have made use of St George's as a source for diseased parts. Naturally for such a secretive practice, there is no direct evidence of this, but indirect evidence is suggestive of Baillie's practice: archaeological digs have shown that hospitals were used as sources of bodies for anatomists during the century.[307] Furthermore, Baillie's collection was mostly made up of diseased preparations and contained, in certain areas, more preparations of disease than Hunter's collection, despite Baillie's preparations being collected in under half the time. For example, there were sixty-eight morbid preparations of the diseased liver and gall bladder in Baillie's collection, significantly more than the forty-five in Hunter's final catalogue complied by the trustees of his collection.[308] Lastly, a tantalising glimpse of the practice can be found in a catalogue that William Clift wrote on the "Drawings of Morbid Parts" now in the Royal College of Surgeons. Clift, the draughtsman for Baillie's *A Series of Engravings,* was very well acquainted with Baillie's preparations and discussed specific difficulties that arose in drawing morbid parts, including that damage could occur in the illicit work of stealing parts: "Diseased parts are generally stolen parts, therefore

[305] Baillie 1818 (published in Crainz 1995), 19.
[306] On the practice and social impact of graverobbing in the eighteenth century see: Richardson, 1989.
[307] See: Mitchell et al 2011, 91-99; Mitchell 2012, 1-9; Chamberlin 2012, 11-22; Kasumally 2012, 69-76; Fowler and Powers 2012, 77-94.
[308] Baillie's collecting most likely stopped or virtually stopped when he retired from teaching in 1799, meaning he collected preparations for sixteen years compared to Hunter's thirty-seven-year career. The preparations of the diseased liver and gall bladder were organised over three categories in Baillie's collection: "Anatomy and Diseases of the Liver", "Anatomy of the Gall Bladder", and "Hydatids of the Liver". Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, 59-67; Fordyce, Pitcairn, and Combe *Catalogue of Anatomical Preparations* 1785.

removed clumsily; and also removed from many of their attachments, which give them their proper form &c."—a clumsiness born of haste, no doubt necessary in a busy hospital.[309]

Whatever the precise source of Baillie's preparations, it is clear that Baillie focused on collecting disease extensively and systematically. As a result, Baillie organised his collection differently to Hunter. 'Morbid anatomy' became a specific heading under which preparations of disease were organised separate from preparations of regular anatomy. For example, the categories covering the stomach were: '2.E. Anatomy of the Stomach' and '2.G. Morbid Anatomy of the Stomach'. Where Hunter had collected disease as continuous with anatomy (there was a single category on the stomach for instance), Baillie foregrounded disease as an area of special concern. Those categories in Hunter's catalogue that were concerned with a single disease type—"LL – Aneurysm" for example—represented a specific inquiry at the school, often linked to a specific publication.[310] In Baillie's catalogue, the focus on disease was pervasive—morbid anatomy was treated as a subject in its own right.

This treatment of disease mirrored Baillie's overall view of the relation between anatomy and morbid anatomy. In Chapter 1, we saw that this conception was: morbid anatomy was the basis for investigating morbid action, just as anatomy was the basis for physiology (as Hunter argued). Crucially, the understanding of morbid anatomy and action rested on anatomy and physiology. Due to this formulation, Baillie grouped his categories into seven overarching meta-categories of physiological based groupings: Organs of Motion, Organs of Digestion, Organs of Circulation and Respiration, Urinary Organs, Organs of the Senses, Male Organs, and Female Organs.[311] Baillie's catalogue was therefore organised first around physiological function, before being split into sections on anatomy, morbid anatomy, and comparative anatomy.

Begun around 1790, the catalogue represents the solidification of Baillie's collection into its intended shape. Table 2 shows that Baillie had already collected significant amounts of diseased material—seventy-eight preparations on the morbid anatomy of the intestines for instance—and also that he foresaw the collection expanding in almost every category, as evidenced by the purposeful leaving of blank pages between catalogue entries. The blank pages

[309] 'Drawings of Morbid Parts' in: Clift *Catalogue of drawings in Cube IV, drawings of morbid parts* 1820.
[310] Hunter 1757, 323-357; Hunter 1762, 390-414; Hunter 1771, 385-387. See also: Chitwood Jnr. 1977, 829-836. Hunter's preparations relating to aneurysms are described in: *Catalogue of Anatomical Preparations* 1770–1783.
[311] Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, contents.

also suggest that Baillie envisaged needing more regular anatomy preparations in order to ameliorate for Hunter's collection being removed to Glasgow—the categories on the anatomy of the stomach and intestines, for example, all had two blank pages available for future use.

Table 2: Section from Baillie's *Catalogue* showing number of entries of preparations in the catalogue and the remaining blank pages. Matthew Baillie, *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London,* Catalogues of the Matthew Baillie Collection Series, Royal College of Surgeons of England, c.1790–1867, contents.

Category in Baillie's Catalogue	Number of entries	Number of blank pages
2. Organs of Digestion		
2.A. The Teeth	8	1
2.B. Comparative Illustrations of Teeth	2	1
2.C. Salivary Glands	6	1
2.D. Morbid Anatomy of the Gullet	6	1
2.E. Anatomy of the Stomach	10	2
2.F. Illustrations of Digestion	2	1
2.G. Morbid Anatomy of the Stomach	28	1
2.H. Comparative Illustrations	30	2
2.I. Anatomy of the Intestines	56	2
2.K. Morbid Anatomy of the Intestines	78	1
2.L. Hernia	9	1
2.M. Morbid Secretions from the Bowels	9	2
2.N. Intestinal Worms	33	1
2.O. Comparative Illustrations	23	1
2.P. Anatomy & Morbid Anatomy of the Liver	36	2
2.Q. Anatomy of the Gall Bladder	32	1
2.R. Hydatids of the Liver	5	1
2.S. Comparative Illustrations	6	1

With Hunter's collection already in situ at Great Windmill Street and used in teaching, Baillie focused his own collecting on expanding the collection of diseased appearances. To

revisit the example of the liver and gall bladder, Baillie's collection had three categories on those parts: 'Anatomy & Morbid Anatomy of the Liver', 'Anatomy of the Gall Bladder' and 'Hydatids of the Liver'. All three of these categories mostly contained morbid anatomy preparations. Indeed, there were only five regular anatomy preparations of the liver and gall bladder in Baillie's collection. We saw in the previous section that a number of dried appearances of the liver were highly valued by Hunter, as they demonstrated with 'elegance' the regular appearance of the parts. Baillie's lack of collecting in this area suggests that those preparations did the same work for him in teaching at Great Windmill Street. In collecting Baillie's focus was on improving anatomical knowledge of disease.

Baillie's morbid anatomy preparations not only increased the number of diseased appearances preserved at the school: they added further depth and breadth to the existing collections in four ways. (i) they provided confirmatory evidence; (ii) they provided new information; (iii) they provided additional evidence; and (iv) they provided new appearances. For the liver and gall bladder, Baillie's collecting increased the number of the collection's preparations of ulceration, tubercles, hydatids, gall stones, cysts, and irregular formations including contracted gall bladders. In doing so, Baillie's preparations added (i) confirmatory evidence to already collected appearances. For example, in Hunter's catalogue, ulceration can only be found in four preparations of the liver and gall bladder. Preparation 47h was gall bladder ulcerated at the posterior part, 47a was ulceration related to a cyst from the liver, 47g was ulcerated gall stones, and 59 (from 'Appendix') was ulceration around an abscess of the liver—all diverse findings.[312] There was only one addition of this diseased appearance in Baillie's catalogue (2Q2) but it was similar to 47h: a gall bladder showing signs of ulceration. The preparation thus served to act as comparison and confirmation of Hunter's earlier preparation.[313] Similarly, Baillie's additions added (ii) new information regarding the manner in which already seen diseased appearances manifested themselves. Cysts appeared in several of Hunter's preparations of the liver and gall bladder, with a number of different accompanying appearances such as "earthy matter" being deposited, or hydatids also accompanying the cyst. There are further examples of these in Baillie's catalogue, but also new accompanying appearances such as "cartilaginous" cysts. This expanded the range of appearances that cysts might take. Furthermore, (iii) new preparations of already collected appearances could add

[312] *Catalogue of Anatomical Preparations* 1770–1783; Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783.
[313] Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, 64.

depth to the collection. In Hunter's catalogue, one cyst contained bony matter (number 64 from 'Appendix').[314] Baillie's catalogue had a similar preparation that suggested that the potential cause of this appearance might be scrofula: "2Q4 A Cyst from the Liver, converted into bone in many parts, *containing scrofulous pus*".[315] Lastly, (iv) Baillie's catalogue included entirely new types of diseased appearance: mostly tumours of the liver (including fungus haematodes and fungoid tumours) and biliary calculi related to the gall bladder.[316] Baillie's collecting thus expanded the collections of diseased parts at Great Windmill Street in every direction.

These new preparations were entered into Baillie's catalogue in the same manner that he had entered the preparations for 'Appendix'. Descriptions focused on the visual. For example, 2P10 showed: "A specimen of the large white Tubercle of the Liver, taken from the thin[?] edge, to shew its appearance when covered with perutoneum, and as being more distinct than in other parts of the same Liver". Tactile information was also included where relevant. A different portion of the same appearance, separately prepared, was described as "a solid mass" with the coats of the gall bladder "much thickened". And preparations were presented in series as showing the same thing where possible:

> 2P13 Section of a Liver with several tumours of the fungus hamatodes character.
>
> 2P14 A similar preparation, shewing one large hard substance.[317]

As for Hunter's museum catalogue, diseased appearances were presented as a series of descriptions focused on sensorial information that emphasised the similarity between appearances wherever possible.

Baillie's continuation of anatomical collecting practices as well as the access he had to Hunter's collection played a central role in forming the content of *Morbid Anatomy.* First and foremost, the combined collections became the material basis for his descriptions. Thus, the eighteen preparations of hydatids of the liver in the combined collections (eleven from Hunter's, seven from Baillie's) were the basis for Baillie's statement that: "There is no gland in the human body in which hydatids are so frequently found as the liver, except the kidneys".[318] Of course, not every statement had such a comprehensive material basis, but

[314] Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783.
[315] Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, 64 emphasis mine.
[316] On fungus haematodes in this period see: Bertoloni Meli 2017, 109-113.
[317] Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, 59.
[318] *Catalogue of Anatomical Preparations* 1770–1783; Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867; Baillie

Baillie nevertheless confidently made conclusions based on the collections. His statement that hydatids were "usually found in a cyst" was explicitly supported by catalogue descriptions of seven preparations. Five in Hunter's collection (45, 45a, 46, 47 (museum catalogue) and 60 ('Appendix')) and two in Baillie's (2R1 and 2R5).[319] Moreover, the direct support of just one preparation (2R5) was sufficient for his statement that "to the touch" hydatids had "almost the feeling of cartilage".[320] This may seem too thin a basis for such a claim, but in fact emphasises the importance of Baillie's personal intimate knowledge of the diseased cadaver for his descriptions. Whilst the *recorded* material basis for this particular claim is indeed thin, the epistemic authority of such statements rested quite directly on Baillie's experience of such diseased appearances and his interactions with and interpretation of the collection. The descriptions in *Morbid Anatomy* were therefore similar to the work that Baillie undertook in compiling the second part of the 'Appendix'. Descriptions outlined the typical features of that kind of appearance, with the description intended to represent the information contained in the collection, which was anatomical information about disease.

But Baillie did not limit himself to just describing the anatomical information contained in the collections. He analysed it through: (i) comparisons, (ii) flagging particularly significant findings, and (iii) describing individual preparations in their own right. Comparisons (i) between individual preparations allowed Baillie to claim that the same appearance might be seen in different ways. For example, preparation 43 in Hunter's catalogue was of a cyst that contained an individual hydatid "of the size of a peach", whilst 2R5 in Baillie's catalogue was a cyst "containing several Hydatids".[321] Baillie's description in *Morbid Anatomy* went on to incorporate both of these observations as potential appearances: "In a cyst may be found one hydatid, or a greater number of them".[322] Findings in individual preparations were flagged where significant (ii) in order for the work to be comprehensive in its claims and this signalling also enabled Baillie to suggest causes for such findings. The "fluid capable of coagulation" that Baillie identified as composing the major content of hydatids was usually white, but due to preparation 45a in Hunter's catalogue containing "a brown membrane probably Coagulable

1793a, 150. Baillie noted that hydatids of the liver and kidney were likely to be different to each other, though they had the same name.

[319] Baillie 1793a, 150; *Catalogue of Anatomical Preparations* 1770–1783; Baillie *Appendix to Hunter's catalogue of his anatomical collection* c.1780–1783; Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867.

[320] Baillie 1793a, 150; Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, 67.

[321] *Catalogue of Anatomical Preparations* 1770–1783; Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, 67.

[322] Baillie 1793a, 151.

Lymph", Baillie expanded the definition to include that individual observation. This singular finding suggested that coagulable lymph was the coagulation fluid. This did not confirm any particular morbid action, but Baillie nevertheless included the statement due to its suggestive nature. He further supported the idea that the fluid was coagulable lymph by stating that: "I have occasionally seen some of a light amber colour".[323] Lastly, individual preparations were occasionally the subject of description in their own right (iii). We saw one such example (of 'an unusual formation of the ovary') in the opening to this thesis. Preparation 2P8 from his own collection was another: "A portion of a Liver, with a cyst laid open, which contains a soft earthy matter mixed with fibres or membranes not unlike the coats of a hydatid; the cyst is partly bony, partly cartilaginous".[324] In *Morbid Anatomy* Baillie specifically flagged this unusual appearance and provided explicit analysis of it, emphasising its unusual nature and the difficulty of properly defining it: "Upon the inside of a cyst, exactly resembling that which contains hydatids, I have seen adhering a white, friable, earthy matter; what was its exact nature, I cannot determine".[325] The work of making the museum collections remained relevant, as future collecting might determine the answer.

The work of making and cataloguing preparations at the Great Windmill Street school was therefore vital for the material of the work, the anatomical knowledge that material demonstrated, Baillie's descriptions of morbid anatomy, and his analysis. Baillie's work at the school both maintained and modified its practices in order to better undertake the study of disease as Baillie envisaged it. The separation of anatomy from morbid anatomy defined a different project to Hunter's, but this was ultimately an anatomical project. As this section has shown, the claims of *Morbid Anatomy* were specifically located in the 'morbid anatomy' preparations that Baillie had redefined at the Great Windmill Street school. The work of making those preparations—based in the experiential and sensory engagement of the anatomist with the diseased cadaver—became, in *Morbid Anatomy*, generalised knowledge about disease that came to be widely circulated and communicated. Thus, the interaction of several anatomists' bodies with diseased bodies at the Great Windmill Street school, recorded in preparation and catalogue before being generalised by Baillie in his book, became the basis for training other anatomists in what their own body would sense.

[323] Baillie 1793a, 151; *Catalogue of Anatomical Preparations* 1770–1783.
[324] Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867, 59.
[325] Baillie 1793a, 154-155.

2.4: Conclusion

Anatomical preparations and their making played a central role in anatomical inquiry and pedagogy in the eighteenth century. In the classroom, preparations could demonstrate known structures visually, while the catalogue could indicate their texture. In experiment, anatomists could use preparatory techniques to feel parts of the body in different ways, and see new parts. At the core of both of these roles were the senses and their engagement with the corpse by students and anatomists. Hunter's school was organised in order to enable students to gain this experiential, embodied knowledge first by training students' eyes through the use of 'systems of display' combined with authoritative lectures, and then by training their sense of touch through providing them with a cadaver for their learning after having them given instruction in how to explore the cadaver through preparatory techniques. Hunter advocated this approach because he himself used it. He encouraged his students to do the same in their own work.

Baillie explored the diseased cadaver through the techniques of preservation Hunter taught, both in text and material object. In compiling 'Appendix', Baillie was engaged by Hunter to catalogue the visual and tactile information preserved in preparations. These preparations were mostly of diseased appearances, giving Baillie experience of treating disease anatomically. In the first part of the document, Baillie produced descriptions of individual preparations that emphasised visual and tactile features. In the second part of the document, Baillie produced generalised descriptions of diseases that were demonstrated and defined by a large group of dried preparations of the bones. Again, visual and tactile information of individual appearances was prioritised in his description, but Baillie also grouped numbers of similar preparations together as essentially demonstrating the same thing, despite the individual instantiations of the disease necessarily being different. Sensorial information was thus embedded in Hunter's catalogue, and seen as consistent across preparations by Baillie.

After Hunter's death, Baillie continued the same practices of collecting and cataloguing, now focused on disease. In part, this was enabled by his work as Physician at St George's Hospital that gave him greater access to diseased cadavers than Hunter likely had. Baillie's cataloguing continued the practice of emphasising the visual and tactile features of preparations, as well as the similarities across them. Baillie thus treated his collection anatomically. But he organised his own collection differently, which reflected his own specific goals and interests. He separated diseased preparations from regular preparations in his

collection, creating sections of 'morbid anatomy' preparations throughout his catalogue. This reflected Baillie's wider understanding of how the study of disease ought to be undertaken, which differed from Hunter (as explained in Chapter 1). However, in writing *Morbid Anatomy*, Baillie made use of both collections, with the continuity of cataloguing practices enabling comparison and contrast between a large range of preparations. The scope of the combined collections provided a solid material grounding for Baillie's claims, but they ultimately rested on his own experiences with the cadaver. Significantly, the descriptions of disease were generalised descriptions based on the existing collections, in the same way that Baillie had produced descriptions for the second part of 'Appendix'. The form and content of Baillie's book was therefore intimately linked to the collecting and cataloguing at the school.

But in publishing *Morbid Anatomy* Baillie's stated aim was to improve the understanding of disease, not anatomy: "as we shall become acquainted with the changes produced in the structure of parts from diseased actions, we shall more likely to make some progress towards a knowledge of the actions [of disease] themselves".[326] I have argued in this chapter that Baillie learnt and utilised the anatomical procedures of preservation for his work on disease. This emphasised experiential and sensorial interactions with the diseased body. Thus, for Baillie, morbid anatomy was an undertaking that used the techniques and skills of anatomical inquiry, and could be catalogued alongside anatomy, but it was a separate undertaking aimed at a very different goal: to improve knowledge of disease.

[326] Ibid., ii.

Chapter 3: Publishing Morbid Anatomy and Publishing *Morbid Anatomy*

At the Great Windmill Street school Baillie practised morbid anatomy, and in his major publication, *The Morbid Anatomy of Some of the Most Important Parts of the Human Body* (1793), he represented this practice in print. To do so, Baillie published a text-only work of anatomy on the subject of disease utilising a genre that I term the 'instructional anatomical description'. In writing such a work, Baillie employed common features of anatomical works in his own. For example, he structured the work like an anatomy book, and produced descriptions of the internal structure that were presented as applicable to other similar bodies. But before he did so, he presented his work on disease in other ways. His earliest papers, published in the *Philosophical Transactions* and *Transactions for a Society for the Improvement of Medical and Chirurgical Knowledge,* were written as case histories, a different genre. In writing these papers, Baillie employed features of cases such as providing a narrative—even if only theoretically realised—to the case, and providing detailed descriptions of individual bodies examined post-mortem. Both of these presentational strategies worked to emphasise the epistemic content in Baillie's work, but did so in different ways for different purposes. As I argued in Chapter 1, the writing of cases was the most common way of presenting work on disease in the eighteenth century. Baillie's early papers thus presented his work as in keeping with the prevailing standards, which was, in line with Gianna Pomata's work, to 'think in cases', working to improve physicians' patient encounters.[327] But as I argued in Chapter 2, the practice of morbid anatomy that Baillie undertook was fundamentally anatomical. He 'thought in anatomy' regarding disease, and so in his major book on the subject, presented his work as anatomical, as well as outlining an alternative way of studying disease that began with anatomical investigation. His vision, communicated through genre, advocated moving the focus of the study of disease from the bedside of the patient to the dissection room. As a result, Baillie's work was criticised by some of his contemporaries who promoted the continued pursuit of case histories instead. The uses of genre in the extension or challenging of norms of practice were thus central to debates around how the study of disease was undertaken in this period. In this chapter, I argue that Baillie employed a different genre to the usual in order to challenge normative practice in the study of disease.

[327] Pomata 2014, 1-23. See Introduction.

This argument builds on Gianna Pomata's concept of 'epistemic genre'. As she describes, epistemic genres are distinct from literary genres as their authors have cognitive, rather than aesthetic or expressive, aims in writing their works. These texts develop alongside practices, and are designed to contribute to the practice of knowledge-making as it stands within that specific cultural context.[328] Her specific example is that of the case history narrative. She has argued that the purpose of writing and publishing in the genre of 'case history narratives' was to improve the practice of physicians in the treatment of their patients.[329] Writing in cases enabled physicians to compare and contrast like cases to discern key symptoms, the best methods of treatment, the course of disease, and likely findings at post-mortem. The narrative and temporal features of cases were vital in such considerations, which gave cases further applications for medical practitioners such as comparing the patient's presenting symptoms with post-mortem findings in order to ascertain the proximate cause of the patient's death. Case histories were thus closely related to the practice of the physician. And indeed, they were the main way in which physicians in the eighteenth century discussed their practice. Famous works by Bonet, Lieutaud, and Morgagni (explored in Chapter 1) were especially prominent in that regard, but many other works on disease contained cases, and periodical publications like *Philosophical Transactions* also published individual case histories. In the eighteenth century, the case was the main vehicle through which the treatment of disease and its understanding was discussed.

Baillie's decision to publish *Morbid Anatomy* in the instructional anatomical description genre was an attempt to change how the study of disease was undertaken. Through writing an anatomy book on disease, Baillie attempted to shift the manner in which the study of disease was carried out by making it intelligible in a different format to the case history. Baillie's understanding of morbid anatomy was based on his experiential, sensual, interactive knowledge of the diseased cadaver. In that regard, it was anatomical knowledge, but such knowledge of disease was—as Baillie himself highlighted—unusual in the eighteenth century. His ability to then generalise from his knowledge of diseased cadavers in order to describe typical diseased states of the body was central to the content of *Morbid Anatomy*, but unfamiliar within his contemporaries' case histories. As a result, he used the form of works in the instructional anatomical description to ensure that contemporaries would view his book as intelligible. From that point, the utility of content in improving knowledge of disease would

[328] Ibid., 2-3.
[329] Ibid., 7-9.

become more apparent. Genre was thus a key way in which Baillie promoted his own vision of the study of disease. This was not intended to completely supplant cases, as Baillie praised Morgagni's work of cases, for example. But it was intended to improve practice through challenging the traditional approach, which Baillie viewed as being deficient in its descriptions of the findings at post-mortem.

Nevertheless, the presentation of the study of disease as anatomical came under criticism from contemporaries. Reviewers in Britain viewed the move away from cases as undesirable at best and questioned the utility of the work, as well as Baillie's quality as a physician. It was, however, seen as useful for students in their dissection work. Meanwhile, the Prussian Samuel Thomas von Sömmering (1755–1830) viewed the plan of the work as highly satisfactory whilst taking issue with some of the content. The varied reaction reflects the heterogeneity of the study of disease in this period (see Chapter 1), and also points to contemporaries fully grasping both what Baillie was doing and why he was doing it. Genre was thus a key way in which changes in practice could be communicated.[330] The mixed reaction to Baillie's work was symptomatic of the controversial nature of Baillie's suggestion.

The presentation of *Morbid Anatomy* as an anatomical work was central to its success and to the promotion of morbid anatomy as a practice in Britain, which will be explored in Chapter 5. But this presentation was not an inevitable consequence of Baillie's anatomical approach to disease, but rather a specific strategy designed to promote his practice. In that regard, Baillie's early papers are instructive. As I demonstrate in the first section, they were written as cases. This made their epistemic content more widely acceptable as Baillie's work adhered to the epistemic standards of the Royal Society and the Society of the Improvement of Medical and Chirurgical Knowledge, the two locations where Baillie presented his papers. In both of these locations, Baillie's specific focus on morbid anatomy was unique, but his presentation of it fitted with the expectations of each society in order to render the work trustworthy to the audience. This included Baillie utilising strategies that his uncles advised him to employ, which Baillie did for his own purposes. Baillie's work was mutable in different contexts, with genre being a tool through which he could frame his work for contemporaries.

The second section of this chapter demonstrates that *Morbid Anatomy*, unlike Baillie's periodical publications, was a work of anatomy on the subject of disease. I show that the book had many of the same features of anatomical books by comparing Baillie's work with Hunter's

[330] See: O'Connor 2007, 229-230.

An Anatomical Description of the Human Gravid Uterus (1794). The features in Hunter's work used by Baillie included: the removal of the narrative element of the patient encounter that was so central to case histories; the presentation of the descriptions as applicable to other similar bodies; the orientation of the reader in the body; the production of comparisons to enable comprehension; and lastly the provision of further details to extend the scope of the information provided. Overall, these features worked to assert the generality of the description provided, and emphasised the anatomical content of the work. However, the nature of the study of disease also worked against this presentation at times. Baillie discussed clinical features as well as cases in his work that worked against this generalisation by highlighting the multifaceted and complex nature of disease. These features were included because they were relevant to morbid anatomy or morbid action, but they were singularities in a work that otherwise emphasised the applicability of morbid anatomy across similar bodies.

In the third section, I demonstrate that Baillie's book came under considerable criticism from his contemporaries causing him to make substantial changes to the second edition of the work. British reviewers criticised the work for not being one of cases, though they praised aspects of its content. Meanwhile, Sömmering criticised some of the work's content whilst praising its plan, its genre. This criticism greatly informed the changes that Baillie made to the second edition of the work, published in 1797. He expanded the work, improving on its content and making additions too. The most notable and largest addition was that of general descriptions of symptoms that accompanied the diseased appearances, which had been suggested by British reviewers as a potential point of improvement for the work. In addition, Baillie flagged Sömmering's work in translating and expanding his own as an important influence in the improvement of his own. However, he made these improvements whilst maintaining the integrity of his original intentions. The descriptions of symptoms were placed after the descriptions of morbid anatomy, continuing to disrupt the narrative of cases so central to his project of promoting anatomy. And, he ensured that his claims remained based on his own observations and reading, rather than using Sömmering's additions. The result was that the second edition of *Morbid Anatomy* continued to make the same case for changing practice in the study of disease as the first edition had whilst being more amenable to other authors' needs which was vital to its long-term reception, as we will see in Chapter 5.

3.1: Baillie's First Papers, 1788–1791

Baillie's first papers published in periodicals were cases. In that regard, Baillie made his work conform to prevailing expectations in publishing on disease. His cases were all concerned with disease, and underlined that they were ultimately concerned with unusual appearances found during dissection including morbid anatomy. Baillie's presentation of these findings as case history narratives was a reflection of the audiences for whom he published his papers; the societies where he presented his work expected cases in papers on disease. I argue that in presenting his work in this manner, Baillie was 'in genre'.[331] In other words, he was writing in keeping with the expectations of periodical publications on anatomical singularities in this period. Palmira Fontes da Costa has demonstrated that at the Royal Society 'public examination' of 'matters of fact' was central to producing acceptable natural philosophical knowledge regarding 'monsters'—singularities that we would now typically consider congenital birth defects. Authors who wished to report on monstrous births would employ 'literary strategies' such as stating that they owned the subject, modesty in their aims, confessing difficulties in aspects of their work or reporting, and extensively describing the subject in order to enable a 'virtual witnessing' by fellows of the Society at their meetings. This applied to other singularities such as diseased appearances, which it was necessary to separate from 'true' singularities.[332] Baillie employed these strategies in his own papers where he represented diseased findings as singularities within a narrative context, alongside the strategies of his uncles, William and John Hunter. For example, whilst presenting at the Society for the Improvement of Medical and Chirurgical Knowledge, Baillie ensured that his papers fulfilled the aims of the society, and so used his papers to discuss improvements to knowledge of the animal 'oeconomy' and therapeutics, as John Hunter did. At the same time, Baillie made use of William Hunter's advice in producing large illustrations. Nevertheless, Baillie ensured that his papers were distinct from his uncles by emphasising the material basis for his work, alongside presenting his own arguments. When Baillie's presentation of his papers as cases is considered alongside *Morbid Anatomy*, it demonstrates that the manner in which Baillie presented his work and *the kind of work it was*, was mutable depending on the intended audience and his aims in publication.

[331] As Nicholas Pethes argues, the use of specific genres "is shaped by an anticipation of the reader's expectations". Pethes 2014, 26.
[332] Fontes da Costa 2002, 268-269. On 'virtual witnessing' see Shapin 1984, 492, and Shapin and Schaffer 1985, 60-65.

Baillie gave six papers prior to the publication of *Morbid Anatomy* in 1793. Their titles reflect well that their focus was morbid anatomy. 'An Account of a remarkable Transposition of the Viscera' and 'An Account of a particular Change of Structure in the human Ovarium' were read in 1788 and 1789 and published in the *Philosophical Transactions* of the same year.[333] All of his other papers given before the publication of *Morbid Anatomy* were read at the Society for the Improvement of Medical and Chirurgical Knowledge between 1788 and 1791 and published in 1793 in the first editions of their transactions. The latter society was an exclusive group set up by John Hunter and George Fordyce intended to bring the work of physicians and surgeons together, especially in publication, for the wider attempt at improving overall medical knowledge. The papers Baillie presented there and published by the society were:

- 'On the Want of a Pericardium in the Human Body' (read 1788).
- 'Of uncommon Appearances of Disease in Blood vessels' (read 1789).
- 'Of a remarkable Deviation from the natural Structure in the urinary Bladder and Organs of Generation of a Male' (read 1790).
- 'A Case of Emphysema not proceeding from local injury' (read 1791).[334]

Together these publications covered 'remarkable' appearances and deviations, particular changes in structure, parts missing, unusual appearances, and in the last case, it was highlighted that it was a case that could *not* be understood by examining a specific part of the cadaver but rather the whole. Together these publications were concerned with morbid anatomy.

But Baillie nevertheless framed these papers as case history narratives; the content concerned specific findings akin to singularities. The first paper he published (on 'a remarkable Transposition of the Viscera') is instructive in this regard, even though it did not describe a patient encounter. Baillie began the paper by presenting his subject as akin to a singularity. The subject was "so extraordinary as scarcely to have been seen by any of the most celebrated anatomists".[335] From there, he emphasised that his aims were modest, only wishing to present a "sufficiently particular" account of the transposition—that is, where the body's internal organs are on the opposite side to normal—in order that it could be deduced if the part "is a

[333] Baillie 1788, 350-363. Baillie 1789, 71-78. Crainz has pointed out that both papers were republished in abridged from in *Philosophical Transactions* in 1809, and in other publications. See Crainz 1995, 119-120.
[334] All of these papers were published in a collected volume: Baillie 1793b, 91-102; Baillie 1793c, 119-137; Baillie 1793d, 189-201; Baillie 1793e, 202-211.
[335] Baillie 1788, 351.

change in the situation of some viscus from disease" or not.[336] Baillie then provided a brief narrative regarding the acquired subject. This both hinted at the subject's prior life and highlighted the number of witnesses to the dissection that were present:

> The person who is the subject of this Paper was a male, near forty years of age, somewhat above the middle stature, and of a clean active shape. He was brought for dissection in the common way to Windmill-street. Upon opening the cavity of the thorax and abdomen, the different situation of the viscera was so striking as immediately to excite the attention of the pupils who were engaged in dissecting it; and Mr [William] Cruikshank, as well as myself, were very soon informed of the singularity.[337]

Baillie then discussed in detail the pains he took in examining the cadaver and retaining its information, in part through the use of preparatory techniques and also through producing an illustration: "I began immediately to examine every part of the change with considerable attention: for this purpose, after desiring a drawing to be made of the appearances as they were found upon opening the body, I next day injected it".[338] The bulk of the paper then described the cadaver in detail, though Baillie was careful to ensure that he did not include "unnecessary minutiae" in his description. In a paper intended to adhere to the Royal Society standards of describing singularities—incorporating modesty, narrative, witnessing—description had to be close but careful. Giving too detailed an account would demonstrate a lack of discernment in the natural philosopher regarding relevant information and "would render the Paper less suited to the Society".[339]

The material that Baillie discussed in his papers often did not lend itself to being presented as a case history, but in periodical publications Baillie nevertheless presented his material as a case history. Baillie's next paper published in the *Philosophical Transactions*, 'An Account of a particular Change of Structure in the human Ovarium', is a case in point. All of the information Baillie had about the cadaver prior to dissection—because it had been received by the school in the 'common way'—was based on the individual's outward appearance: "a female child, about twelve or thirteen years old, which was lately brought to Windmill-street for dissection".[340] The individual clearly had not been seen by Baillie whilst alive, so knowledge of the individual's illness, symptoms, and the course of disease (if she had

[336] Ibid., 352.
[337] Baillie 1788, 352. Whilst not made completely explicit, it appears that the cadaver in question was one that had been given to a student, in keeping with the final part of their study at the school. See: Chapter 2 and Gelfand 1972, 99-130.
[338] Crainz 1995, 119 notes that there is a colour drawing accompanying the manuscript in the archives of the Royal Society. This was not published in the *Philosophical Transactions.*
[339] Baillie 1788, 352-363.
[340] Baillie 1789, 72.

indeed died from a disease) were unknown. However, prior to this point, Baillie provided a short scholium in the paper that discussed various theories on the production of unusual appearances of the ovaries. According to Baillie it was typically thought that such appearances were the result of "generation" gone awry—such appearances sometimes had "hair and teeth" that suggested such a conclusion. Yet Baillie's "case"—his own term—exhibited "many reasons why we should be led to believe, that the ovaria in women have some power within themselves of taking on a process which is imitative of generation, without any previous connection with a male".[341] The introduction to the paper then, suggested a case history for the cadaver. Though the bulk of the paper was concerned with tactile and visual information found at dissection ("I found the right ovarium converted into a substance, doughy to the touch, and about the size of a large hen's egg"), there was nevertheless a narrative to the "case".[342] Despite having scant information regarding the individuals history prior to dissection, Baillie worked to make the paper have a narrative that included a probable history. Baillie made the paper adhere to the conventions of the case history narrative genre.

The remainder of Baillie's papers in this period were given to the Society for the Improvement of Medical and Chirurgical Knowledge. Founded in 1782 by George Fordyce and John Hunter, it was a small, exclusive society that met monthly for medical discussion and dinner at Slaughter's Coffee House.[343] The society began keeping records in 1793 which show that initially the society was limited to nine members, though there was an option to raise the figure to twelve that was soon taken up.[344] These proceedings likely formalised the practices that the society had operated with prior to 1793. In that regard, the rules regarding the reading of papers were well-developed. As it was put in the society's proceedings, the "one great object of this Society" was the publication "of such papers as shall appear to the members conducive to the promoting of medical and chirurgical knowledge". Papers were to be first read at a meeting, then circulated amongst members. Subsequent meetings would reconsider the paper and the publishing of the paper was decided by an open vote. Members were encouraged to

[341] Ibid., 72.
[342] Ibid., 72-78.
[343] Coley 2001, 403-404; Newton Pitt 1896, 1273.
[344] The first members listed in the *Proceedings of a Society for the Improvement of Medical and Chirurgical Knowledge* were (in order of appearance): David Pitcairn, George Fordyce, William Lister, John Hunter (either Dr or Mr), BC Brodie, John Hunter (either Dr or Mr), Charles M Clarke, Matthew Baillie, Thoms[?] Leigh Thomas, Phl[?] Russell. At the first meeting in the records Gil Blane, John Clarke, and James Robertson were added. Later additions were: William Charles Wells, J. Meroin Nooth, P. Macgregor, and James Wilson. *Proceedings* 1793–1817, 4-6.

make suggestions "either to correct or improve it in point of fact, argument, or language".[345] At the society there were thus strong incentives to present one's work in a suitable manner.

Thus, in Baillie's papers published in the first set of the society's *Transactions for a Society for the Improvement of Medical and Chirurgical Knowledge* in 1793, there was again an emphasis on cases. Baillie's 1788 paper, on a 'Want of a Pericardium' followed a similar structure to his paper on the malformed ovary.[346] His 1790 paper 'Of a remarkable Deviation from the natural Structure in the urinary Bladder and Organs of Generation of a Male' described in detail both the patient's history, as well as his "monstrosity".[347] And his 1791 paper, 'A Case of Emphysema, not proceeding from local injury' was written on a case he had at St George's where he had seen the patient both alive and dead.[348]

But there were new expectations too. As well as writing in genre, Baillie had to fulfil the objectives of the society—to improve medical and chirurgical knowledge. In this regard, general statements regarding disease were clearly encouraged at the society. John Hunter, for example, began a paper 'On Introsusception' with the clear, general statement that: "Introsusception is a disease produced by the passing of one portion of an intestine into another, and it is commonly, I believe, from the upper passing into the lower part".[349] After making several more general statements regarding the disease, he then applied his general observations to a specific case of "A.B. aged nine months".[350] The younger Hunter discussed the patient's case and the post-mortem findings, and also provided a figure and an additional "Supplement to the paper" from Everard Home.[351] The result was an authoritative account of the disease that proceeded an illustrative case, which was further completed with an illustration and a section of further comments. Note the similarity in structure to the way in which anatomy was taught at the Great Windmill Street school—from the general to particular using examples.[352]

Baillie's 1789 paper 'Of uncommon Appearances of Disease in Blood-vessels' was written along similar lines to John Hunter's paper. Though the cases that concerned Baillie were "by no means common", he nevertheless saw them as providing wider lessons—

[345] Ibid., 4.
[346] Baillie 1793b, 91-102.
[347] Baillie 1793d, 189-201. There is no mention of St George's Hospital in this paper, which suggests that Baillie may have acquired the body through 'headhunting', in a similar manner to how John Hunter obtained Charles Byrne (the 'Irish Giant)'s body. See: Moore 2005, 71-100.
[348] Baillie 1793e, 202-211.
[349] Hunter, J. 1794, 103.
[350] Ibid., 103-108.
[351] Ibid., 108-118.
[352] See Chapter 2.

knowledge perhaps—regarding the body's regular functions, despite not necessarily being directly useful for practice. As he put it:

> It is of consequence to remark singular appearances of disease in the body, even if they should not obviously lead to any useful observations in practice; because they open a more extended view of the operations of the animal oeconomy, point out more clearly the resources of nature, and render the invention of the mind more generally fitted to assist, when her efforts would otherwise be ineffectual. It is in this point of view that I think the following remarks upon some uncommon appearances of disease in blood-vessels, may not altogether be unworthy of notice.[353]

Baillie then outlined various types of blood coagulation, beginning with the most common examples and gradually discussing more unusual examples. These were, in Baillie's terms, "the ordinary course of diseased operations"—actions of the diseased body that were predictable and had clearly understood diseased appearances related to them.[354] After outlining the general appearances, he discussed an unusual case where he considered that the coagulation had worked to remedy an aneurysm located in the carotid artery, linking his observation to other similar cases.[355] The key medical point was that this unusual appearance represented an ordinary function of the diseased body. That this resulted in individuals' carotid arteries becoming partially or entirely blocked without harming the patient ("it is not improbable a person might live without circulation through a part of the main trunks of both carotid arteries") led Baillie to the practical surgical recommendation that: "if it should become absolutely necessary in any chirurgical operation, they might be taken up by ligature". This would artificially mimic the body's natural response, on which: "Mr. Hunter, in his Lectures upon Aneurysm, has mentioned nearly the same opinion".[356]

At the Society for the Improvement of Medical and Chirurgical Knowledge then, Baillie was encouraged to produce and provide generalisations about disease. In this context they were applied to specific cases in order that further conclusions might be drawn, here on physiology and the best method of treatment. Such a practice bears the hallmarks of both William and John Hunter's work. The move from general to specific in discussion imitated William's teaching at the school, as did the focus on the visual and tactile information provided by cadavers.[357] Meanwhile, the emphasis on discerning the body's natural functions and trusting nature to

[353] Baillie 1793c, 119.
[354] Ibid., 119-121.
[355] Ibid., 121-125.
[356] Baillie 1793c, 124-125. The paper then continued by discussing 'obliteration of the vessels' and 'ossification of the vessels' along similar lines: Baillie 1793c, 125-135.
[357] See Chapter 2.

produce its own cures was very much in keeping with John's focus on the 'animal oeconomy'.[358] Baillie's own work was therefore shaped but not dictated by his uncles, just as considerations of genre gave a standardised shape to the presentation of his observations that was flexible enough to allow him to focus on his conception of morbid anatomy.

These complementary interests and goals in writing on disease solidified around the use of images in Baillie's papers. He produced illustrations for all of the six papers he published in the period 1788–1793. Though no illustration was published to accompany his two papers in the *Philosophical Transactions*, the colour drawing that accompanied his paper on the transposition of the viscera remains in the Royal Society archive, whilst an illustration of the unusual ovary was published in his *A series of engravings*.[359] All four of his papers in *Transactions for a Society for the Improvement of Medical and Chirurgical Knowledge* were accompanied by illustrations. Figure 5, from Baillie's paper 'Of uncommon Appearances of Disease in the Blood Vessels' is an instructive example. It is the second of two plates that accompanied the paper. These plates illustrated each of the cases discussed in the paper. Figure 5 shows two illustrations on one plate that demonstrated various kinds of morbid appearance of the vessels. The small illustration showed a part of the inferior vena cava and "Represents the size, shape and irregularity of the ossified part." The larger illustration is clearly much more complex. It demonstrated a series of diseased appearances of the vessels around the spinal column. A large portion of the spine was kept intact to enable both orientation and support for the vessels. Another orientating feature in the illustration was also point "II. The two kidneys dried and shrunk". Meanwhile, point C showed the vena cava inferior ossified (which the smaller illustration showed more clearly), point D was the "obliterated portion of the vein", E was "Left emulgent vein enlarged", F the "vena azygos considerably enlarged", G an "uncommon vena azygos of the left side, very much enlarged and tortuous", and H enlarged and tortuous "Veins of communication between the left iliac vein and left vena azygos".[360] The plate therefore comprehensively demonstrated the diseased appearances present in the preparation, not only by producing a large illustration, but also by presenting an additional

[358] For example: Hunter, J. 1794, 2-3.
[359] Crainz 1995, 119-120. Baillie 1799–1803, 199-201. It is unclear whether an ovarium illustration was made for publication in the *Philosophical Transactions*, but it is unlikely given that there is no record of an illustration having been submitted. That an illustration was made specifically for *A Series of Engravings* suggests that Baillie did not produce an illustration for the *Philosophical Transactions* based on the earlier rejection of the transposition of the viscera illustration.
[360] Baillie 1793b, 137.

view of the ossification of the vena cava inferior in a separate illustration to clarify its appearance.

Figure 5: Illustration of spinal cord with vessels attached. Matthew Baillie, Plate V, *Transactions for a Society for the Improvement of Medical and Chirurgical Knowledge,* volume 1, 1793b.

In doing so, Baillie employed representational strategies advocated by both of his uncles. Most obviously, the illustrations were very large and indeed near life-size as William Hunter advocated.[361] The illustration also represented a preparation that was housed in a museum collection: both William and John Hunter illustrated parts of their collection for posterity, creating a 'paper museum' alongside their physical ones.[362] Furthermore, the illustration of this singularity was fully in keeping with the usual way of representing monstrosities in this period, which both Hunters adhered to where necessary. But at the same time, the illustrations represented Baillie's arguments and observations, which he linked to his access and use of the extant collections of his uncles and himself. In Figure 5's case: "Both of these drawings were taken from a dried preparation long after it was made".[363] Baillie thus

[361] Hunter 1774, preface; Berkowitz 2015b, 174-179; Daston and Galison 2007, 75-77.
[362] Both archives related to the Hunter brothers' work contain a large number of illustrations of preparations in the museum. On William Hunter's collection of illustrations see Alicia Hughes's forthcoming PhD thesis. On John Hunter's museum see: Chaplin 2009. On paper museums see: Rudwick 2000, 51-68.
[363] Baillie 1793b, 137.

incorporated and, more significantly, appropriated epistemic standards and expectations for his own purposes. Whilst his work was recognisably influenced by his uncles, it was presented in order to appeal to a wide audience. Baillie used genre for his own ends, and in making *Morbid Anatomy* he would do so again.

3.2: Baillie's *Morbid Anatomy of Some of the Most Important Parts of the Human Body* (1793)

Baillie's *Morbid Anatomy* was a work of anatomy on the subject of disease. This was a different genre—a different kind of work—to typical works on disease that included post-mortem examination, which were commonly embodied in case histories. Through publishing a work of anatomy on the subject of disease, Baillie emphasised the different nature of his book from prior work on disease. In his preface, Baillie was explicit that the work was not one of cases. It was not like the cases found in periodicals (as he had previously published), and nor was it like the cases found in works that collated and compared cases like Morgagni's *De sedibus*:

> Any works explaining morbid structure which I have seen, are very different in their plan from the present: they either consist of *cases* containing an account of diseases and dissections collected together in periodical publications, without any natural connection among each other; or consist of very large collections of *cases*, arranged according to some order.[364]

Instead Baillie's work was squarely focused on "the changes of structure arising from morbid actions".[365] Like the relationship that Hunter advocated between anatomy and physiology, Baillie saw morbid anatomy as the basis for investigation into morbid action. He therefore focused on morbid anatomy with a view to laying the groundwork for a better understanding of morbid action. To facilitate this, Baillie removed patient narratives about disease from the picture, and instead focused on the workings of the diseased body. He did not remove all such narrative aspects from the work, however, as aspects of cases might provide information important to the understanding of morbid anatomy or morbid action on occasion. In this section I argue that Baillie facilitated the understanding of his work as anatomical by publishing it as a work of anatomy, in a genre that I term the 'instructional anatomical description' genre. That is, the kind of work that *Morbid Anatomy* was, was an anatomy book that prioritised anatomical modes of thinking about disease in contrast with previous case history narratives. I demonstrate this through comparing *Morbid Anatomy* with Hunter's *An Anatomical Description of the*

[364] Baillie 1793a, vi-vii emphasis mine.
[365] Ibid., i.

Human Gravid Uterus (1794), a text-only work that shared a number of features with Baillie's work. Both aimed to instruct through descriptions of anatomy and employed similar formats and organisation. Their descriptions emphasised the wide applicability of their findings to other, similar bodies, and clearly flagged points of theoretical speculation for readers. Furthermore, their descriptions focused on orientating the reader, making comparisons that would clarify information, and then go into further detail. Baillie thus presented his work as anatomical by using features of the instructional anatomical description genre. However, at times in his work, Baillie could not apply this presentation consistently. Due to the multifaceted and complex nature of disease combined with his own desire to provide a useful work to his contemporaries in the manner of his lectures, he sometimes included cases. For his contemporaries, this was a point of concern that engendered criticism, as we will see in the next section.

In *Morbid Anatomy* Baillie articulated a very different vision as to how the study of disease ought to be undertaken, which was related to his view on the relation between the findings made at post-mortem and disease. As I discussed in Chapter 1, Baillie saw morbid anatomy as the best way of understanding morbid action, just as anatomy was the best way to understand physiology for Hunter. That is, the actions of disease were best interpreted through the examination and investigation of lesions found in the body. Just as anatomical findings were the basis for inferring regular function, so morbid anatomy was the basis for inferring abnormal function. As Baillie put it: "as we shall become acquainted with the changes produced in the structure of parts from diseased actions, we shall be more likely to make some progress towards a knowledge of the actions themselves".[366]

This view had two important corollaries for Baillie that shaped *Morbid Anatomy*. First, it focused his work primarily on the study of morbid anatomy. Though morbid action was the ultimate goal, the study of morbid anatomy had, in Baillie's view, been inadequate. Spread across individual papers in periodicals, or—as in "the stupendous work of Morgagni"—unduly concerned with comprehensive description of all the lesions found in the body rather than relevant description, the study of the lesions found at post-mortem was in a confused state:

> In some of these periodical works, the diseased structure has been frequently explained with a sufficient degree of accuracy, but in all the larger works it has been often described too generally. The descriptions too of the principal diseased appearances have

[366] Ibid., ii.

> been sometimes obscured, by taking notice of smaller collateral circumstances, which had no connection with them or the diseases from whence they arose.[367]

Thus, Baillie's work proposed "to give no cases; but simply an account of the morbid changes of structure which take place in the thoracic and abdominal viscera, in the organs of generation in both sexes, and in the brain", which he advocated as taking advantage of his "more than then ordinary" opportunity to examine morbid structure.[368] In doing so, Baillie attempted to avoid the inherent pitfalls of post-mortem descriptions in cases being too specific or diffuse. His focus on morbid anatomy aimed at building the groundwork for better understanding of morbid action.

The second consequence that Baillie's views on the study of disease had for his book was to largely remove the patient from the picture.[369] Specifically, the patient narrative aspect of cases, incorporating symptoms, was not consistently useful for the description and analysis of morbid anatomy, as it was not typically possible to relate internal changes with aspects of the patient narrative with any degree of certainty. But Baillie did include clinical dimensions in *Morbid Anatomy* where relevant—Baillie famously suggested a link between alcoholism and liver disease for example.[370] Rather, such inclusions were piecemeal and dependent on what light those observations shed on morbid anatomy and morbid action. However, a certain kind of narrative was of interest to Baillie. Morbid action implied temporally located change in the body's structures caused by disease. As I discuss below, Baillie therefore discussed aspects of morbid anatomy specifically with a view to suggesting kinds of action as cause of specific appearances. Through being removed from the patient encounter, such actions effectively occurred in a general morbid body, just as anatomy and physiology was concerned with the body and its actions in general terms. This had a number of clear advantages for the study of disease for Baillie. The focus on the evidence of the body instead of on the practice of the physician (as in case history narratives) would mean that knowledge of diseases that altered parts that were "but little, or not at all known" would improve, and that unsubstantiated "theories taken up hastily about diseases" would be exploded.[371] Through this anatomical

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[367] Ibid., vii.
[368] On his opportunities to observe morbid structure Baillie stated: "Dr. Hunter's collection contains a very large number of preparations exhibiting morbid appearances, which I can have recourse to at any time for examination. Being physician to a large hospital, and engaged in teaching anatomy, I have also very frequent opportunities of examining diseases in dead bodies" Ibid., viii-ix.
[369] On the removal of the 'sick-man' from medical cosmology in this period see: Jewson 1976, 225-244.
[370] Bertoloni Meli 2017, 93-94.
[371] This mirrored Hunter's comments on the relation between anatomy and physiology that I examined in Chapter 1. Baillie 1793a, iii-iv.

focus, not only would purely theoretical accounts of disease be avoided, but better accounts of disease would be made, which in turn would help the understanding of symptoms, and improved therapeutics would gradually come to be within reach.

Therefore, Baillie clearly conceived of his work on morbid anatomy in anatomical terms. Yet this could not be entirely removed from individual cases. On occasion, clinical aspects were relevant to understanding morbid anatomy or morbid action, which required Baillie still to deal with singular cases and the contingencies and messiness of their bodies in *Morbid Anatomy.* As we saw in the previous section, Baillie was adept at writing accounts of individual findings of morbid anatomy into cases, of fitting his work into a genre and conforming to its culturally generated expectations. But in *Morbid Anatomy* he was attempting to present an anatomical study of disease. This had the aim of producing generalised descriptions of diseased structure in the manner that anatomical description generalised the findings of the regular body into a universal account of the human body. In order to emphasise that the work of morbid anatomy was anatomical, I argue that Baillie wrote *Morbid Anatomy* in a different genre to that of case histories, that of the instructional anatomical description genre. That is, he wrote a work concerned with producing instructional—in the pedagogical sense of the term—definitions or descriptions of anatomy or anatomical phenomena. In producing a work of anatomy on the subject of disease, Baillie took on aspects of the instructional anatomical description genre in order to clarify the methods of morbid anatomy (see Chapter 2), and to ensure that the work was viewed by his contemporaries as a work of anatomy, and morbid anatomy as an anatomical approach to the study of disease.

To do this, Baillie specifically presented *Morbid Anatomy* as a descriptive work of anatomy in the manner of Hunter's *An Anatomical Description of the Human Gravid Uterus* (1794). Published, as Baillie's work was, by Joseph Johnson and George Nichol, the work had been intended by Hunter to properly describe the anatomy of the gravid uterus, as his earlier publication, *The Anatomy of the Human Gravid Uterus, Exhibited in Figures* (1774), had 'merely explained' the plates.[372] Hunter did not publish the work in his own lifetime, though he had intended on doing so. Baillie inherited the manuscript, but did not immediately publish it because it was unfinished and explained that at that early point in his career he was unable to judge "whether the Manuscript was in a state fit for publication or not". On revisiting it in

[372] Baillie in Hunter 1794, viii. Baillie also described the publication as rendering the *Gravid Uterus* more 'complete', a description he would later apply to his own illustrations of morbid anatomy: Baillie 1799–1803.

the early 1790s, he realised that it needed little correction, so the work appeared in print largely has Hunter had left it.[373]

The choice of Johnson and Nicol as publishers for both works emphasises the importance of personal relationships in the publication of Baillie's unusual work. Johnson was a highly active medical publisher, whose shop was located on a major thoroughfare between two teaching hospitals—St Bartholomew's and Guy's Hospital. In addition, Johnson's political position of rational dissent had brought him, and his publishing business, into contact with a wider scientific community that included John Hunter.[374] On the other hand, Nicol published fewer scientific and medical works than Johnson, and cultivated a gentlemanly status, being bookseller to the King from 1781 to 1820.[375] The two worked together on very few medical works, but appear to have come to an agreement to publish works derived from the Great Windmill Street school together at least in part so they were not in competition for those works. Johnson had published John Hunter's *The Natural History of the Human Teeth* in 1771, whilst Nicol had helped publish Hunter's *Gravid Uterus* in 1774. After that point they were both involved in publishing further works by both Hunters, Cruikshank, Baillie, and Everard Home.[376] Thus, by publishing with Johnson and Nicol, Baillie made use of an already established working relationship that had previously worked to publish work from the Great Windmill Street school. For other publishers, Baillie's work may have seemed too risky—it was simply unheard of to publish a work of anatomy on the subject of disease—but Johnson and Nicol had long benefitted from working with the anatomists at Great Windmill Street.

Both Hunter's and Baillie's books were text-only works on anatomy designed to accurately describe their subject.[377] These subjects were different however: Hunter's work only described regular anatomy while Baillie's focus was on disease. As Baillie explained in *Morbid Anatomy*: "The object of this work is to explain more minutely than has hitherto been done, the changes in structure arising from morbid actions in some of the most important parts of the human body", and as Baillie put it in Hunter's *An Anatomical Description*: "An accurate Anatomical Description of the Human Gravid Uterus and its Contents, has not hitherto been

[373] Baillie in Hunter 1794, ix.
[374] Braithwaite 2003, 60-61. See also: Tyson 1979; Bugg (ed.) 2016; Hall 2013.
[375] Painting 2008.
[376] I have made extensive searches on Johnson and Nicol's publishing on *Eighteenth-Century Collections Online*. It appears that together they published 13 titles on medicine before 1800, almost all of which were authored by members of the Great Windmill Street school.
[377] Text-only works of anatomy were common in this period as they were cheap compared to illustrated anatomy works. Baillie's book was priced at six shillings. See the introduction to this thesis.

published in this, nor I believe in any other country".[378] Instruction was thus a central aim for both works, delivered through accurate descriptions of anatomy.

The format of the two works was also similar. Baillie emphasised that he organised *Morbid Anatomy* like a work of anatomy: "a local arrangement, very much in the same manner as if we were describing natural structure".[379] The work was therefore divided into chapters concerned with the main anatomical subjects ('Diseased Appearances of the Pericardium', 'Diseased Appearances of the Heart' and so on), just as Hunter's work had been ('Of the Size of the Uterus', 'Of the Contents of the Pregnant Uterus', 'Of the Membranes' and so on). Then chapters were further subdivided into specific parts. In Baillie's work they were divided into specific appearances of diseased structures ('Inflammation of the Pericardium – Adhesions of the Pericardium to the Heart – Dropsy of the Pericardium' and so on), whilst in Hunter's, into specific parts ('Amnion', 'Chorion', 'Decidua' and so on for the chapter on membranes).[380]

As well as rhetorically and organisationally aligning his work with that of the instructional anatomical description genre, Baillie employed similar techniques of description. The descriptions had three key features that I will briefly outline in turn. First, they were generalised descriptions, though often based on individual preparations. Secondly, they tended to eschew theorising over physiology or morbid action, but where such speculations were entertained this was clearly flagged for the reader. Thirdly, the descriptions focused on enabling the reader to recognise such structures in their own work, with a concomitant emphasis on orientation, comparison, and detail in the descriptions of anatomy.

Baillie and Hunter based their general descriptions of anatomy on a combination of their knowledge of the subject, and individual preparations that demonstrated specific points, emphasising the applicability of their points to anatomy and morbid anatomy respectively. As I demonstrated in Chapter 2, the combination of objects in the collections Baillie had access to, alongside their catalogues, formed the material basis for his claims as well as shaping his descriptions. For example, in Baillie's collection the preparation "4.O.5" in "Morbid Anatomy of the Heart and its Vessels" specifically showed: "A considerable portion of a heart, the surface of which [the pericardium] is covered by a thick layer of coagulable lymph resembling lace".[381] In *Morbid Anatomy* the comparison with lace, with its emphasis on both visual

[378] Baillie 1793a, i, viii; Baillie in Hunter 1794, vii.
[379] Baillie 1793a, viii.
[380] Baillie 1793a, xiii; Hunter 1794, xi-xii.
[381] Baillie *A Catalogue of the Preparations of Anatomical and Pathological Specimens in the Museum of the Royal College of Physicians, London* c.1790–1867.

appearance and texture, was also used, but was now generalised to describe such appearances and suggest morbid action, linking the appearance to action within the body: "Upon its inner surface [of the pericardium], this matter very frequently throws out little irregular laminated projections, giving the appearance of a lace work".[382] The veracity of the general claim and the claim of morbid action rested on Baillie's "very frequent opportunities of examining diseases in dead bodies".[383] Similarly in Hunter's work, the description of the size of the human gravid uterus rested on individual preparations—represented by his earlier published illustrations—and his authority in determining that the size represented there was "common": "The common size of the pregnant uterus may be understood by casting the eye over the first, second, fourth, eleventh, and thirteenth plates".[384] Both works thus presented their descriptions as being applicable to similar anatomical appearances.

Both books also largely avoided theorising upon the actions of the body in relation to their anatomical findings. In this regard, Hunter had been clear in his lecturing that he regarded ungrounded theorising in physiology as sophistic and a source of error.[385] Being clear on anatomical findings was therefore of paramount importance; supposition was largely avoided in their works. But there were instances in both works where the authors occasionally suggested such conclusions based on the anatomical evidence. They did so while taking care to emphasise the nature of the supposition they were making. For example, Baillie suggested that the vascularity of coagulable lymph that surrounded the inflamed pericardium was a "circumstance" that "becomes a very convincing proof of this extravasated matter possessing a living principle". That is, he suggested that it was functioning in the body despite being an irregular appearance, and was therefore a natural response of the body to disease, and linked this suggestion to John Hunter's work.[386] The phrase Baillie used flagged the conclusion as a speculation at the same time that it condoned it. Similarly, Hunter suggested that the "peculiarity" of human uteri in an unimpregnated state having "two lateral cavities, so as to resemble the two horns of the uterus in a quadruped" might "*perhaps* explain the unequal extension of the two sides, right and left, in some instances of pregnancy".[387] Again, the hedged

[382] Baillie 1793a, 3.
[383] Ibid., ix.
[384] Hunter 1794, 1-2. The illustrations represented individual dissections of the human gravid uterus and can thus be understood as preservations in the manner of preparations. Indeed, several preparations and plaster casts were made from these same dissections. See: MacDonald 2015, 97-111.
[385] Hunter 1784, 94-97; Cunningham 2010, 139.
[386] Baillie 1793a, 3.
[387] Hunter 1794, 5 emphasis mine.

nature of the phrase demonstrated to the reader the speculative nature of theorising physiological action.

Central to each work was, of course, the business of describing the anatomical structures in question. The purpose of this was primarily to enable the reader to recognise those structures within a cadaver. Both works therefore focused on orientating the reader in the body before detailing the specific features of the body through comparison with familiar objects alongside widening potential recognition of the structure by adding further detail. In Baillie's work, orientation focused on where the structure in question was likely to be found, for example: "In opening dead bodies, adhesions of the pericardium to the heart, are not uncommonly found. The adhesion is sometimes at different spots; at other times is extended over the whole surface". Then, in order to recognise the specific type of diseased appearance, comparisons with other more familiar things were made, such as: "When it is a thin membrane, it resembles very much, the common cellular membrane of the body". Further details were then discussed, widening the opportunities for recognition by the reader through increasing the number of ways in which the structure had been discussed. In this case, "the adhesion is in both cases capable of being rendered vascular from injection".[388] The description therefore focused on contextualising the structure for the reader. Baillie assumed a knowledge of anatomy from the reader, and also that they would have familiarity with the art of injecting vessels with various substances in line with how anatomy was taught at the Great Windmill Street school. Hunter's work described anatomy in the same way. For example, it orientated the reader ("The navel string is a cord made of three large vessels twisted together, which at one end is fixed to the child's navel, and at the other to the placenta"), made comparisons ("Sometimes they are uniformly and closely twisted, like a rope, in their whole course"), and gave further details ("the twisting of the navel string has been in the same direction").[389] Though not an exhaustive list of the methods by which Baillie and Hunter described anatomy, it is clear that they shared methods of description despite their different subjects: Baillie's *Morbid Anatomy* was a work in the instructional anatomical description genre.

But it is important to note, too, that even as the work was presented as anatomical, the concern with disease sometimes worked against its presentation as such. For example, in the opening of "Diseased Appearances of the Pericardium" Baillie outlined what patients were typically most affected by this appearance (mature adults rather than children or geriatrics).

[388] Baillie 1793a, 5-6.
[389] Hunter 1794, 32-34.

Throughout the work, Baillie also gave cases where he deemed it necessary.[390] In doing so, Baillie was comprehensive in his discussion of diseased appearances and was making his work as useful as possible, just as he was in his lectures. William Clift's notes of Baillie's lectures show that he made three separate headings regarding inflammation of the pericardium: "Sympt[oms]", "Treatment", and "Diseased appearances after death". Whilst the category on symptoms had no entry, Clift did make notes on treatments. Meanwhile, the heading with the most information under it by far was on morbid appearances, which was clearly the main subject of the lecture.[391] Nevertheless, these inclusions were points of contingency in an otherwise generalised account of morbid anatomy. Including these points was necessary for Baillie to be comprehensive and produce a useful work, but demonstrates that disease was not always applicable in a consistent way to anatomical methods. This point was reflected in the wider concerns of Baillie contemporaries regarding the work, some of whom were critical regarding the project and its author.

3.3: Criticism of *Morbid Anatomy* and Baillie's Reaction, 1793–1797

By publishing a work of disease in the instructional anatomical description genre and outlining his own vision of how the study of disease ought to be undertaken, Baillie challenged *what kind of work* typically investigated disease. As I showed in Chapter 1, the writing of case history narratives was the typical approach. This was intertwined with the practice of the physician attending a patient. Physicians noted presenting symptoms, treatments used, the course of the disease, and, if necessary, post-mortem findings, before publishing their account in order to work towards better practice. Baillie had presented his work in such a manner in his early papers. By contrast, *Morbid Anatomy* removed the narrative element of the patient encounter and focused solely on morbid anatomy, describing diseased appearances in the manner of an anatomy book. Baillie's work was aimed at providing generalised knowledge of morbid anatomy to the reader in a manner analogous to the teaching of anatomy at the Great Windmill Street school. This was not necessarily prescriptive—Baillie did value Morgagni's work with cases for example—but it was certainly aimed at improving accounts of morbid structure at the very least.

[390] Baillie 1793a, 1, 265-268.
[391] Clift *Clift's Notes from Various Lectures*, c.1799.

In this section, I examine the criticism that Baillie's work received from contemporaries in relation to his alternative plan for the study of disease, and its execution. In Britain, reviewers struggled to see the practical benefit of the work, as it strayed from Morgagni's example. Abroad, Samuel Thomas von Sömmering appreciated Baillie's plan, but thought it could be better executed and so produced the first translation of his work, into German. Baillie responded to this criticism when updating the work for its second edition. However, I argue that in doing so, he worked to maintain his original intentions for the work, even as he made concessions to his critics. In terms of concessions, the second edition included symptoms, which British reviewers had asked for, as well as incorporating a number of Sömmering's changes. However, Baillie's use of Sömmering was sparing. Though he did use his observations and additions, Baillie also ignored many of his comments, and ensured that his own view of diseased structure was prioritised throughout, including by adding new material that he had worked on in the intervening years between publications. Regarding symptoms, Baillie placed them after the descriptions of morbid anatomy, disrupting the typical pattern of case history narratives, and promoting his own vision of how the study of disease ought to be undertaken—from findings at dissection through morbid action to symptoms and therapeutics. In that regard, Baillie also ensured that there was little narrative element to his descriptions of symptoms, further distancing his work from the case history narrative genre, even as he included more aspects of it.

Initial reviews in Britain of *Morbid Anatomy* were generally positive with regard to how successful Baillie had been in fulfilling his explicit scope—to describe the changes in structure resulting from disease on the most important parts of the human body—but critical of his practice. Reviews noted that the subject of Baillie's work was a pertinent and novel one that deserved attention, for example:

> It is somewhat extraordinary, that the morbid structure of different parts of the human body should have been almost totally overlooked and neglected, while the knowledge of anatomy was making such rapid advance to a state of perfection. Such, however, is the fact: we must therefore feel much obligation to Dr. B. for drawing the attention of the faculty to this important point.[392]

And the work was viewed as well-executed in that regard, as this example from *Monthly Review* shows:

[392] *Analytical review* 1793, 397.

> the utility of the design cannot be questioned; and, to those who are acquainted with the author's peculiar advantages, as well as with his talents for improving them, it will as little be a matter of doubt that the execution of it will be correspondent. Extensive observation, joined to great clearness and accuracy of description, without any impertinent mixture of hypothetical matter, characterizes the performance.[393]

Reviews identified the work as especially useful for students: "[it] must be of great utility to the young practitioner".[394] However, there was disagreement over exactly how useful the book would be beyond aiding students. The *Analytical Review* highlighted that whilst Baillie's work contained very valuable information, quite what the value was of confining the work only to descriptions of morbid anatomy was unclear:

> it only remains for us to observe, that it seems to be principally useful as containing a great number of valuable and curious facts. The practical reflections and observations are, perhaps, not quite so numerous or important as the nature of the undertaking had led us to expect; […] – It is very difficult at first to fix upon the best plan for the execution of such a work as the present. How far, therefore, the arrangement followed by our author may be considered as proper and satisfactory, and whether a simple and distinct narration of diseased appearances be only necessary, we shall leave to the decision of the medical reader.[395]

The *Analytical Review* went on to question Baillie's quality speculating that: "the execution of a work of this kind, more, probably, depends upon industry than genius".[396]

The issue was that it was not obvious how descriptions of morbid anatomy would be practically useful, despite the explanation that Baillie provided in his preface. One reviewer for the *Critical Review* summarised what it was that they, at least, wished to see: symptoms included and correlated with morbid anatomy findings in order that the publication be more in keeping with Morgagni's *De sedibus* which had done so thirty years earlier:

> As to the plan of this work, we are sorry to remark, that we think Dr. Baillie has done wrong in departing from the footsteps of Morgagni. Dr. Baillie gives a general history of the morbid changes taking place in the body; Morgagni relates particular instances, and after having detailed the symptoms which immediately preceded the death of a patient, presents us with the appearances exhibited on dissection. By thus pointing out and ascertaining the connexion between certain symptoms, and certain deviations from natural structure, he affords the most effectual assistance to the physician, and enables him to judge of the real state of the morbid body, previous to death.[397]

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[393] Griffiths (ed.) 1794, 406.
[394] *Analytical Review* 1793, 404.
[395] Ibid., 404.
[396] Ibid., 397.
[397] This description distorts Morgagni's work by ignoring the fact that Morgagni's discourse focused on groups of cases (see Chapter 1). Thanks to Adrian Wilson for pointing this out to me. Smollett (ed.) 1794, 375.

Thus, whilst Baillie's work was immediately seen as useful in terms of teaching students about post-mortem findings, its use for the physician's practice was unclear. Because it was not like Morgagni's *De sedibus*, the work's utility was open to question. In presenting the work in this manner, this genre, Baillie had, in the *Critical Review's* terms, *done wrong.* This criticism all stemmed from not following Morgagni's example and writing in case histories.

But outside of London other readers were more sympathetic. The Prussian anatomist and physiologist Samuel Thomas von Sömmering, who had likely attended both Hunter brother's lectures during a two-month stay in London during 1778, was effusive in his praise for Baillie's work.[398] Indeed, Sömmering was so impressed with *Morbid Anatomy* that he soon produced a full translation into German of Baillie's work published in 1794. In his preface Sömmering discussed exactly why *Morbid Anatomy* was worthy of such speedy translation. First, it contained excellent descriptions of morbid anatomy and judgements based on them: "The wealth of facts within this work, collectively fashioned directly from nature itself—these exquisite, new observations—and judgements formulated with the utmost care and modesty".[399] Sömmering also viewed Baillie's model of studying disease as appropriate for his own needs: "This meanwhile gave me the opportunity […] to align my own pathological observations with an extant system".[400] He saw Baillie's work as better placed to discuss findings made in the diseased cadaver compared to the examinations that generally took place as part of the practice of pursuing case histories:

> autopsies, whilst nowadays far from infrequent, have yet so infrequently contributed to shedding light on pathology. They know neither the What nor the How of that which they are supposedly looking for; they dissect the cadaver in the accustomed fashion of their fraternity, and then wonder why they encounter nothing special.[401]

Thus, Baillie's work was worthy of both praise and emulation:

> Mr Baillie's […] shows altogether the purest love of truth—altogether more intelligent, clearer understanding, free of prejudice—altogether one recognises a general overview of the morbid changes of which the parts of our body are capable.— Here, attentive, thoughtful, practical doctors will surely find facts which will bring them to the actual basis and true cause of many of the symptoms they observe; perhaps to receive long

[398] Sömmering also spent five months in Edinburgh with Alexander Monro secundus. See: Naragon 2010.
[399] I am indebted to Ian Avery who completed the translation of Sömmering's edition of Baillie for me. My thanks to him and Caz Avery. Sömmering 1794, 11-12.
[400] Ibid., 12.
[401] Ibid., 16.

> awaited explanations. – Others, however, will balk at facts which will accord badly with some famous theories; consequently they serve as a rebuttal to those theories.[402]

However, this praise for Baillie's plan did not mean that Sömmering was completely happy with *Morbid Anatomy* as he found it. Indeed, his translation made significant changes to Baillie's work, mostly through the addition of new material. He added further clarifications, new descriptive features, and his own observations—including of different diseased appearances—to Baillie's work, with the intention of making it more useful to the practitioner. In the pursuit of clarity, he also removed some descriptions (for example, the description of the pericardium as "like a bag"). Sömmering also added many more references than Baillie had, including to works where good illustrations of the diseased appearance in question were, most from German speaking lands. Thus, works by Johann Friedrich Blumenbach, (likely) Christoph Gottlieb Büttner, Johann Christoph Pohl, Christian Gottlieb Selle (all Prussia/Germany), Eduard Sandifort (Netherlands), Théophile Bonet, Albrecht von Haller (both Switzerland), Georg Heuermann (Denmark), Alexander Munro secundus (Scotland), Joseph Lieutaud (France), as well as his own were cited alongside illustrations by Johann Gottlieb Walter (Prussia/Germany), Sandifort, and Büttner.[403] Baillie's work was thus encouraged into conversation with European sources. The sources that Sömmering referenced appear to be largely case histories that he viewed as being particularly useful for their post-mortem content, perhaps as a way of including those descriptions in periodicals that were sufficiently judicious as Baillie had described in his preface.[404] In short, though Sömmering—unlike the British reviewers—was impressed with the plan of the work, he wished to improve its execution where the British reviewers had wished the plan changed though they appreciated the execution of it.

Baillie's second edition of *Morbid Anatomy* addressed the concerns both of the British reviewers and of Sömmering, but did so in a way that maintained Baillie's original purpose for the publication as well as its execution. The work roughly doubled in size, and so saw significant additions, some of which had been suggested or prompted by Sömmering's translation. However, the main addition to the work was the inclusion of descriptions of symptoms that attended the appearances discussed. This addition was designed to appease the British reviewers by making it possible to use the work more effectively in the writing of case histories. In making these changes, Baillie might be thought of as having simply acquiesced to

[402] Ibid., 17-18.
[403] Ibid., 1-11.
[404] Sömmering appears to have been quite generally interested in anatomical difference, producing what he described as the first anatomical illustrations of the female skeleton, and writing a book on the differences between races. See: Schiebinger 1986, 42-82; Schiebinger 1990, 387-405.

the demands of others who saw his plan—writing a work on disease in the instructional anatomical description genre—as inappropriate for the subject. But this was not simply the case. Baillie maintained the main structure of his work by including symptoms only at the end of chapters, thereby disrupting the narrative needs of case histories, and maintaining the integrity of his alternative method within *Morbid Anatomy*, where the understanding of symptoms came after that of morbid appearance.[405]

In the new preface to the second edition Baillie was clear that it remained principally based on his own observations, but had been influenced by Sömmering's translation: "The additions are principally derived from what I have remarked myself; but they are also taken from the observations of others, and more especially from those of Dr. Soemmering" whom Baillie described as adding "many new Cases, and copious Notes" to his work.[406] The pointed, and somewhat inaccurate, description of much of Sömmering's work being the addition of cases was, however, justification for Baillie's comment that: "I might have derived much more assistance from the valuable labours of Professor Soemmering, but many of the additions which he has made do not strictly fall within it".[407] Sömmering did add cases to the work, but primarily in the form of citations to the literature. Nevertheless, this addition was indeed outside of Baillie's initial intentions, as the previous section demonstrated. Whatever the reason for Baillie's summary, Sömmering's translation was an important consideration in Baillie's attempts to improve the content of the work, but not the sole motivating factor.

A brief survey of the main changes that Baillie made to the first chapter, "Diseases of the Pericardium", serves to make the point. In his translation, Sömmering made his own changes to make the descriptions of morbid anatomy more intelligible to the reader. For example, he deleted the description of the pericardium as "like a bag" wherever it appeared in Baillie's chapter, and added further clarifying comments. For example, to Baillie's description of the layer of coagulable lymph that sometimes formed after inflammation of the pericardium as "thick as a half crown", Sömmering added an alternative measurement, "a Paris line". Sömmering also included his own descriptions where he felt appropriate (Sömmering described coagulable lymph as "cellulose-like" for instance), all with the intention of making the work clearer for the reader.[408] Baillie ignored all of these changes in writing his second

[405] From a preliminary analysis, it appears that the descriptions of symptoms were similarly written to be outside of the narrative of case histories, and intended to be linked to specific diseased findings. Baillie 1797.
[406] Ibid., xiii-xiv.
[407] Ibid., xiv.
[408] Sömmering 1794, 2-3.

edition—they were not his observations after all, and some of the clarifications were of insufficient use for him to include.

However, where Sömmering had discussed the intellectual content of the work, Baillie was more responsive. Two examples serve to show how Baillie used Sömmering's translation to improve his second edition. First, in discussing the possibility of the "extravasated matter [coagulable lymph lining the pericardium] possessing a living principle", Sömmering assigned this morbid action to the already existing vessels moving as a result of the inflammation: "Why should one be unable to accept this? The injection indeed shows clearly enough that the vessels of the pericardium are lengthened and spread, and it is precisely because the blood vessels are extended into the coagulable lymph that the same is given life".[409] Hence, Sömmering assigned the "living principle" of the matter to the movement of already extant vessels. In his second edition, Baillie clarified his position on this in response to Sömmering, the vessels were new and demonstrated the matter possessed a living principle: "These newly formed vessels become a very convincing proof of this extravasated matter possessing a living principle; for one cannot imagine that blood vessels would shoot into, and form a number of new branches in, a substance which is dead".[410] Baillie therefore used Sömmering's work as a guide to improving the clarity of his own.

Second, Baillie also added content to his second edition that Sömmering had added to Baillie's first. For example, Baillie included a new diseased appearance in the same chapter, "Pericardium found wanting". The description was not included in his first edition, despite Baillie having read a paper on the subject to the Medical and Chirurgical Society in 1788 with it being published in 1793.[411] His later decision to include the appearance mirrored Sömmering's inclusion of the appearance, for which he gave references to Haller and Dinkler. Baillie did not imitate Sömmering's content on the matter, once again preferring his own observations, but was surely prompted into the statement that "A few instances have occurred, in which the pericardium has been wanting, from a defect in the original formation" due to Sömmering.[412] The translation was therefore a prompt for Baillie to include new content as well as clarify previously published content.

[409] Baillie 1793a, 3. Sömmering 1794, 3.
[410] Baillie 1797, 3.
[411] Baillie 1793b, 91-102.
[412] Sömmering 1794, 11n.5. Baillie 1797, 13.

Baillie also attempted to improve his work based on his further practice in the years between the two publications. Some of these changes were clarifications—for example, Baillie added proper subtitles for "Scrofulous Tumours in Pericardium" and "The Pericardium almost dry" in the body of the text, where previously they had only appeared in the contents of the work.[413] But others were new observations. An example, in the section "The Pericardium cartilaginous, and bony" was of a wholly new "instance of the latter sort" which Baillie originated from his own continued practice as a morbid anatomist.[414] The work remained based on Baillie's observations.

And the work remained a work in the instructional anatomical description genre despite the addition of symptoms, the largest addition in terms of quantity. Adding symptoms was certainly in response to the criticism that Baillie received in moving away from cases, and as such this addition was a partial concession to critics who wished for cases from Baillie. It was now possible to piece together "the connexion between certain symptoms, and certain deviations from natural structure" which, recall, the *Critical Review* saw as affording "the most effectual assistance to the physician, and enables him to judge of the real state of the morbid body, previous to death".[415] However, in adding descriptions of symptoms, Baillie did not establish such connexions automatically.

But in adding symptoms, Baillie was at pains to emphasise both the difficulty involved with doing so, as well as the limited use of discussing symptoms in this manner. First he emphasised the inadequacy of his execution: "I have attempted to subjoin the Symptoms connected with them [the morbid appearances]. This part of the undertaking is attended with many difficulties, and I feel very sensible, how much the execution of it stands in need of the kind indulgence of the Public".[416] He then outlined in detail what those difficulties were: symptoms do not uniformly connect to morbid anatomy; symptoms might be the same for different changes in structure, which was especially a problem when patients attempted to describe symptoms attending diseases of the brain or heart; "Medical men" might ask poor or misleading questions when ascertaining symptoms. All of these were painted as "formidable difficulties, which obstruct the progress of our knowledge of the symptoms of diseases".[417] Baillie offered scant consolation by stating that it was only the "accumulated observations of

[413] Baillie 1793a, xiii, 8-11; Baillie 1797, 11.
[414] Baillie 1793a, 10-11; Baillie 1797, 13.
[415] Smollett (ed.) 1794, 375.
[416] Baillie 1797, xiv.
[417] Ibid., xv.

many individuals will probably, at length, in a great measure overcome them"—hardly possible in one work. Baillie therefore did not enter into "minute detail" on symptoms, focusing on "only [those] which are most constant, and most strongly characteristic of the diseases to which they belong".[418] In other words, he described those symptoms that were already well-defined through the observations of many which was necessarily of limited use in advancing knowledge of symptoms, even though they were paired with diseased appearances where possible by Baillie.[419] As a result, Baillie "placed" his accounts of symptoms at the end of each chapter so that "the anatomical part of the work may not be interrupted".[420] The work was focused on his observations of morbid anatomy, on treating disease as an anatomical subject, and so the regular order of cases—symptoms and then post-mortem findings—was disrupted by Baillie. His addition of symptoms was a concession, but not a complete one, as even though he gave the evidence on each side of the process of connecting symptoms with post-mortem findings, he did not initiate a procedure for that connection.

3.4: Conclusion

Genre was central to the presentation of Baillie's work. In the first section we saw that Baillie's papers were written as cases. This made their epistemic claims widely acceptable as the cognitive work they intimated was that of 'thinking in cases', which was typical of work on disease in this period. Baillie gave many of his papers to the Society for the Improvement of Medical and Chirurgical Knowledge. Here, medical practitioners influenced by the work of William and John Hunter met with the express intention of improving physic and surgery. In that context, Baillie was encouraged to provide general descriptions of disease as well as illustrations. He did so within the case history narrative genre, simultaneously making his work fit within the context of society and wider context of the study of disease in the period. But his specific focus on morbid anatomy was unique, and his use of genre flexible enough to emphasise that, even as he met the demands of the case history narrative and the society.

The second section argued that *Morbid Anatomy* was presented in a different genre, what I call the instructional anatomical description. Baillie's work took on the structure and descriptive features of an anatomical book, specifically Hunter's *Anatomical Description*,

[418] Ibid., xvi.
[419] Baillie was also at pains to point out that he had omitted many symptoms on the basis that their relation to diseased appearances was insufficiently known for a variety of reasons. Ibid., xvi-xvii.
[420] Ibid., xvii.

working to present the study of disease as an anatomical subject. In place of the narrative aspects of cases, Baillie provided generalised descriptions of morbid appearances that omitted the patient encounter so crucial to cases. There were difficulties with presenting disease in such a way however, as on occasion it was necessary to discuss clinical information and cases in order to be sufficiently comprehensive in his consideration of morbid anatomy. This worked against his overall generalisation of diseased appearances by emphasising points of singularity. It was difficult to remove cases entirely from the study of disease, which informed some of the criticism that Baillie received regarding the work. Nevertheless, in *Morbid Anatomy* Baillie outlined an alternative way of studying disease that was intended to challenge, though not necessarily to supplant, normative practice and the writing of case histories. Instead, anatomical inquiry into disease was to be prioritised.

But this vision was criticised by Baillie's contemporaries in Britain. As it was not a work of cases, critics were sceptical of the utility of the work, except for instructing students. At the same time, Sömmering, who was sympathetic to the books aims, saw room for improvement regarding its content. Baillie addressed both of these concerns in the second edition of *Morbid Anatomy* published in 1797. The content was updated, greatly expanded, and improved. The key addition to the work was that of descriptions of symptoms that attended the diseased appearances, which was a direct response to his British critics. Other additions directly responded to Sömmering's translation. Many of these additions worked to make the work have greater utility for case histories. Nevertheless, Baillie maintained the integrity of the original aims and presentation of the book by continuing to disrupt the narrative features of cases, and ensuring that the descriptions of morbid anatomy remained centre stage.

Baillie's next book, *A Series of Engravings Accompanied with Explanations which are Intended to Illustrate the Morbid Anatomy of Some of the Most Important Parts of the Human Body* (1799–1803) was also a work in the instructional anatomical description genre. Essentially an illustrated version of *Morbid Anatomy*, Baillie once again presented disease as an anatomical subject. In the next chapter we will see that this presented difficulties that illuminate the contingency of Baillie's presentation. Here, this continuation serves to emphasise that presenting disease as anatomical was central to his entire project of publishing books on the subject of disease. The use of the instructional anatomical description genre promoted his vision of the study of disease as anatomical, and the perpetuation of that vision through a number of publications played a central role in shifting the study of disease in Britain to a more anatomically focused practice, which will be discussed in Chapter 5.

Chapter 4: Illustrating Morbid Anatomy, Making *A Series of Engravings*

In July 1798, one year after the publication of the second edition of *Morbid Anatomy,* Matthew Baillie's project moved on as William Clift began illustrating the first part of *A Series of Engravings Accompanied with Explanations which are Intended to Illustrate The Morbid Anatomy of Some of the Most Important Parts of the Human Body* (1799–1803).[421] The title of the new work reflected that it was continuous with both the content and goals of *Morbid Anatomy*: the work was intended to promote the study of disease by anatomical means. But producing illustrations of morbid anatomy in a systematic manner presented new challenges and problems for Baillie. These issues centred around presenting illustrations of individual preparations of morbid anatomy as able to represent or characterise a whole class of similar, though unseen, morbid appearances. Lorraine Daston and Peter Galison have argued that such epistemic dilemmas were resolved in this period by adhering to the standards of 'truth-to-nature'. Scientific practitioners emphasised the fidelity of their illustrations to what was seen in nature through a variety of means in order to promote their images as epistemically reliable knowledge. For Daston and Galison this was guaranteed through the imposition of the natural philosopher's "specialized vision on their artists".[422] In this chapter I show that Baillie adhered to such standards in the production of *A Series of Engravings*. Daston and Galison's account of truth-to-nature focuses almost completely on the scientific author and their intentions. But I argue that the creation of epistemically acceptable images was the result of a complex series of active and interactive collaborations between authors, artisans, materials, and processes. Rather than imposing his vision on artists, Baillie—and authors like him—worked collaboratively with artists who worked to enhance the epistemic credentials of the work. I show this through analysis of the various stages of the illustration of the preparations that were the subject of *A Series of Engravings*, bringing preparation, preparatory drawing, copperplate, and printed image together in an academic publication for the first time. By demonstrating that a suite of differently skilled and motivated individuals were responsible for coproducing Baillie's images, and in turn knowledge about diseased appearances, I thus expand the scope of Daston and Galison's characterisation of truth-to-nature. For *A Series of Engravings*, author *and* artisans produced images of diseased appearances that functioned to point to changes in structure and texture, rather than being completely faithful to nature, fulfilling the ostensive

[421] Clift *Accompts*, 1794–1837.
[422] Daston and Galison 2007, 82-84.

function of the work to represent changes in morbid structure. The widened scope that my argument gives to truth-to-nature emphasises that epistemic images were created and sustained by a range of makers and by readers, not solely by the author.

By creating illustrations of morbid anatomy, Baillie extended his presentation of morbid anatomy as an anatomical subject. After the publication of his second edition, this continued his promise "to render it [*Morbid Anatomy*] more perfect", but this was likely a development of his work since the first edition had been published in 1793.[423] In that year, Baillie's first papers with accompanying illustrations were published in the first edition of *Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge*.[424] Between 1795 and 1797 Baillie gave three more papers at the society which were published in the second edition of the society's transactions, all on similar subjects to his previous papers, with one paper being illustrated.[425] These publications were complemented with Baillie's publication of William Hunter's *An Anatomical Description of the Human Gravid Uterus, and Its Contents* (1794) which Baillie described as rendering "the whole work complete".[426] Both the possibility and need to 'complete' *Morbid Anatomy* in a similar manner to Hunter's work were thus raised in Baillie's publishing in this period. Such difficult work was perhaps made especially attractive by his new focus on private practice. Carin Berkowitz has argued that illustrated anatomy folios were an important way in which Enlightenment anatomists in Britain cultivated their reputations. An illustrated anatomy folio marked their authors as experts, implying that the anatomist had expert vision, potentially cementing their place in the history of anatomy through stylish demonstrations of scientific and aesthetic judgement.[427] Such folios were the apogee of the instructional anatomical description genre (see Chapter 3), and by publishing *A Series of Engravings* Baillie simultaneously presented morbid anatomy as an anatomical subject capable of being rendered in images, and himself as an expert in doing so. Baillie was certainly successful in regard to the latter—it is striking that most historiographical attention afforded to Baillie has been the direct result of this work.[428] Contemporary opinion

[423] Baillie 1793a, xi.
[424] Baillie published four papers in the first edition, see Chapter 3.
[425] The papers were: 'An Account of a Case of Diabetes, with an Examination of the Appearances after Death', 'An Account of a singular Disease in the great Intestines', and 'An Account of the Case of a Man who had no evacuation from the Bowels for nearly fifteen Weeks before his death'. Only the paper on the great intestines had an illustration. Baillie 1800a, 70-89; Baillie 1800b, 144-151; Baillie 1800c, 174-183.
[426] Baillie in Hunter 1794, viii.
[427] Berkowitz 2015b, 174-179.
[428] Bertoloni Meli 2015, 209-242; Bertoloni Meli 2017; Cunningham 2010, 218 (though he discusses *Morbid Anatomy* too); unusually Porter conflates *Morbid Anatomy* with *A Series of Engravings*, Porter 1997, 264. An account of Baillie's more immediate legacy after his death is discussed in: Nenatic 2010, 509-527.

of *A Series of Engravings* was complimentary (in contrast to the reception of *Morbid Anatomy*) and emphasised that the conception of the work was as important as its execution. As the *Annual Review* put it in 1802 after the final instalment of fasciculi was published:

> With these two fasciculi the author terminates this beautiful, accurate, and, *in every respect, important work*, which, in its execution, exhibits an uniform degree of perfection, and forms a collection of morbid anatomy worthy of the valuable publication which it was intended to illustrate.[429]

Such positive reception was crucial to the adoption of morbid anatomy as a practice and genre in the early nineteenth century in Britain, which will be discussed in the next chapter. For our purposes in this chapter, this reception prioritises the question of *how* Baillie resolved the epistemic problems associated with presenting irregular diseased appearances as generalised anatomical knowledge, problems that needed to be solved in order that *A Series of Engravings* could be viewed as a work of anatomy.

This chapter has three parts. In the first I focus on the manner in which Baillie justified the illustrations to his contemporaries. Images of disease were not uncommon at this time but were typically presented alone as singularities in the manner of monsters.[430] Works that showed multiple illustrations of diseased appearances were linked to specific museum collections and emphasised the content of the museum rather than presenting systematised representations of specific diseased appearances.[431] In both of these types of representation, the singular nature of the diseased appearance shown was emphasised. By contrast, Baillie presented specific preparations of morbid anatomy as representative of a whole class of similar objects, and thereby the diseased appearance itself in what Daston and Galison have defined as a 'characteristic' image.[432] In order to make this acceptable to his contemporaries, Baillie took the same steps as he did in the text-only *Morbid Anatomy.* He rhetorically emphasised his trustworthiness by highlighting his unique position in being able to access three anatomical collections, intimating that he was best placed to recognise regular and irregular appearances. But he also took further steps to epistemically justify his images. This was necessary as anatomical illustrations were artificial, two-dimensional reconstructions of three-dimensional parts. Thus, Baillie took pains to show that he was judicious in his choice of what was represented in *A Series of Engravings* through a detailed discussion in his preface of what

[429] Aikin (ed.) 1802, 847 emphasis mine.
[430] Fontes da Costa 2002, 265-288. See Chapter 3.
[431] For example, Frederick Ruysch, Andreas Bonn, Eduard Sandifort. See: Bertoloni Meli 2015, 209-242; Bertoloni Meli 2017, 23-80.
[432] Daston and Galison 2007, 82.

morbid appearances might usefully be illustrated. Furthermore, he stressed the reliability of the artist (William Clift) and engravers (William Skelton, James Basire II, and James Heath) involved with the project, taking pains to associate their work with extant anatomical image-making standards. Doing so made his images reliable in the eyes of his contemporaries, as they enabled what Steven Shapin has termed 'virtual witnessing' of natural phenomena.[433] Central to these standards was the reliability of the artisans who carried out the work illustrating natural objects. Artists were said to have closely copied nature by authors, whilst engravers adhered to 'standards of accuracy' that ensured that drawings were rendered into copperplates that could be printed in a trustworthy manner, enabling printed images to be seen as genuine representations of natural objects.[434] In this regard, Baillie's work provides a good example of how Daston and Galison argue authors of "pathological" illustrations ensured their works were epistemically acceptable to their contemporaries.[435]

Baillie's work can thus be equated with the rhetoric of 'truth-to-nature', but not all of the aspects of it that Daston and Galison identify. Daston and Galison claim that truth-to-nature was produced in atlases through the "imposition of the naturalist's will upon the eyes and hands of the artist", in a process that they term "four-eyed sight".[436] In the second part of the chapter, I show that rather than imposition, Baillie and his artist, William Clift, worked together to produce illustrations that 'characterised' disease and, furthermore, that the ability to do so rested on the image making strategies of Clift, an expert practitioner in his own right who was nevertheless well-attuned to Baillie's needs. In making this argument, I make three substantive points that work to reframe Daston and Galison's consideration of the making of 'truth-to-nature' images: (i) the importance of the images appearing 'true' to the audience necessitated representing natural objects like they were the real thing in their detail, even as authors and their artists were ostensibly representing the archetype of the object; (ii) though there were clear and pertinent parallels between art and science in this period they did not simply "converge" as Daston and Galison argue, rather these parallels were the point of active and interactive work between authors and artisans in this period; (iii) artists and illustrators of natural philosophical atlases had different aims for their work, which directly influenced

[433] Shapin 1984, 481-520.
[434] On copying for anatomical works see: Kemp 1992, 77-88; Kemp 1993, 25-60. On 'standards of accuracy' for engravers see: Doherty 2012, 15-36.
[435] Their example is Jean Cruveilhier's *Anatomie patholoquie du corps humain* (1829–1842). Baillie would fit better with their earlier use of Hunter in the text, as well as chronologically in regard to their claims. See section 4.1 Daston and Galison 2007, 75-77, 82.
[436] Ibid., 84-98.

decisions over the representations of nature, and thus knowledge about the natural world. In this regard, the work of scientific authors with their collaborators diverged from the standards that Sir Joshua Reynolds advocated at the Royal Academy of Arts, which Daston and Galison claim were widely applicable to works on nature in this period.[437] Therefore I compare Reynolds's articulation of the 'central form' of nature with work by Clift for Baillie's book. Reynolds argued that the painter acquired the idea of the 'central form' of objects—the most beautiful and true form of the natural object—through repeated observation of a number of individual objects. Clift, meanwhile, identified what he termed the 'Idea' that was to be communicated in single morbid anatomy preparations as his aim. These were similar types of observing the natural world—attempting to see the 'truth' in nature by artists—but differently aimed. Reynolds promoted this vision to serve the Royal Academy of Art's elite interests by ensuring that intellectual endeavour was prioritised with, in David Solkin's terms, only the "morally, socially, and intellectually superior" appreciating such work.[438] By contrast, Clift's worked to ensure that the ostensive function of the work—the clear representation of diseased appearances—was carried out. In order to do so, Clift unusually used monochrome watercolour so that the preparatory drawings were viewed as natural by contemporaries. Furthermore, through a close comparison of preparation, watercolour, and final printed image, I demonstrate that Clift used various strategies to make the diseased appearances even clearer in print. These included regularising unusual but non-morbid structures to appear as regular anatomy in order not to distract from the morbid content of the image, as well as ensuring that the diseased appearance was particularly clear in the illustration. The second section therefore demonstrates that the processes of making images in this period were necessarily collaborative, emphasising the importance of artisanal skills at all stages of the illustrating and printing process. Furthermore, it shows that the rhetoric of faithfulness to nature and reliability in practitioners so crucial to 'truth-to-nature' was directed at ensuring that the ostensive function of the work was carried out in practice.

The third part moves this argument on to the printing processes associated with illustration in this period. Engraving might be seen as a further 'copying' process, but it was in fact interpretative on the part of engravers who translated Clift's watercolours into a series of lines and dots on a copperplate. The idea that engraving was simply one of copying stems from parts of the bibliographic literature on prints—most notably Arthur M. Hind—who termed such

[437] Ibid., 81-82.
[438] Solkin 1993, 273.

prints as 'reproductive' prints and viewed their dominance in printmaking during the eighteenth century as evidence of a general "decline" of printmaking.[439] However, as a number of art historians have observed, such 'reproductive' work was in fact central to the visual culture of the entire early modern and Enlightenment periods, with most artworks being known through print.[440] Similarly, whilst 'original' printmaking, such as that by Dürer, Rembrandt, Blake, and Goya has been prioritised in the literature on print in terms of technical innovation, 'reproductive' printmakers were also highly innovative, the two types of printmaking working in conversation, with reproductive printmakers in the eighteenth century able to represent a huge variety of textures in print through various types of burin mark on the copperplate.[441] In natural philosophical printmaking, Megan Doherty has demonstrated that 'standards of accuracy' were developed at the Royal Society from the seventeenth century to ensure that printed images were seen as valid carriers of knowledge.[442] By the late eighteenth century, these standards were well-developed and accepted. All three of Baillie's engravers—Skelton, Basire II, and Heath—had links to the Royal Society and had worked on medical or natural history publications prior to their work for Baillie. Standard techniques such as crosshatching were employed to shade images, giving an impression of bulk and texture to objects. Such techniques were central to the goals of Baillie's work, since morbid anatomy was concerned with the changes in texture of the body, making it necessary for those textures to be clearly rendered. In that regard, the process of engraving was a further stage at which diseased appearances were made 'characteristic' of disease, and regular parts made similar to prior renderings of regular structure in the canon. At the same time, the engraving stage was a final opportunity to ensure that the content of the work was indeed complete, as Baillie made last-minute additions to his work. The printing process was thus a final area of collaboration between Baillie and artisans in the making of *A Series of Engravings*.

The chapter argues firstly that Baillie employed the rhetoric of truth-to-nature in order that his illustrations would be seen as trustworthy representations of disease, that 'characterised' all similar morbid appearances; and secondly that this rhetoric was supported by image making strategies but did not dictate those strategies. Whatever Baillie's intentions might have been, they were mediated through the prevailing standards and expectations relating

[439] Hind 1963, 118, 197.
[440] Hults 1996; Clayton 1997.
[441] See for example, Pierre-Imbert Drevets's portrait of Cardinal Du Bois (1724) in: Hults 1996, 290-291.
[442] Doherty 2012, 15-36.

to scientific illustration in this period, and were contingent on the skills and desires of the various practitioners involved.

4.1: The Rhetoric of 'Characteristic' Images and Truth-to-Nature

A Series of Engravings was made up of ten fasciculi published in five sets of pairs, consisting in total of seventy-four plates and 203 figures.[443] That this took Baillie, Clift, and three engravers five years to complete shows that the work was a significant undertaking; Baillie did not read papers to learned societies or publish anything else in this period.[444] At the same time, Baillie's working life substantially changed. He resigned from teaching at Great Windmill Street and from his role as physician to St George's Hospital in 1799, devoting all of his time to private practice for the remainder of his career.[445] The only exception to this new focus was Baillie's continued publication of illustrations on the subject of morbid anatomy. Historians have emphasised that publishing illustrations could advance the careers and legacies of their authors, even acting as a financial 'safety net' for medical practitioners.[446] Yet Baillie's private practice was already beginning to become successful when the first drawings for the work were made. *A Series of Engravings* represented a significant investment of time and money into publishing on morbid anatomy at a time when, arguably, Baillie did not need to be so concerned with publication for the sake of career advancement. In this section I argue that for Baillie, *A Series of Engravings* was a virtuoso demonstration of his alternative model for the study of disease. Lesions now took centre stage, speaking for themselves as representations of disease without theoretical trappings and comment. But in presenting illustrations of individual morbid anatomy preparations as able to characterise an entire class of similar objects, and thereby the disease itself, it was necessary for Baillie to demonstrate the reliability of his images to his contemporaries. In doing so, Baillie employed the rhetoric of truth-to-nature identified by Daston and Galison. He emphasised that his illustrations closely copied nature, that the practitioners involved were reliable, and that he was an expert. Baillie thus presented his

[443] Baillie 1799–1803.
[444] The only publication of Baillie's in this period was *An Appendix to the First Edition of the Morbid Anatomy* (1798) which provided the additions and updates published in the second edition to those who had bought the first. Baillie did not read a paper to any society between 5 September 1797 and 6 November 1804. Crainz 1995, 82, 121.
[445] The increase in demand from private patients was in part due to him obtaining David Pitcairn's practice in 1798. Jones 2008.
[446] Berkowitz 2015b, 171-208; Bynum and Wilson 1992, 41-42.

images as 'characteristic' of disease. In this section I show that both Baillie's rhetoric and use of preparations in illustrating his work supported this.

In the preface to the first edition of *Morbid Anatomy* Baillie had promised readers "by the addition of new materials, […] to render it more perfect".[447] Whereas the second edition expanded upon, corrected, and added to the original work in part to render the work more acceptable to critics (see Chapter 3), the rationale for *A Series of Engravings* was more directly in keeping with the original goals of *Morbid Anatomy.* As Baillie explained, much of what had been previously published to illustrate diseased parts had little organisation. It would therefore be of benefit *to anatomy* to remedy this where possible:

> Whatever has been hitherto done upon this subject, has been without any regular plan, and scattered over various works, some of which are expensive, and others difficult to be procured. It seemed to me, therefore, to be an important desideratum in Anatomy, to comprehend in one work, upon some regular plan, Engravings of the chief Morbid Changes of Structure in the most essential parts of the human body, which are capable of this kind of illustration.[448]

A Series of Engravings was envisaged, just as *Morbid Anatomy* had been, as a work of anatomy on the subject of disease. Indeed, though the works were made to be capable of being understood independently from one another, Baillie highlighted the link between the two works in his preface: "The order of the Engravings will correspond very much with that of the description of diseased changes of structure, in my book upon Morbid Anatomy; but the two works will be made independent of each other".[449] *A Series of Engravings* was thus framed by Baillie as a project that was continuous with *Morbid Anatomy*.[450]

Yet this created an epistemic difficulty for the illustrations. Baillie presented individual preparations of morbid anatomy as representative of diseased appearances. That is, single preparations 'stood in' for an entire class of similar—though not identical—objects. The difficulty was the move from type to archetype: how could singular appearances of irregularity be seen as properly demonstrating all kinds of that diseased appearance? Such epistemic difficulties have been explored by the historians Daston and Galison. In their work, *Objectivity,* they explore how two-dimensional images of natural objects in scientific atlases were made

[447] Baillie 1793a, xi.
[448] Baillie 1798–1803, 1.
[449] Ibid., 5.
[450] In this regard, the publication by Baillie of William Hunter's *An anatomical description of the human gravid uterus and its contents* (1794) that made "the whole work complete" was a precursor to *A Series of Engravings*. Baillie in Hunter 1794, viii.

acceptable as scientific knowledge. In the eighteenth century, they define the prevailing epistemic standard for all scientific illustrations as 'truth-to-nature'. This is where the scientist's "body and mind converged to discover a reality otherwise hidden to each alone", through a patient process of observing widely, comparing observations, and then analysing and synthesising them. The images typical of scientific atlases in this period were "reasoned", imbued with a generality "that transcended the species or even the genus [of a plant, for example] to reflect a never seen but nonetheless real plant archetype".[451] Typically this manifested itself in illustrations that were compounds of observations—a plant showing its fruit and flower simultaneously for example—although other illustrations, like the naturalistic illustrations of William Hunter's *Gravid Uterus* also, they claim, were consistent with truth-to-nature as these illustrations were intended to be the "*Typus*" image.[452] These were illustrations that typified all gravid uteruses through their exacting mimetic quality coupled with Hunter's personal discernment that claimed that these illustrations could indeed stand for a whole class of natural object.[453] However, Daston and Galison argue that such modes could not be employed for illustrations of disease. The *'Typus'* image was concerned with depicting the "pure phenomena", which they claim could not exist for disease due to the huge variety in such appearances, whilst idealised images had "venerable associations with health and normality" that made their use also inappropriate.[454] Instead, illustrations of disease were 'characteristic': a hybrid of the idealised and naturalistic modes. Daston and Galison argue that it was "no accident that pathological atlases were among the first to use characteristic images", and identify such works as transitional between 'truth-to-nature' and their later conception of 'mechanical objectivity'. Their example in this section is Jean Cruveilhier's *Anatomie pathologique du corps humain* (1828–1842), an author who published a whole generation after Baillie.[455] Baillie thus presents a better chronological point of transition between modes of representation, especially given that his work was directly related to Hunter's (published 1774), and because his work became an important model for works on individual organs affected by disease in the early nineteenth century (see Chapter 5). In such works, individual objects were

[451] Daston and Galison 2007, 58-60.
[452] Ibid., 75-77.
[453] Massey problematises aspects of Daston and Galison's view of Hunter's work by demonstrating the way in which the convention of naturalistic images was constructed in *Gravid Uterus* and not simply employed: Massey 2005, 73-91.
[454] Daston and Galison 2007, 82.
[455] I take it that their point regarding the 'transition' of modes of representation is that the use of 'characteristic' images by what they term 'pathological atlases' beginning around the turn of the eighteenth century helped towards mechanical processes of representing individual objects—sans author or artist—being viewed as desirable. Ibid., 82-83.

depicted in order to stand for an entire class of similar objects. Heterogeneity was expected, but well-chosen examples could still represent the whole class.

Central to the production of 'characteristic' images was the combination of the faithful representation of the individual object being illustrated and the author's judgement in choosing that object. It was necessary to demonstrate the ability *both* to select, compare, and judge natural objects, *and* from these observations produce generalised knowledge. In order to be 'true to nature' the anatomist had to be, in Daston and Galison's terms, "steeped in but not enslaved to nature as it appeared".[456] Such a rhetorical approach is apparent in Baillie's work. In *A Series of Engravings* Baillie emphasised his unique access to his own and his uncles' collections (just as he had in *Morbid Anatomy*), using them to select preparations that were in themselves, he claimed, sufficient to represent specific diseases: "The Engravings will be principally taken from preparations in Dr. Hunter's and Mr. Hunter's Museum, and also from preparations in a collection of my own that has now become extensive […] preparation[s] illustrating very clearly any particular disease".[457] He also underlined his ability to compare and judge what preparations best represented diseased appearances in print by explaining in detail what kinds of morbid appearance were suitable for such illustration, concluding that: "It does not seem to be useful to represent by engravings, every diseased change of structure to which the internal and more important parts of the body are subject".[458] Instead, he highlighted his discernment and ability in being able to identify those morbid changes that were "capable of being illustrated" or where illustration would particularly benefit the viewer's comprehension of the appearance ("of being more distinctly impressed upon the mind by figures of them being exhibited to the eye").[459] This demonstration of his discernment coupled with his unique knowledge of various collections, was a strategy designed to reassure the reader that what was portrayed was reliable in its depiction of the object. In Daston and Galison's terms, Baillie employed the rhetoric of truth-to-nature in order to represent his images as 'characteristic', based on Baillie's position and ability.

What this meant for the content of *A Series of Engravings* can be understood in reference to Figure 6, which shows "a stricture in the oesophagus near the cardia" at all its

[456] Ibid., 58-59.
[457] Baillie 1799–1803, 6.
[458] "Some are so little consequence as not to be worth representing; others can be so clearly understood from description, as not to require being illustrated by engravings; and others still may be of such a nature as not to be capable of being adequately represented by this kind of art." Ibid., 4-5.
[459] Ibid., 5.

stages of illustration—preparation, watercolour, copperplate, and print.[460] The first figure in Fasciculus III, Part IV demonstrates a largely healthy section of oesophagus with the trachea attached. The morbid appearance is towards the bottom of the image, point G where there was "A stricture near the cardia, where the sides of the oesophagus are very thick and hard, and where there is some degree of ulceration upon the internal surface".[461] The preparation was chosen by Baillie because it had a clear number of advantages for emphasising the stricture, most notably that it allowed the stricture to be compared with a healthy section of oesophagus (point F) as well as a healthy section of the trachea. At the same time, it is easy to locate where this preparation would have originally been in the body, as there are several features remaining that allow the viewer to correlate it with their knowledge of normal anatomy, such as the part of the os uoides (A) at the top of the illustration, and the left part of the bronchia (D) at the bottom.[462] Thus, Baillie's promise to illustrate those preparations that showed "very clearly" the diseased appearance was carried out.[463]

[460] Ibid., 53.
[461] Ibid.
[462] Ibid. Recall that Baillie expected the reader to have a good knowledge of normal anatomy prior to reading the book.
[463] Ibid., 6.

Figure showing human remains redacted

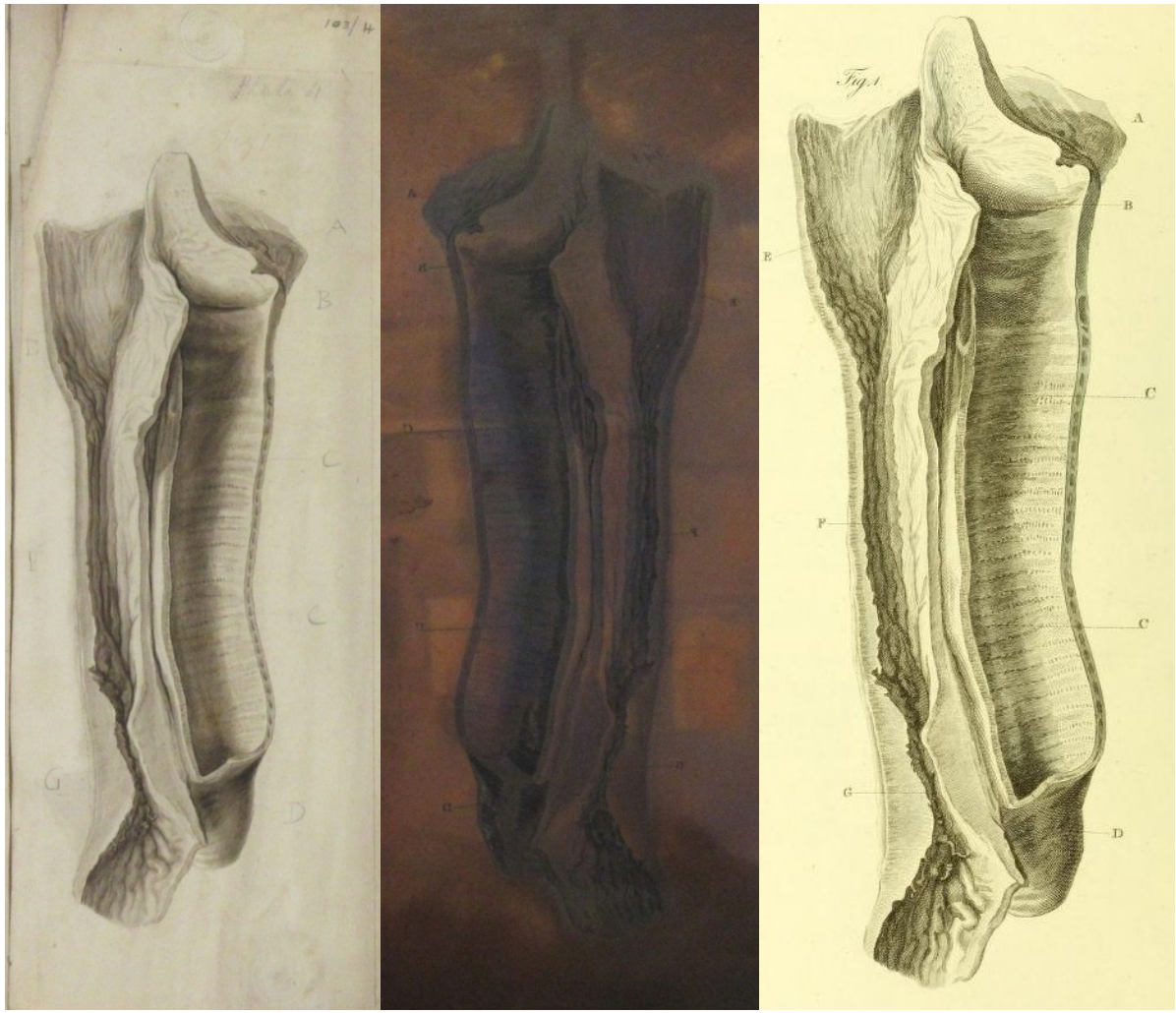

Figure 6: "Stricture of the Oesophagus near the cardia" shown in preparation, watercolour, copperplate, and print. Preparation no. 34.18, University of Glasgow Anatomy Museum; William Clift, watercolour of the same, MS103 Royal College of Physicians Archive; James Basire II, copperplate engraving, MS103A Royal College of Physicians Archive; Matthew Baillie, Fasciculus III, Plate IV, Figure 1, *A Series of Engravings* 1799–1802.

But the illustration did not show the diseased appearance in isolation. Captions and descriptions situated the diseased appearance in the illustration, and within the wider context of morbid anatomy. The section of *A Series of Engravings* in which Figure 6 appeared was intended to illustrate ulcers and strictures of the oesophagus. Baillie stated that ulcers typically occurred at either end of the oesophagus rather than in the middle, and the example in Figure 6 showed an ulcer at the lower end, combined with a stricture. Baillie explained that with ulcers it was common also to find "the surrounding parts are a good deal thickened, and very frequently have a gristly hardness. In these cases there is stricture, and where the hardness is strongly marked, the disease is considered to be of a cancerous nature".[464] Baillie was circumspect in his ascription of the stricture as being caused by a cancerous tumour due to the small amount of ulceration, fitting with his general circumspection regarding diagnosis, but was clear on what the morbid appearance in the illustration was.[465] Either way, the text provided information that the image alone could not.[466] In this regard, text was of vital importance to Baillie's project. Figure 7 (from Fasciculus II, Plate III, Figure II), which shows ossification of the pleura (pleural membrane), is not identifiable without reference to the text.[467] In spite of this, however, the diseased appearance is clearly visible in the illustration. Points B and C show "Two considerable ossifications in it" and "A portion of the pleura thickened, in which some very small ossified spots are beginning to be formed" respectively. Point A, like the preparation used to demonstrate stricture of the oesophagus, allows comparison with the diseased part as it displays "A portion of pleura in its natural state".[468] Baillie's discernment in choosing appropriate preparations to represent diseased appearances was therefore evident in the utility of the illustrations in demonstrating those appearances, with captions and descriptions carefully employed to emphasise that fact.

[464] Ibid., 51.
[465] Later commentary states that there is a tumour (classed as the hard wall and ulceration in Baillie's work) which has replaced the oesophageal wall "completely encircling the tube, for a distance of about 6 cm. The diameter of the tumour is only 2 cm". Marshall (ed.) 1970, 233.
[466] Of course, *A Series of Engravings* was not alone in that regard. Anatomical illustration relied on text, though there were different attempts at incorporating them into images. For example, see: Kusukawa 2012.
[467] I tested this hypothesis during a public talk I gave to the Yorkshire Medical and Dental History Society. A room full of doctors and dentists were unable to identify the part without the caption. My thanks to the audience for their cooperation!
[468] Baillie 1799–1803, 33-34.

Figure showing human remains redacted

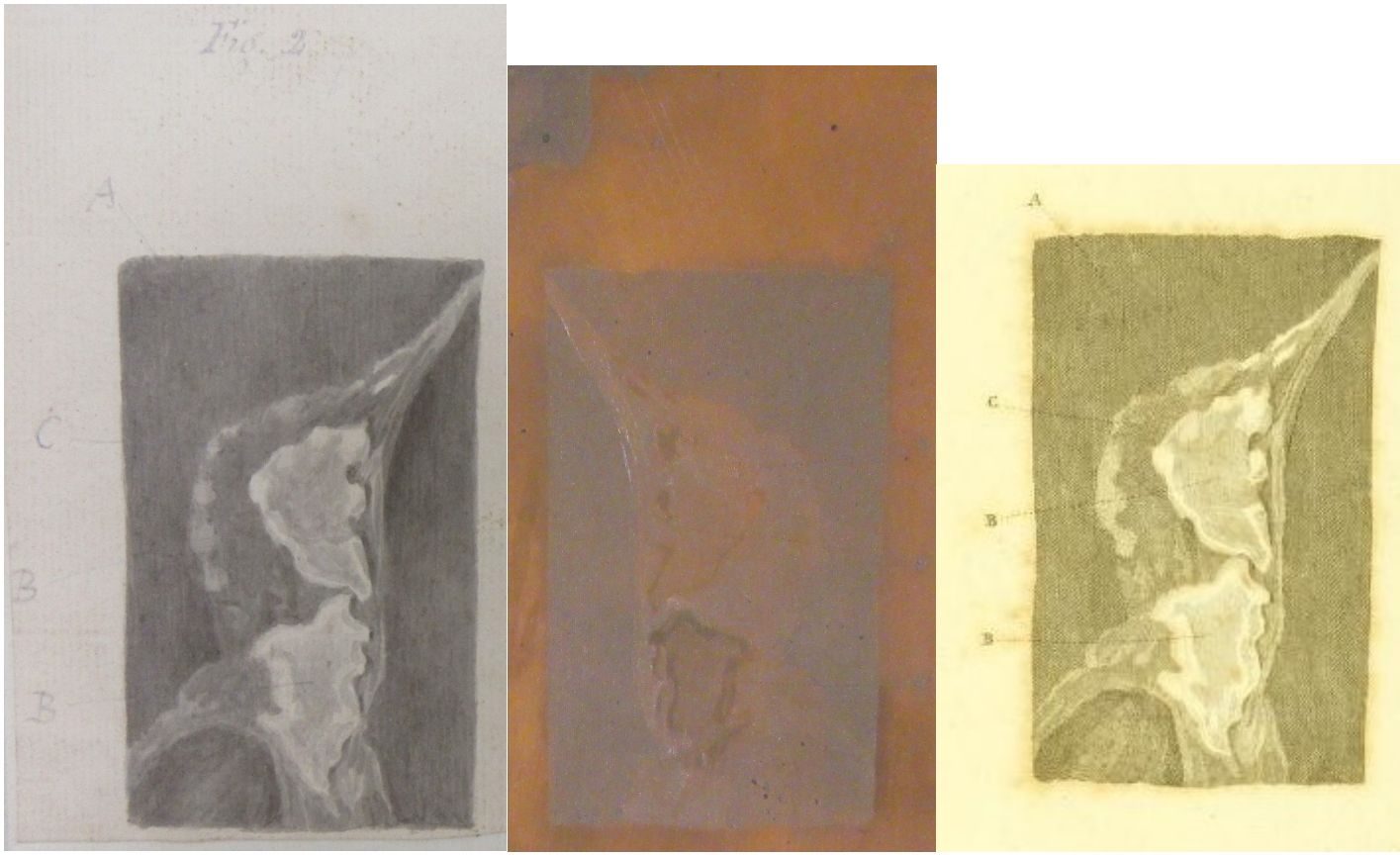

Figure 7: "Ossification of the pleura" shown in preparation, watercolour, copperplate, and print. Preparation no. 18.38, University of Glasgow Anatomy Museum; William Clift, watercolour of the same, MS103 Royal College of Physicians Archive; William Skelton, copperplate engraving, MS103A Royal College of Physicians Archive; Matthew Baillie, Fasciculus II, Plate II, Figure 2, *A Series of Engravings* 1799–1802.

Baillie's rhetoric that his images were indeed 'characteristic' of entire classes of diseased appearances was therefore supported by his judicious selection of preparations to represent those classes. Furthermore, he highlighted to his readers that the practitioners who rendered the preparations visible in print were trustworthy. When describing his artist, William Clift, Baillie drew attention not only to his skill, but also to his anatomical knowledge.

> The Drawings will be made by a young man, who is not only very well skilled in his own art, but who possesses a considerable share of knowledge in Anatomy. This last circumstance is of great importance in giving to Anatomical Drawings distinctness and fidelity of representation.[469]

Before illustrating Baillie's work, Clift had been an assistant to John Hunter. Arriving in London in 1792, Clift replaced William Bell, Hunter's previous assistant, after he had left for India.[470] Clift came from a very poor background in Cornwall, but was recommended to Hunter through a family connection due to his talent as a draughtsman. His apprenticeship fee was waived on the understanding that he would assist Hunter in his work: helping with dissections, making preparations, taking dictation, looking after his collection, and drawing illustrations of the museum's contents.[471] This arrangement did not last long however, as John Hunter died in 1793. Nevertheless, Clift remained notably loyal to his employer, continuing to look after his collection in financially difficult circumstances until it was bought by the government and donated to the Company of Surgeons in 1799, upon which Clift was appointed the first curator of the museum. This was in no small part due to his excellent knowledge and care of the collection, which was remarked to be in a better state at its sale than at Hunter's death.[472] Between 1793 and 1799, Clift was largely reliant for an income on Everard Home and Baillie. As both medical men were in relatively early stages of their career Clift's income was low despite his valuable work in maintaining John Hunter's collection, and Clift repeatedly requested more money from Home and Baillie.[473] With this in mind, both men employed Clift as draughtsman for illustrations, with Clift receiving a fee of a guinea per plate for *A Series of Engravings*.[474] Thus, there were a number of practical attractions in hiring Clift for the job of

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[469] Ibid., 6-7.
[470] "The greater number of the Drawings belonging to Mr Hunter were made by Mr William Bell, who lived fourteen years in Mr Hunter's house for that purpose; and the descriptions are chiefly in his hand-writing. Mr Bell afterwards attained an appointment as Surgeon in the East India Company's service; and died at Bencoolen in Sumatra in the year 1792." Clift *Catalogue of drawings in Cube II* 1824.
[471] Dobson 1954, 7-11; Sloan 2007.
[472] Dobson 1954, 12-24.
[473] Ibid., 7-11.
[474] Clift *Accompts*, 1794–1837. In this period Clift also received a commission to make coloured plates of snakes for Patrick Russell, who published a work on the serpents of India in 1801. Dobson 1954, 16.

illustrating Baillie's work. Not only was Clift talented and in need of employment, he had received his training from John Hunter and proved himself capable of dealing expertly with the collection after his death.

Similarly, when discussing his engravers (William Skelton, James Basire II, and James Heath), Baillie highlighted that their previous work engraving anatomical subjects made them particularly suited to the task: "The Engravings will be made by artists who are well known to the Public, more especially for the excellence which they have attained in Anatomical Engraving, and who are ambitious of increasing their reputation by the attention which they propose to bestow upon this Work".[475] Skelton and Basire II had both been trained by the engraver to the Royal Society, James Basire (the first, Basire II's father), and had carried out such work for a number of literary and natural philosophical publications prior to working for Baillie. After his father's death in 1803, Basire II followed his father as engraver to the Royal Society and much of his work was for the *Philosophical Transactions*, whilst Skelton had become a notable portrait engraver by the end of the century.[476] They carried out the bulk of the work for Baillie; Skelton engraved thirty plates, Basire II twenty-nine. Meanwhile, Heath was responsible for fourteen plates.[477] Heath had been apprenticed to Joseph Collyer the younger, later being elected associate to the Royal Academy in 1791, and appointed historical engraver to George III in 1794. His scientific engraving included J. C. Lavater's *Essays on Physiognomy* (3 volumes, 1789) and George Shaw's *General Zoology* (14 volumes, 1800–1826).[478] The suitability and therefore trustworthiness of both anatomist and artisan was thus emphasised to the reader. It was clear that the practitioners involved were appropriate for the task, that they would be true to nature.

4.2: Invisible Labour of Truth-to-Nature

The ability of Baillie's images to represent nature in an epistemically acceptable manner rested on image-making strategies undertaken by skilled artisans. In the previous section we saw that Baillie employed a rhetorical strategy designed to demonstrate the trustworthiness of the epistemic content of his images that Daston and Galison have termed truth-to-nature. This was supported not only by his use of preparations and descriptions of them, but also by the specific

[475] Baillie 1799–1803, 7.
[476] On Skelton see: O'Donoghue 2009. On Basire and Basire II see: Peltz 2007.
[477] Baillie 1799–1803.
[478] Heath 2008.

suitability of his artist and engravers in representing those preparations. Daston and Galison identify art and science as converging in the representation of nature in this period. I argue, however, that though there were certainly similarities between them, the aims of elite artists like Sir Joshua Reynolds (Daston and Galison's example) and William Clift (Baillie's illustrator) were different, entailing different representational strategies, even as many of their practices were similar. Specifically, I make three key points: (i) natural philosophers needed to demonstrate that they were true to the detail of the objects depicted, even as they presented their images as an archetype; (ii) the similarities between artistic and natural philosophical representation were the result of parallels between them, not simple convergence; (iii) the aims of art and natural philosophy were different and led to different emphases in the representation of nature. Furthermore, through a close examination of Clift's work for *A Series of Engravings* I demonstrate that the work was coproduced with Baillie. Clift was an expert in his own right, though well-attuned to Baillie's needs. Clift described his work as bringing out the 'Idea' in the preparation—seeing the diseased structure in the mess of anatomical preparations. To do so, he made monochrome watercolours of the preparations. Clift's use of monochrome watercolours for anatomical purposes was innovative. He used the specific features of watercolours, such as the layering of membranes of paint to lighten and darken areas, to produce illustrations that were texturally detailed as well as naturalistic. But his work also enhanced the diseased appearances in order that the ostensive function of the work—to point to diseased appearances—was sufficiently fulfilled. By focusing on Clift's work, I show that the creation of epistemically acceptable scientific images was a conscious choice by a number of practitioners in this period, and that their combined work was central to the creation of such images and contingent on it.

Daston and Galison identify the artistic discourse that coalesced around the Royal Academy of Arts as converging with that of natural philosophy in this period.[479] Reynolds's famous 'Discourses' at the Academy promoted the pursuit of the 'grand style' of painting that pursued moral truth through the depiction of universal subjects.[480] The doctrine was purposefully academic. Students had to acquire a good knowledge of the classics, literature, and scripture to support the Academicians' claim to be liberal artists. At the same time, observing and copying nature was also important for the young artist.[481] With these pedagogical steps as a basis, the student was better placed to capture what Reynolds termed the

[479] Daston and Galison 2007, 81-82.
[480] Hoock 2003, 54.
[481] Ibid.

"idea of that central form" that marked truly great art.[482] In such art, "particularities" were omitted in favour of representing "general ideas".[483] So though "reiterated experience and a close comparison of the objects in nature" were important pillars of such work, the 'great' artist would acquire "a just idea of beautiful forms" from such work, learning to correct nature, "and what may seem a paradox, he learns to design naturally by drawing his figures unlike to any one object".[484] But following these pedagogical steps did not necessarily entail greatness. Ultimately, the conception of the 'central form' in painting rested in the mind of the artist: "Could we teach taste or genius by rules, they would be no longer taste and genius".[485] Thus, the great artist made a careful study of the classics and nature in order to render it more truthfully, and therefore more beautifully, than could be found in nature. In Daston and Galison's terms, such work created "The more successful synthetic image".[486]

But the theoretical similarity that Daston and Galison focus on belies the practical aims and work that went into such renderings of nature. Close focus on such work serves to undermine the sense of easy convergence between art and science that they promote. This is not to say that there were not clear and pertinent parallels between art and science in this period, but that through the narrative of convergence, Daston and Galison have reduced the active and interactive work between artists and (for example) anatomists to a formality.

Returning to the example of Reynolds demonstrates the issues with this view of simple convergence well. In contextualising their overtly theoretical content it is significant that Reynolds's discourses were given at the newly formed Royal Academy. As David Solkin has observed, the formation of the Royal Academy stoked "tensions that burst out into a highly politicised schism" in British art that was centred around the challenging of "the hegemony of the connoisseurs" by the general public and their more "catholic tastes" encouraged by the exhibitions that had greatly widened the audience for art from the 1750s.[487] As President of a society designed to promote elite artistic interests, Reynolds specifically and forcefully differentiated the work of ascertaining the 'central form' of nature from popular modes of rendering nature such as decorative work. And in doing so he specifically equated types of natural philosophical work, such as collecting, with the work of "the lower painter":

[482] Reynolds 1770 (published 1975), 45.
[483] Reynolds 1771 (published 1975), 57.
[484] Reynolds 1770 (published 1975), 44-45.
[485] Ibid., 44.
[486] Daston and Galison 2007, 81.
[487] Solkin 1993, 3, 159.

> Such a student [attempting to produce 'great' work] will distain the humbler walks of painting, which, however profitable, can never assure him a permanent reputation. He will leave the meaner artist servilely to suppose that those are the best pictures, which are most likely to deceive the spectator. He will permit the lower painter, like the florist or collector of shells, to exhibit the minute discriminations, which distinguish one object of the same species from another; while he, like the philosopher, will consider nature in the abstract, and represent in every one of his figures the characters of its species.[488]

Martin Kemp has suggested that the equation of collectors of shells with the 'lower' arts was a direct response to William Hunter's lectures at the Royal Academy in his role as Professor of Anatomy there.[489] Certainly, Hunter collected such items himself.[490] Meanwhile, the accusation of 'servility' had been levelled at Hunter's artist, Jan van Rymsdyk, likely for his naturalistic, though stylistically different, renderings of the gravid uterus across several works.[491] Whatever the fairness of these accusations, the point is that they were made at all. Furthermore, Reynolds's distinction between ways of approaching 'species' is particularly pertinent in demonstrating that there were differences perceived between types of artistic and natural philosophical representation, even if they were only slight. Where the artist abstracted from the natural world in order to capture the character of its species, natural philosophers were painted as determinedly remaining within the world in order to further divide and subdivide species.[492]

Artistic and natural philosophical representation is thus better understood not so much as converging, as having a number of close parallels. One key way in which this is apparent is in the discussion of details of images by natural philosophers. Though both Hunter and Baillie, for instance, presented their images as representing archetypes, they nevertheless flagged specific details to their readers that located their illustrations as representing real natural objects. These details covered both specific things seen in the image, and specific details of the image's making, both intended to ensure the audience knew that they were 'true'

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[488] Reynolds 1770 (published 1975), 50.
[489] Reynolds's comments were in response to Hunter defending naturalism as capable of producing beauty: Hunter 1769–1772 (published Kemp 1975), 38; Kemp 1992, 77-88; Massey 2017; 68-103.
[490] Black 2007, 63-100; McCormack 2007, 101-116; Chaplin 2015, 27-41.
[491] Mount 2006, 91; Berkowitz 2015b, 206. This may have been a result of Academicians distancing their work from painters who derived aesthetic delight through sheer technical skill. Solkin 1993, 267-268.
[492] The term 'species' was used by the philosopher John Locke to approach a range of problems that he saw as arising from the difference between our understanding of things and their underlying essence. Richard Checketts has observed that how such essences related to human experience was "open to doubt". This created a vagueness regarding precisely what was valued in painting by Royal Academicians, as it was not clear how essences might be represented. Locke 1770 (published 1975), 442-443; Checketts 2014, 89. See also: Woolhouse 1993; Ayers 1991, 15-128; Bennett 2001, 108-123. This likely served Academicians interests in making their work purposefully inaccessible to the lower classes. Solkin 1993, 273.

representations. Thus, Hunter specifically pointed out that "The womb is represented in the loose rugous slate, as it appeared when empty", whilst Baillie explained that the inflamed appearance of the inner membrane of the larynx and trachea caused by croup cannot be represented "in any engraving" from a preparation specifically because the most significant appearance was that of colour which was lost in the preservation process.[493] This was not replicated in historical painting because these works were aimed at epistemic truth, rather than the metaphysical and moral truths associated with history painting at the Royal Academy rather than the epistemic aims of natural philosophers. Whilst there were similar concerns across art and natural philosophy regarding how to approach the natural world and represent it, there were divergent aims in this work which directly influenced decisions over its representation and thus knowledge about the natural world.

Such divergent aims were central to Clift's work as a draughtsman: he was primarily focused on communicating epistemic content. This is evident in an introduction that Clift wrote for part of the catalogue at the Royal College of Surgeons on "Drawings of Morbid Parts" that organised and explained the collection. In an explanation of the main difficulties in representing morbid parts, Clift highlighted the importance of fidelity to the natural appearance. "Drawings of Diseased parts are generally not so accurate as those of Natural parts, excepting the Bones, for many circumstances are against their being very accurate". Inaccuracy was caused primarily by the difficult circumstances of "the removal". Clift, displaying a detailed knowledge of anatomists' practice, explained that many diseased parts, even when searched for by the anatomist, were essentially found "accidentally" and were stolen, with the effect that "they often come to those who want them for Representation badly disposed and badly preserved". Commonly, the efforts to ensure that the diseased appearance was preserved meant the preparation was "often obliged to be twisted, or take unnatural forms" such that the regular parts of the preparation were distorted, or obscured. Clift highlighted that this caused difficulties in delineating between regular and irregular parts as only a general idea of the anatomy could be obtained from viewing the preparation, a difficulty further compounded when the preparation was in a poor condition. Despite these difficulties, however, Clift emphasised that it was often the case that the draughtsman would be able to communicate what the diseased appearance was, as that was the priority in making the preparation: "yet they [preparations] may be such as are necessary to give an Idea [to the draughtsman] of what it is", though these difficulties required drawings to be accompanied with descriptions as "many

[493] Hunter 1774, explanation of Plate VII, no pagination; Baillie 1799–1802, 29.

diseases could hardly be understood by themselves".[494] Throughout this short passage we see that Clift's work in representing morbid appearances was primarily concerned with accuracy. This was so that the anatomical information the preparation was intended to communicate could be sufficiently represented. Clift's concerns in his anatomical illustration were thus married to those of the anatomists he worked with. Furthermore, Clift's emphasis on the difficulties that rendering ill-made preparations of diseased parts brought about for the draughtsman show that accuracy had to be ascertained by the draughtsman. An 'Idea' might be visible through the anatomist's work, but clarity was also necessary. It was provided by the draughtsman.

With such an aim in mind, Clift had tailored his practice in two ways in order to make representations of disease that were as clear as possible: he attended Baillie's lectures at Great Windmill Street, and he produced watercolours of the preparations. In the previous chapter I showed that Baillie's lectures on morbid anatomy were very similar to the content of *Morbid Anatomy.* In attending these lectures, Clift was effectively taking further training in viewing morbid anatomy preparations as Baillie saw them. This emphasised to Clift what Baillie saw as important to represent for the epistemic content of the image. Clift was thus well versed in what 'Idea' Baillie wished to communicate in his images—the change in texture and structure caused by disease. Clift then used watercolour to better render those changes than had previously been the case in illustrations of diseased parts. Typically, preparatory drawings for anatomical illustration were made in chalk, pencil, or pen and ink.[495] These media had the advantage of being able to imitate the later stage of monochrome print, with techniques such as crosshatching used in these preparatory drawings just as they would be in the engraving process (see Figure 8). One of the main purposes of doing this was to guide better the hand of the engraver in the engraving process.

However, these media could be limited in rendering texture as Baillie and Clift desired. Figure 9 is a comparison between printed images of the uterus in three contemporaneous works; from left to right: William Cheselden's *The Anatomy of the Human Body* (1784 reprint), Eduard Sandifort's *Observationes anatomico-pathologicae* (volume 1, 1777), and Baillie's *A series of*

[494] Clift *Catalogue of drawings in Cube IV*, 1820.
[495] The only major survey on anatomical illustration from the Renaissance to today remains Roberts and Tomlinson 1992, though their focus is on printed works. See also: Sappol 2006. Anatomical drawing in Renaissance Italy was typically in chalk (see: Laurenza 2012; Kemp 1970, 277-288; Kusukawa 2012), whilst after this period there appears to have been a range of types of preparatory drawing.

engravings (plate published 1802).[496] Cheselden's work shows a regular external view of the uterus with the vagina dissected below. The image provided a clear sense of the anatomy of the female reproductive system as the illustration was simply rendered and clearly labelled, providing the reader with information such as point 1 showing "That side of the uterus which is next the gut", and point 10 "The external labia of the vagina".[497] Thus, the captions indicated to the reader where the organs depicted were located in reference to other parts of the body, whilst the relative proportions of those structures to each other were communicated through the image, together providing a clear sense of the part's structure as well as its place in the body. Sandifort's illustration showed a scirrhous tumour attached to the left side of the uterus in two figures, the first giving an external view and the second an internal view.[498] The image focused solely on the irregular uterus, omitting the vagina and only providing a schematic illustration of the fallopian tubes and ovaria, thus relying on the reader's knowledge of anatomy to orientate the part. The tumour was clearly visible as a growth in the first figure, as the heavy shading indicated by crosshatching on the right-hand side of the tumour rendered a sense of bulk to the growth. The second image focused on the internal swelling, with points e e, f, g g, and h h all concerned with "swelling", "thickness", or "bulge".[499] Heavy crosshatching was again used to indicate bulk, this time inside the cavity of the uterus, with leftmost point e locating the centre of the swelling. The intense crosshatching at point e required the thickened points g g, at the neck of the womb, to be indicated instead by a series of more widely spaced parallel lines that showed the breadth of the part and ensured that the crosshatched section remained in clear contrast. Thus, crosshatched renderings in one part of the image required other parts to be rendered differently. Overall, Sandifort's image is simultaneously detailed and vague; the diseased parts rendered in order to be emphasised where the regular sections were indicated by basic outlines. By contrast, Baillie's first illustration of scirrhous tumour seems to present the whole preparation 'as seen'. The part, enlarged "to nearly four times its natural size", was sectioned in order to demonstrate the texture and thickness of the enlargement

[496] Whilst Cheselden's work was originally published in 1713 it became the standard anatomical work in England during the eighteenth century. My analysis of *Eighteenth-Century Books Online* indicates that there were few other books demonstrating the whole anatomy published in this period, save for reprints such as the 1784 version of Cheselden's work. This emphasises that not only did such works have long shelf-lives, their illustrations did too. I have purposefully omitted Hunter from this comparison in order to focus on more widely available images. Bertoloni Meli 2015, 209-242 discusses Sandifort's work in relation to Baillie's. See also: Bertoloni Meli 2017.
[497] Cheselden 1784, 312-313.
[498] Sandifort 1777, 139 and plate VII.
[499] Ibid., 139 translation mine.

alongside the "smooth and natural" inner surface of the uterus (point C).[500] Meanwhile the fallopian tubes and ovaries were both shown (E E and F), though somewhat obscured by the huge swelling. Most notable in the illustration, however, is the sheer number and variety of textures that are rendered. The centre of the illustration, the 'natural' inner surface of the uterus contrasted either side with the textures of the sectioned swelling, which in turn contrasted with the outer surface of the uterus either side. Not only did this indicate that the texture at each of these levels was different, it also rendered the same textures differently through the use of light. The light source for the image was to its left—the lightest portion of the outer uterus wall (directly below the left-hand point A) was where the light hit the preparation. This illuminated the right hand scirrhous section (the right-hand point B) with the left hand scirrhous part (left B) and the right outer wall (right A) in shade by comparison. Indeed, at the top and bottom of the section, a shadow is clearly visible. In the next section I discuss how these textures were engraved. Here, I want to emphasise two points. First, Clift's image managed to provide a detailed view (unlike Cheselden) of the whole preparation that emphasised the diseased structures without compromising the regular anatomy present in the illustration (unlike Sandifort). Second, this was achieved whilst, and indeed was improved by, rendering the illustration naturalistically—the sectioned scirrhous parts (B B) were, in effect, shown at different levels of brightness allowing the substance of the surface to be seen better. It helped to demonstrate that what appeared to be a fairly smooth and uniform surface when viewed in the light was in fact seen to be far more pitted and scarred when placed in the shade. Baillie's work thus showed more detail than contemporary works through its focus on the rendering of textures.

[500] Baillie 1799–1803, 187.

Figure redacted for copyright reasons

Figure 8: Preparatory drawings of bones in red chalk for Andreas Vesalius's *De fabrica* alongside the printed version of several. Note the clear use of parallel lines to shade in chalk that was translated into the printed image. Example from Kusukawa 2012, 207-208. Jan Stephan Calcar, red chalk, E. B. Crocker Collection 1871.127, Crocker Art Collection; Andreas Vesalius, *De fabrica* 1543, 5.

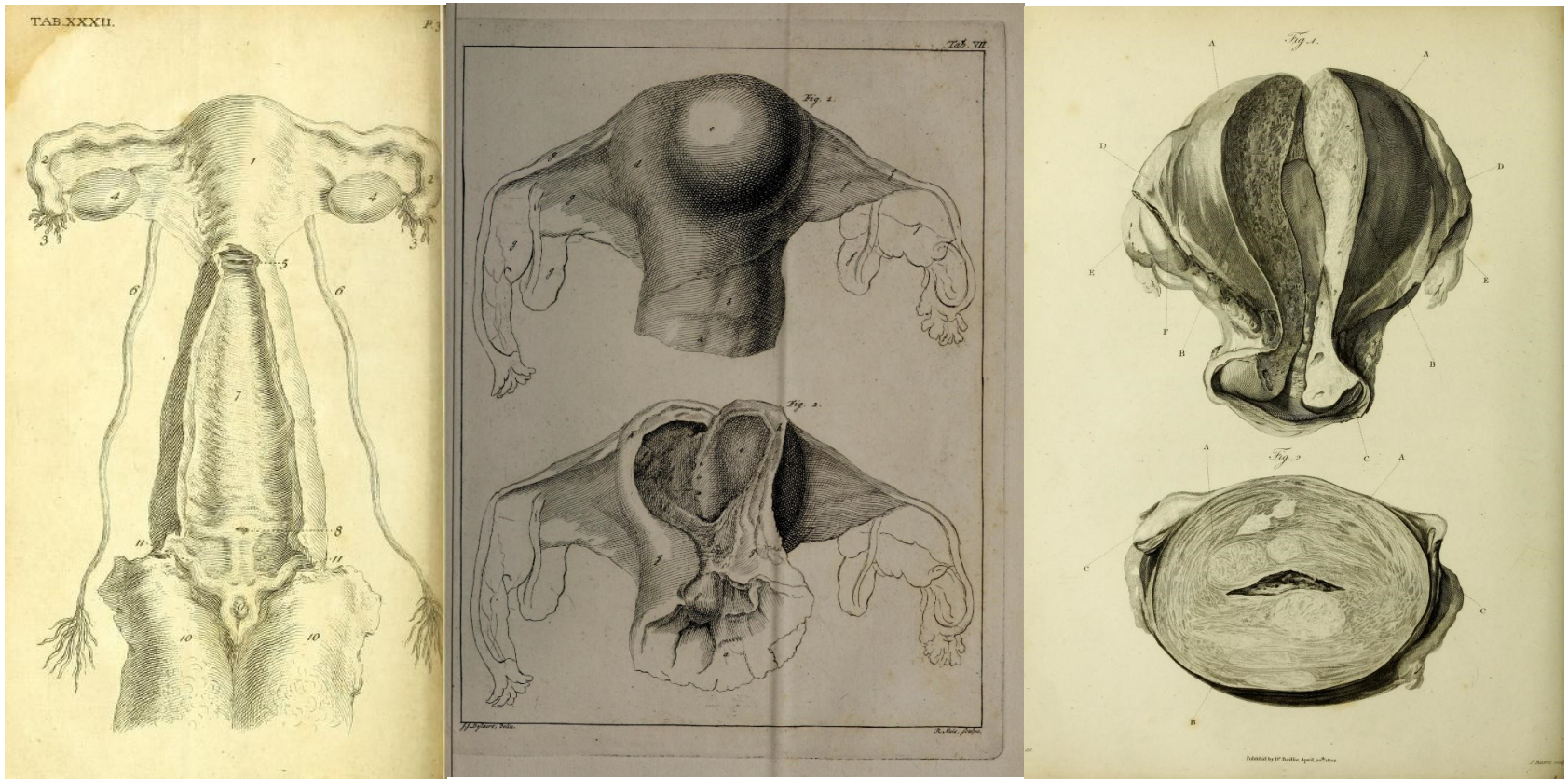

Figure 9: Printed images of the uterus in works by Cheselden, Sandifort, and Baillie. William Cheselden, Table XXXII, *The Anatomy of the Human Body* 1784 edition; Eduard Sandifort, Tabulae VII, Figures 1-2, *Observationes anatomico-pathologicae* 1777; Matthew Baillie, Fasciculus IX, Plate II, Figures 1-2, *A Series of Engraving* 1799–1802.

Watercolour was a particularly good medium for creating such effects; its systematic use for monochrome images by Clift was an innovation in anatomical illustration. Watercolour was used by natural history illustrators in the eighteenth century, both in preparatory illustrations and post-printing as colour was an important aspect in the definition and understanding of natural history subjects like plants. Botanical illustrators developed a number of different strategies for recording colour in the field, such as colour charts, in order that the information could be replicated in later final illustrations.[501] Later, when such drawings were used to create printed works, the final stage would be to hand-colour the illustrations of the plants in order that the information from the field was accurately rendered after the mechanical process of print.[502] By the end of the eighteenth century, watercolour was being used to represent cutaneous diseases, as their diagnosis was often fundamentally linked to the specific colour and pattern on the surface of the skin. The preparatory watercolours for Robert Willan's *On Cutaneous Diseases* (1808) were begun by William Darnton at least as early as 1788, with the plates being stipple engraved and coloured *à la poupée*—an expensive and laborious process whereby each impression of a plate was individually coloured.[503] The main purpose in such work was to render colour due to its epistemological importance for the subject depicted.[504] Watercolour was used as it was seen by contemporaries as a particularly good medium for representing nature and natural objects. It was typical for watercolour manuals in this period to highlight their ability in helping to depict things "as exact as the Life or Nature".[505] A particularly telling entry in Ephraim Chamber's *Cyclopaedia* emphasised that the layering of coloured washes—the application of colour over a large area of paper—over the drawing would then ensure that the image was made more like nature by lightening and shading sections:

> WASHING, in *Painting,* is when a design drawn with a pen, or crayon, has some one colour laid over it with a pencil [brushes were often called pencils in this period]; as Indian ink, bistre, or the like; to make it appear the more natural, by adding the shadows of prominences, apertures, &c. and by imitating the particular matters, whereof the thing is supposed to consist.
> Thus, they *wash* with a pale red, to imitate brick and tile; with a pale Indian blue, to imitate water and slate; with green, for trees and meadows; with saffron or French berries for gold and brass; and with several colours, for marbles.
> These *washes* are usually given in equal teints, or degrees, throughout; which are

[501] Lack and Ibáñez 1997, 87-100.
[502] Nickelsen 2006.
[503] Bertoloni Meli 2017, 123-132. On stipple engraving and colouring *à la poupée* see: Griffiths 1996, 118.
[504] On colour in the early modern period see: Baker, Dupré, Kusukawa, Leonhard (eds.) 2016.
[505] Quotation from: Peele 1735, 5.

> afterwards brought down, and softened over the lights with fair water, and strengthened with deeper colours for the shadows.[506]

The naturalness that washing provided was located in the process of softening or deepening the colours; the manipulation of membranes of uniform layers of paint by the artist. For botanical illustrators, for example, the careful combination of colours was the main concern—one manual advised against the use of black in watercolour, as it was "too heavy a colour", for example.[507] By contrast, Clift's watercolours were monochrome, which was not typically used for anatomical illustration, even at Hunter's school.[508] He typically used a dark-grey, brown-grey, or brown wash.[509] In part this was because of the anatomical preparations that Baillie wanted to depict. As Clift observed, the bleaching effect of the alcohol solution on the preparations "more or less takes off the natural appearance"; that is, the colour present in the fresh cadaver (which indicates that Clift had knowledge both of preparations and of the unprepared dead body).[510] But even in monochrome, watercolour conferred the ability to manipulate uniform layers of paint, as this enabled greater detail of the texture of preparations to be rendered.

Figure 10 is the watercolour of the scirrhous uterus shown in Figure 9 zoomed in at the top of the illustration. Here, the contrast between the two parts of the sectioned swelling is most obvious and serves to emphasise the advantage of watercolours for Clift. The sections on either side are of the same texture, and therefore were drawn in the same way. However, the layering of watercolour washes over the top of the drawing enabled the same structures to be emphasised differently simply through the processes of lightening and deepening the wash. This helped to create a naturalistic image. Most notably the shadow at the top of the section overlaps onto the other side without there being any change in how the underlying texture is represented. This was not available to more typical methods of drawing preparations such as chalk, as its use entailed firmer shading to show shadow and indicate three-dimensionality. Figure 11 shows a

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[506] Chambers 1778, 'Washing' entry. A fuller explanation of watercolour techniques, including brushes being called 'pencils', can be found in: Hardie 1967, 9-38.
[507] *The Art of Drawing and Painting in Water-Colours* 1795?, 70.
[508] The only other example of monochrome watercolours being used systematically in anatomical illustration I have found is Jan Wandelaar in his work for Bernhard Siegfried Albinus's *Tabulae sceleti musculorum corporis humani* (English edition 1749). These watercolours were for the artist's use, and not for the engravers. Wilson-Pauwels 2009, E12. Watercolours were used to draw some preparations in Hunter's collections, but this was for singular purposes and so done piecemeal, as opposed to Clift who did so systematically. Thanks to Alicia Hughes for discussing this with me. Other examples of monochrome watercolour for natural philosophical subjects can be found in Fransen and Reinhart 2018.
[509] *Photographs and List of the original drawings by William Clift for the Engravings of Morbid Anatomy by Matthew Baillie*, 1799—twentieth century.
[510] Clift *Catalogue of drawings in Cube IV*, 1820.

preparation that was drawn in chalk by Jan van Rymsdyk for a paper by Hunter published in the *Medical Observations* alongside the final printed version of the illustration, and the printed version of the same preparation in Baillie's *A Series of Engravings.* Unusually for a work by Hunter, the illustration shows an 'idealised' version of the actual preparation; Baillie's illustration was truer to the preparation as it really appeared.[511] The chalk drawing of the preparation by van Rymsdyk, meanwhile, used different firmness of shading to indicate the three-dimensional nature of the object, with the transitions between one part and another demonstrated through firm lines that give way to an absence of chalk. In the printed image this is replicated faithfully. By contrast, Baillie's printed version shows that Clift once again used shading to indicate the three-dimensionality of the object (once again the light source is to the left of the preparation), with the transitions between parts primarily shown through directional changes in the engraving. The overall result is that Baillie's image appears far more three-dimensional than Hunter's, and contains much more detail of the pharynx and of the abnormal pouch than the first illustration. Watercolour enabled this greater visibility of texture as it remains transparent; the darker tones created by the further layering of paint rather than crosshatching. Clift's work was thus the manipulation of membranes of paint—textures toned up or down in the process rather than simply drawn in chalk ready for print.

[511] Thanks to Frances Osis for discussing this point with me.

Figure 10: Enlarged view of the watercolour of "uterus enlarged from scirrhous to nearly four times its natural size". William Clift, watercolour, MS103 Royal College of Physicians Archive.

Figure showing human remains redacted

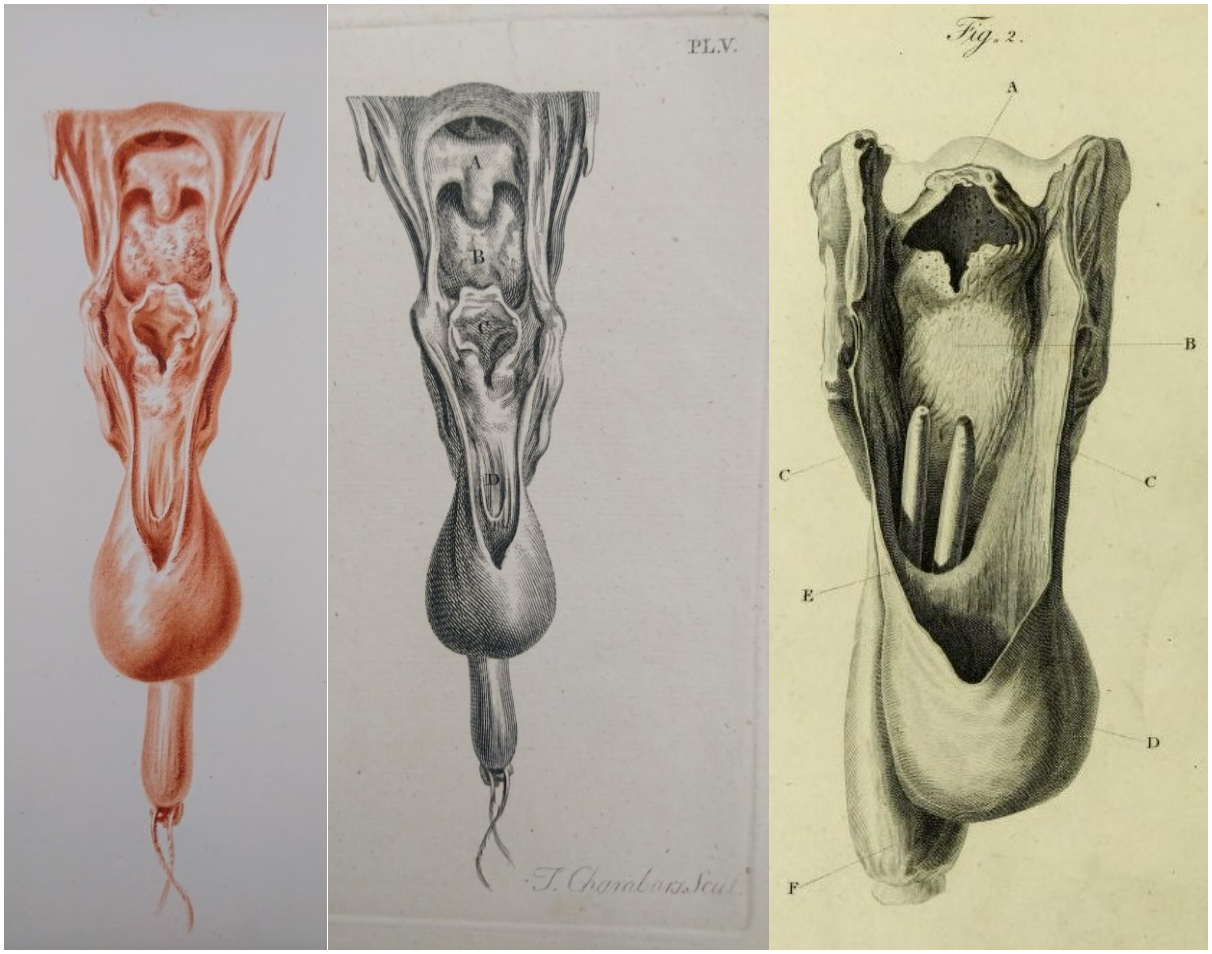

Figure 11: Illustrations of the same preparation of a blocked pharynx published by Hunter and Baillie. Preparatory chalk drawing by Jan van Rymsdyk. Preparation no. 32.8, University of Glasgow Anatomy Museum; Jan van Rymsdyk red chalk drawing of the same, MS Hunter 655 (DI.1.31) University of Glasgow Special Collections; William Hunter, Plate V, *Medical Observations and Inquiries* volume III 1764; Matthew Baillie, Fasciculus III, Plate I, Figure 2, *A Series of Engravings* 1799–1802. Thanks to Francis Osis for providing the first three images.

Yet, as Clift emphasised in his short essay on representing diseased appearances, the purpose was to represent an 'Idea' of the preparation. Using watercolours helped to render texture—a vital part of the work of morbid anatomy—in a way that was seen as natural by contemporaries. But, examining Clift's watercolours in comparison with the original preparations demonstrates that Clift's image making strategies *made* the images 'characteristic' of diseased appearances in tandem with Baillie. I outline here three key ways in which this occurred in *A series of engravings*: through selection and orientation; the regularising of anatomical parts; and the emphasising of morbid parts. Together these strategies for making 'characteristic' images demonstrate that the preparation's representation was mediated through the ostensive function of the work.

Firstly, in each case in the work, decisions were made regarding what to represent and how to represent it. Most obviously, the preparation's pot or jar was not shown (see Figures 6 and 7). In other cases, only parts or sections of preparations were shown (see Figure 12). And in every case, only a specific single orientation of the preparation was seen (see Figure 13). Figure 12, "a lateral section of a prostate gland", shows that only what was deemed relevant by Baillie was represented as most of the preparation is not shown.[512] But relevance was not simply apparent in the preparation. Figure 13 shows the reverse side of the oesophagus in Figure 6, as well as the other half of the dissection. When considered together with Figure 6, this figure shows that Baillie had options for how he represented the stricture of the oesophagus. In concert with Clift, he chose an orientation that emphasised the stricture's effect on the internal path of the oesophagus, but he might have turned the preparation in order to show the bulk of the ulceration for example. Alternatively, he might have shown both halves of the dissection in a comparison between anterior and posterior parts of the oesophagus, or the difference between the two halves of the dissection, or any other number of possibilities. The point here is that the precise view of morbid appearances was contingent on what Baillie wished to show, and this was carried out through the selection and orientation of preparations for representation by Baillie and Clift.

[512] Baillie 1799–1803, 167.

Figure showing human remains redacted

Figure showing human remains redacted

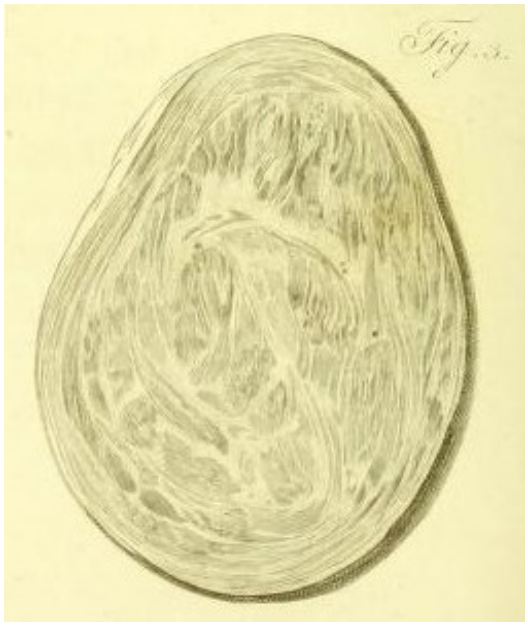

Figure 12: Whole preparation and section of the urethra showing a "scirrhous enlargement of the prostate gland". Preparation no. 43.23, University of Glasgow Anatomy Museum; Matthew Baillie, Fasciculus VIII, Plate III, Figure 3, *A Series of Engravings* 1799–1802.

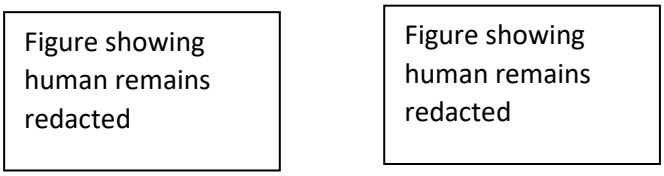

Figure 13: Reverse view "Stricture of the Oesophagus near the cardia" (left) and the other half of the preparation (right). Preparation no. 34.18 and 34.19, University of Glasgow Anatomy Museum.

Secondly, anatomical structures were regularised in order to better present the preparation as appropriately 'characteristic' of the disease, and to avoid unnecessary confusion for the viewer. Figure 14 shows a magnified view of the top half of the stricture of the oesophagus shown in Figure 6. This Figure focuses on point E of the printed image, "A lateral view of the cavity of the pharynx". I have drawn a box around the relevant part for all parts of the printing process. Clift's watercolour and the subsequent engraving (by Basire II) represented the pharynx as a fairly smooth, though fibrous surface with all of the inner lining running down toward the oesophagus just below. However, this is in stark contrast to the preparation, which has a band of horizontal tissue running across the middle of the pharynx. Such an appearance was irregular, but not morbid. The regularising of this appearance in *A Series of Engravings* was a reflection of the conventional way of representing regular anatomical structures, which was to use directional lines to indicate structure as well as texture. In Figure 14 the narrowing of the pharynx towards the oesophagus (below point E) was indicated by lines narrowing and forming a 'V' shape. The bulk of the individual fibres that made up the pharyngeal surface indicated that the texture in that part was somewhat muscular, especially around the entry to the oesophagus. The omission of the preparation's unusual appearance was surely to avoid distraction from the key point of the figure, which was to

represent the stricture lower down. Additionally, the regularising of the feature served to present the preparation as regular *except for* the stricture. Simultaneously this (a) presented the preparation as more suitable to 'characterise' stricture—it was regular apart from that section; (b) fulfilled Baillie's promise in *Morbid Anatomy* to only discuss those appearances that genuinely were morbid rather than all appearances; and (c) better tied the preparation to the history of anatomical illustration to that point. The representation of the preparation was now better suited to represent irregularity through ensuring that the morbid structure was the focus, and ensuring that the regular parts imitated the representational strategies of anatomical illustration.

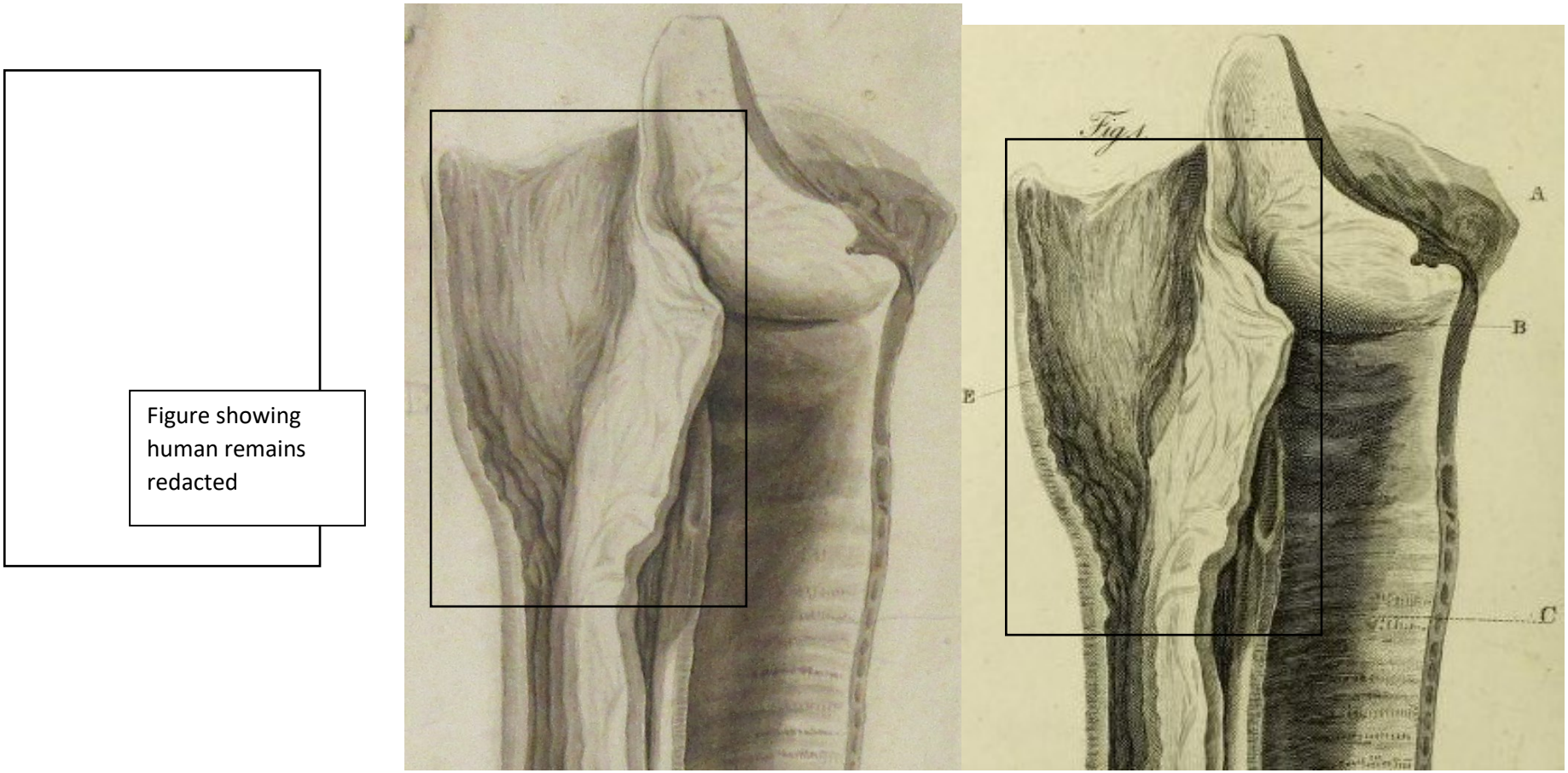

Figure 14: Enlarged view of "Stricture of the Oesophagus near the cardia" shown in preparation, watercolour, and print. Box shows the regularising of unusual but not morbid findings in the process of making the illustrations. Preparation no. 34.18, University of Glasgow Anatomy Museum; William Clift, watercolour of the same, MS103 Royal College of Physicians Archive; Matthew Baillie, Fasciculus III, Plate IV, Figure 1, *A Series of Engravings* 1799–1802.

Thirdly, diseased appearances—the subject of *A Series of Engravings*—were enhanced in illustration and engraving to better fulfil the ostensive function of the work. Returning to Figure 7 (ossification of the pleura), the diseased appearance is clearer in the printed image than in the original preparation. Points A, B, and C, are clearly picked out in the final image and were similarly highlighted by Clift in his watercolour. The preparation appears as different shades of a reddish amber colour, with a few points approaching white, but in Clift's drawing there is quite a clear distinction between the ossifications and the normal parts of pleura in the preparation. Of course, the preparation has degraded and discolouration is likely to have occurred, but that Clift emphasised the anatomical information in the preparation is confirmed by the transparent part of the preparation in the bottom left corner of the pleura. In Clift's drawing this was represented as a slightly modified version of the background (the bottom left of the printed image). Rather than present every part of the preparation exactly as was seen, Clift emphasised the relevant parts and was content to leave the irrelevant parts obscured, work that was then followed through by the engraver for the copperplate.[513] Meanwhile, Figure 15—the lower part of the stricture of the oesophagus—shows that presenting the diseased appearance sufficiently clearly to the viewer required the manipulation of the part at times. In this case, the significant differences between the preparation compared to the watercolour and printed image indicates that the lowest part of the preparation, which shows the oesophagus as it reaches the cardia, may well have been manipulated by Clift and Baillie in order to show all that it was represented as showing. In other words, the stricture may have been physically pulled in order to show the pinching of the oesophagus caused by ulceration and the lower section near the cardia opening up again to Clift, who could then illustrate the internal path of the stricture now better seen than in the pot. Alongside the enhancement of already present features, there were useful fictions perpetuated in the illustrations too. The box I have drawn on Figure 15 highlights the only discolouration visible on the preparation (compare with Figure 6). Though this section is faithfully shown in the watercolour and engraved image, the colour now extends the whole length of the oesophagus where it did not previously—all the better to emphasise the diseased appearance. This colouring was then reproduced in the engraving. In a science concerned with the differences and changes in the tissues of the body, it was imperative to make clear those differences and changes. Baillie's images thus 'characterised' morbid anatomy by ensuring the images represented those appearances clearly. They did so through

[513] This is similar to how Jan van Rymsdyk only gave outlines to parts in Hunter's *Gravid Uterus.* See: Hunter 1774.

Baillie's engagement with practitioners who were able and willing to carry out the work of orientation, regularising, and enhancement in line with prevailing epistemic standards in scientific illustration. Clift's work made possible such aims within a framework of producing clear and natural illustrations.

Figure showing human remains redacted

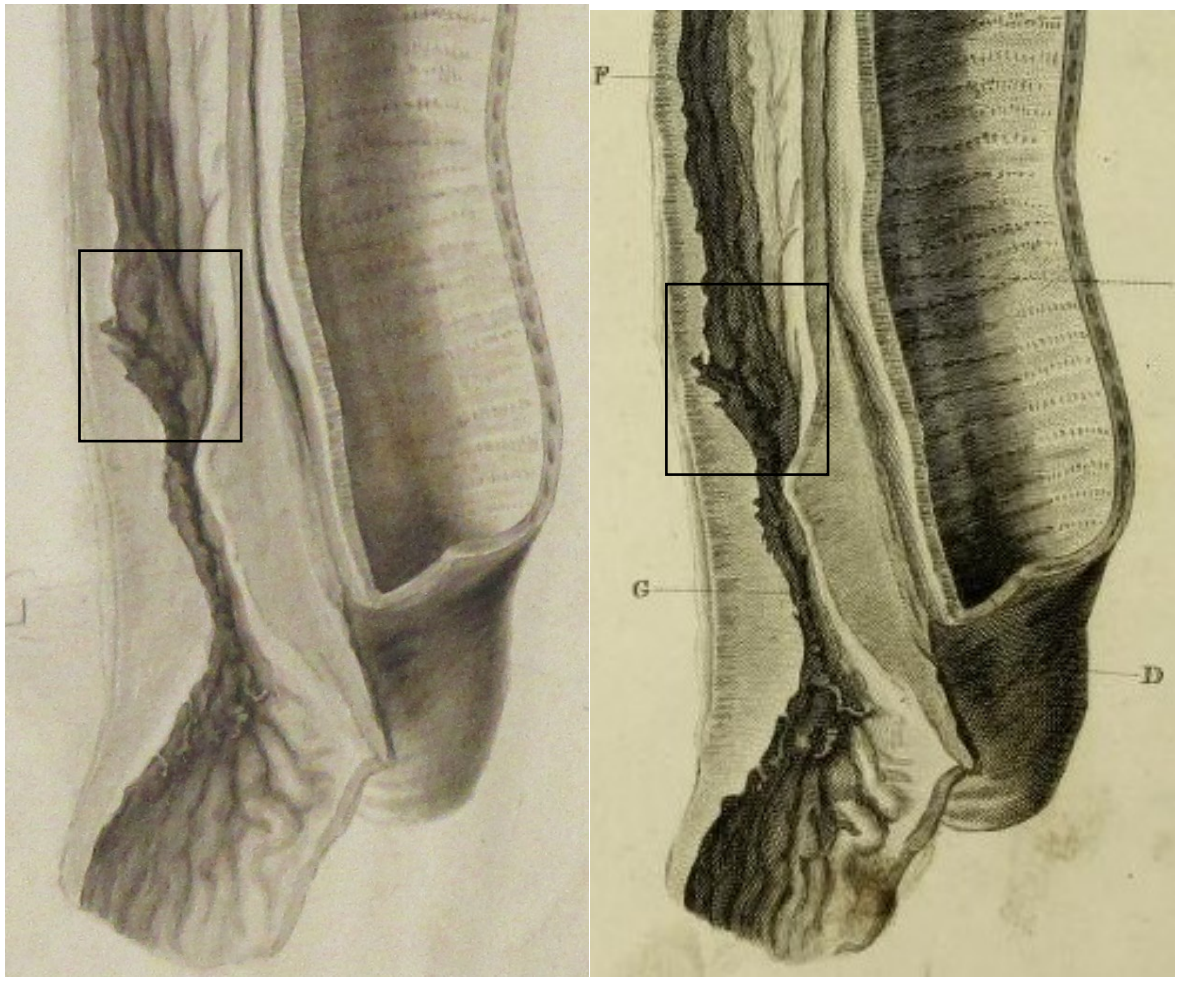

Figure 15: Enlarged view of "Stricture of the Oesophagus near the cardia" shown in preparation, watercolour, and print. Box shows that morbid parts were faithfully shown, but also that the discolouration was extended throughout the whole of the internal lining of the oesophagus. Preparation no. 34.18, University of Glasgow Anatomy Museum; William Clift, watercolour of the same, MS103 Royal College of Physicians Archive; Matthew Baillie, Fasciculus III, Plate IV, Figure 1, *A Series of Engravings* 1799–1802.

The illustrations therefore represent a *combined* effort to fulfil the ostensive function of the work. Clift's work, his use of watercolour, and enhancement of the diseased appearances, was central to the presentation of morbid anatomy preparations as 'characteristic' of disease. Daston and Galison characterise such relations between artists and anatomists in this period as 'four-eyed sight'—the scientific practitioner working to ensure that their artist effectively saw through the anatomist's eyes when drawing.[514] But Clift's role in making the illustrations for *A Series of Engravings* incorporated both understanding Baillie's concerns by attending his lectures, and his own artistic and curatorial expertise in ensuring that the 'Idea' in the object was communicated in a manner that was suitably naturalistic. Daston and Galison emphasise the "submissive pliability" of scientific illustrators in this period, but Clift's role was clearly that of an active participant and partner in the enterprise.[515]

4.3 Achieving Truth-to-Nature in Print

Print was another area in which Baillie was reliant on the skills and expertise of artisans and which bore a substantial influence on the epistemic content of the book. In order to fulfil his vision of publishing illustrations of diseased appearances, it was necessary to employ engravers who could translate Clift's watercolours into a series of grooves on a copperplate that could then be inked and printed. This process dictated what might be represented and how it might be represented, as Baillie outlined in his preface.[516] In the late eighteenth century, copperplate engraving was a well-developed industry that had longstanding relationships with authors.[517] Megan Doherty has shown that from the seventeenth century, engravers codeveloped 'standards of accuracy' with natural philosophers, especially those related to the Royal Society, which combatted the "strangeness of the possibility that a small, flat, colorless, line image on paper with no simulation of touch, sound, or smell could be taken to represent the full and actual presence of an object".[518] In this section, I argue that the relations between Baillie and his engravers—William Skelton, James Basire II, and James Heath—was fundamentally transactional. The three engravers all had experience of working on such projects and were trusted to provide sufficiently accurate renderings of the watercolours ready for printing, using techniques standard in the creation of accurate images. This relationship rested on the ability

[514] Daston and Galison 2007, 84-98.
[515] Ibid., 98.
[516] Baillie 1799–1803, 4-5.
[517] Gaskell 2004, 213-251.
[518] Doherty 2012, 16.

of engravers to interpret preparatory drawings for printing, and was carried out through the use of a series of standard methods, such as crosshatching. In making the preparations of morbid anatomy printable, Baillie relied on artisanal practices that changed the appearance of the preparation in a manner that was acceptable as reliable knowledge to contemporaries. But this process remained a point of collaboration between artisans and Baillie, as his modification of plates demonstrates.

Baillie chose his engravers based on cost and reputation. Clift's accounts from 1799 show that his first illustration for the work was offered to a "Mr Trotter"—likely Thomas Trotter—"who wanted Twenty guineas, if it were to be engraved in his best manner". But "Mr Heath, Mr Skelton, & Mr Basire agreed to do Dr. Baillie's plates at Five Guineas each, and consequently Mr Trotter was not employed".[519] Trotter was an engraver famous for his reproductions of Reynolds. He also engraved portraits, and towards the end of his career devoted himself to antique and architectural subjects due to declining eyesight.[520] I have been unable to locate any evidence that Trotter undertook engraving for natural philosophers. It is therefore unclear why Trotter was offered the work given his lack of experience in engraving natural philosophical subjects other than because of his reputation in other areas that he would bring to the work. Ultimately the enormous price he requested was clearly too much for Baillie, and indeed may have been purposefully off-putting on Trotter's part. By contrast, Skelton, Basire II, and Heath's offer was closer to the typical price for engraving in this period.[521] Though the three men offered a considerably cheaper service than Trotter, they nevertheless had good, if less famous, reputations as well as experience of engraving for scientific publications that Baillie promoted as a virtue in his book, as outlined in 4.1. In short, Baillie hired engravers who already had a record of producing natural philosophical illustrations, and would do so at an acceptable price.

By the late eighteenth century, copperplate engraving in England was a well-developed industry with mature techniques that was somewhat separate from the rest of the printing trade. Timothy Clayton's overview of the trade from 1770–1802 emphasises that the business, though precarious at times, was busy and booming. The best engravers could expect to earn a fortune and be well-respected; some mixed in courtly circles.[522] Painters, who often relied on

[519] Clift, *Accompts*, 1794–1837.
[520] Anon. 2011.
[521] The best work on engravers' prices is: Dyson 1984.
[522] Clayton 1997, 209-234. Clayton argues that the reproductive qualities of engraving were esteemed in this period (Clayton 1997, xi).

engravings for their reputations, were inclined to execute their work with its representation in print in mind.[523] Engraving techniques included line engraving (in which Baillie's work was executed), but also etching, stipple engraving and mezzotint, all of which produced different effects and were used for different purposes, including colour, for different prices.[524] Once engraved, copperplates were typically printed in separate premises to that of the rest of the work, in part because they required a 'rolling press' (like a mangle) to force the paper down into the grooves of the copperplate, where the ink was held, instead of a hand-press which printed the inked surface of woodblocks, for example.[525] The industry was therefore developed around specific types of work, technique, and printing location.

The work was highly skilled too, as Figure 16 shows. The figure is a comparison between two plates in Home's *Practical Observations on the Treatment of the Diseases of the Prostate Gland* (1811–1818), the left engraved by Clift, and the right by Basire II. As Bertoloni Meli points out regarding these plates, "Basire accomplished the task [of engraving] with a surer hand: whilst Clift often uses short broken lines and his hatching appears tentative, Basire relies on more confident cross-hatching", though both were working from Clift's watercolours.[526] The difference between the plates emphasises the specificity of the skill as well as its role in translating images between mediums. Clift was perfectly able to indicate to the engraver how to produce the copperplate through his watercolours, but was not skilled enough to do so himself. Partly this can be attributed to practice—using these techniques required knowledge of the tools of which there were different kinds and qualities. William Faithorne's guide to engraving listed three types of burin: a "square Graver [that] makes a broad and shallow stroak, or hatch", a "lozeng [which] makes a deep and narrower stroke", and one "of an indifferent size betwixt both", which provided the engraver with different capabilities.[527] George Edwards advised when buying copperplates to: "Examine your plate when you buy them, to see if they are perfectly free from scratches, dents or holes; and if they are bad, see that the maker mend them before you take them of him".[528] Purer copper provided

[523] Clayton 1997, 227. Clayton argues that print presents a more accurate picture of Britain's visual culture in the eighteenth century than surviving paintings do. Clayton 1997, xiv and 235-282.
[524] Clayton 1997, 216-218. For comparative costs of techniques see: Clayton 1997, 21-24. For an overview of techniques see: Griffiths 1996. A helpful guide to comparison between techniques is: Gascoigne 2004.
[525] On 'the engraving shop' see: Gaskell 2004, 213-251. Rolling presses retained similar design features from the mid-seventeenth to mid-nineteenth centuries. Dyson 1984, 95-99.
[526] Bertoloni Meli 2017, 115-116.
[527] Faithorne 1702, 43. Though very useful as a source for the operations of engraving, Anna-Marie Roos makes the point that Faithorne's manual leaves out important information in the creation of the full and finer effects of conventions such as chiaroscuro (contrasts of light to create a sense of volume). Roos 2012, 20.
[528] Edwards 1770, 159-160.

sufficient softness for the engraver, but required the plate to be 2-3mm thick in order to withstand the printing process.[529] Once in hand, successful use of these tools required embodied knowledge of engraving a copperplate. This was complemented by the engraver acquiring an understanding of how illustrations were made in order to cut the plate appropriately for the task. As Chambers's *Cyclopaedia* summarised, an engraver had to be a student of art in order to be successful:

> the principles of *engraving* are the same with those of painting, a person cannot expect to attain any considerable degree of perfection in this art who is not a good master of design; and therefore he ought to be well acquainted both with perspective and architecture: for the former, by the proper degradations of strong and faint colours, will enable him to throw backwards the figures and other objects of the picture or design which he proposes to imitate; and the latter will teach him to preserve the due proportion of its several orders, which the painter often entrusts to the discretion of the engraver.[530]

They also had to be mindful of the medium and materials in which they were working:

> In order to preserve equality and union in his works, the engraver should always sketch out the principal objects of his piece before he undertakes to finish them. Care should be taken that the graver be carried level upon the plate, and be pressed, as occasion requires, with greater or less force, carrying the hand as evenly as possible.[531]

The engraver's skill was therefore located in their ability to change the medium of the illustration from a two-dimensional illustration to a three-dimensional copperplate that could be put through a printing press. That skill was cognitive and embodied—the pressure of the hand on the burin was matched to a desire to render the illustration in a particular way. Figure 17 shows the variance of force required to produce the various lines and lozenges. In darker areas more force was used, creating thicker, and in fainter areas less, creating thinner lines (compare the two central bands of crosshatching). This shows that the process of engraving was one of interpreting the artist's illustration, transforming it into a series of grooves on a copperplate.

[529] Roos 2012, 29.
[530] Chambers 1778, 'Engraving, or graving' entry.
[531] Ibid.

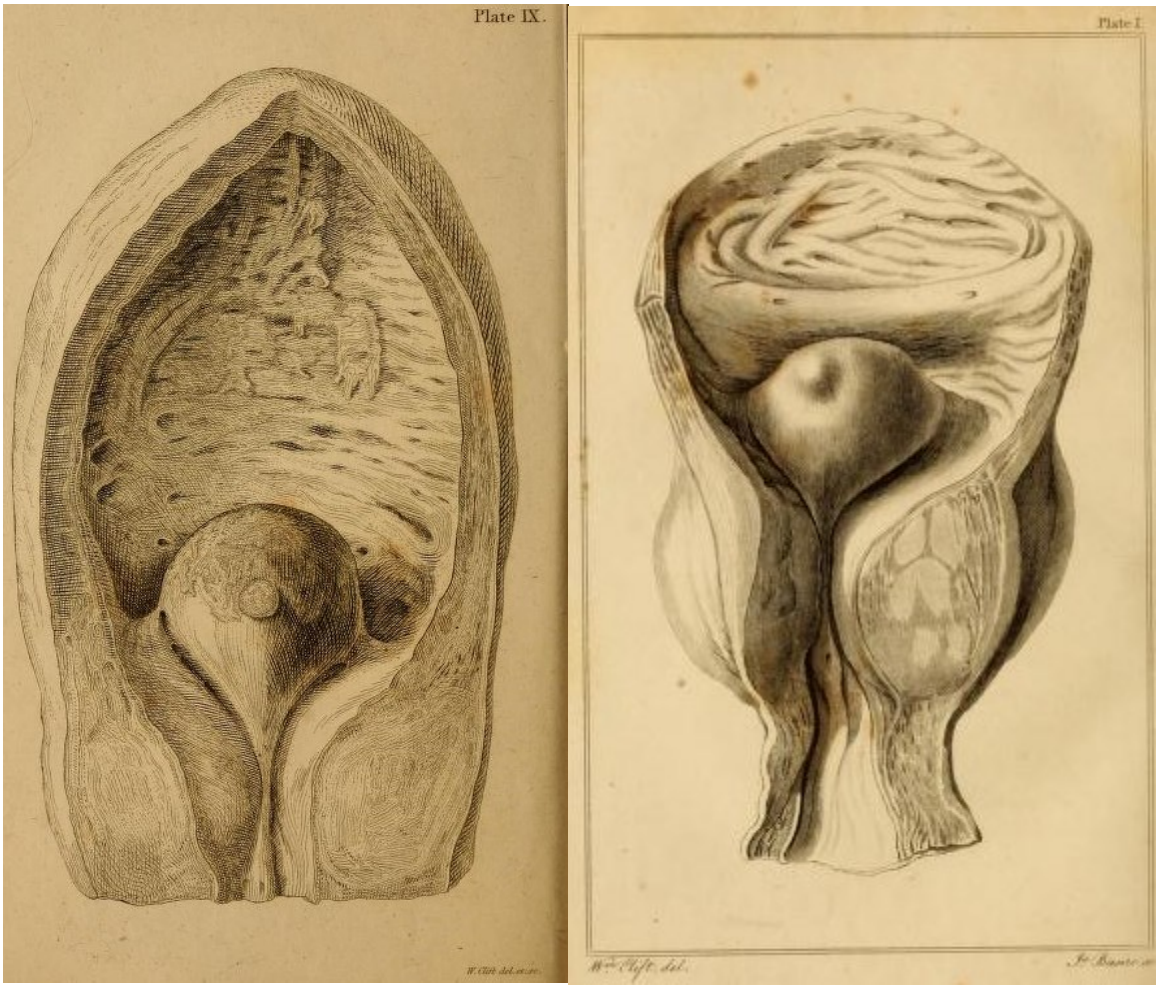

Figure 16: Comparison of engravings of diseases of the prostate by Clift (left) and Basire II (right). Example from Bertoloni Meli 2017, 115-116. Everard Home, Plate I, Figure 9, and Plate II, Figure 1, *Practical Observations on the Treatment of the Diseases of the Prostate Gland* 1811–1818.

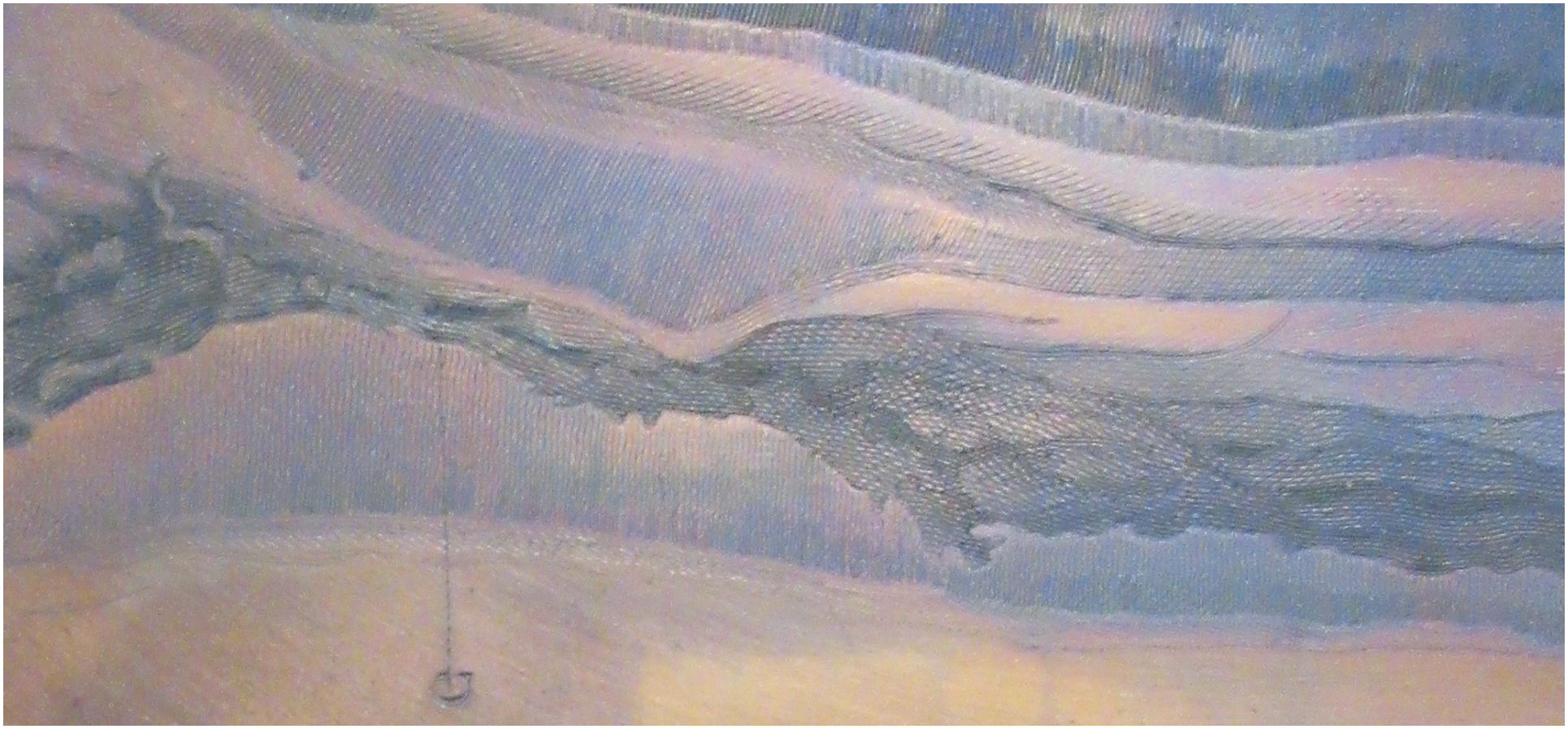

Figure 17: Detail of copperplate of "Stricture of the Oesophagus near the cardia". James Basire II, copperplate engraving, MS103A Royal College of Physicians Archive.

The development of techniques to render different textures in print using copperplate engraving since the origin of engraving in the fifteenth century had progressed to the point that a range of different burin marks to render different textures were potentially available to eighteenth-century engravers.[532] Particularly important in these developments were attempts, in Linda C. Hults's characterisation, to "retreat from linearity" that the inherently linear engraving implied towards the suggestion of "the tonality and eventually the coloristic qualities of paintings".[533] This 'reproductive' printmaking was, however, not simply imitative but fundamentally interpretative of their models.[534] Thus, as Figure 18 shows, techniques like using thicker lines in the foreground and thinner ones in the background to suggest depth was developed (by Cornelius Cort), as were types of curved hatching (for example Hendrik Goltzius), or alternatively avoiding crosshatching altogether and instead swelling and thinning spiralling parallel lines for the creation of volume (by Claude Mellan). Clearly, engraving was a highly complex process of interpretation on the part of the engravers, who applied what William Ivins has called a "net of rationality" to the illustration.[535] There were a range of such nets available to the engraver, but the material factors of copperplate printing limited these. Copperplates could only be engraved in specific ways, and it was the job of eighteenth-century engravers to confer already extant techniques onto the subject as appropriate.[536]

[532] Hults 1996, 290-291.
[533] Ibid., 254.
[534] Hults 1996, 259, 263. By contrast Hind saw this process as a "decline" with the eighteenth century representative of a "decay" in printmaking. Hind 1963, 118,197.
[535] Ivins 1969, 70.
[536] Much of the innovation in printmaking in the eighteenth century centred around making colour prints: Hults 1996, 304-309; Griffiths 1996.

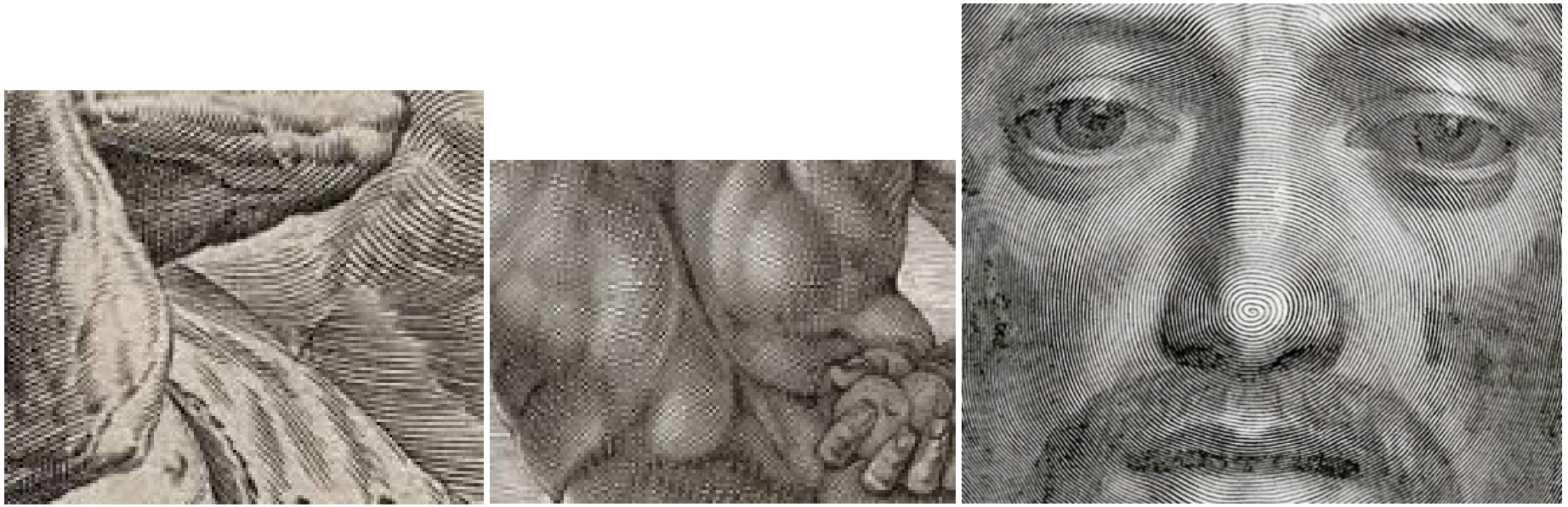

Figure 18: Details of engravings by Cornelius Cort, Hendrik Goltzius and Claude Mellan showing different developments in engraving techniques. Left (Cort) has thick lines separating the arms and cloak from the sky behind. Middle (Goltzius) shows a range of curved crosshatching to indicate various volumes, textures, and shading. Right (Mellan) shows the use of a continuous spiralling parallel line of varying thickness to create texture and depth. Cornelius Cort, line engraving 'The Labours of Hercules' (series) after Frans Floris, British Museum, 1563. Hendrik Goltzius, line engraving 'Farnese Hercules', Metropolitan Museum of Art, c.1592. Claude Mellan, line engraving 'Face of Christ on St. Veronica's Cloth', Metropolitan Museum of Art, 1649.

This was especially true in engraving for natural philosophical works. The variety of nature—in the case of *A Series of Engravings*, the textures of the body changed by disease—had to be rationalised into a series of lines. In that sense, the process of engraving was a further step in making the images 'characterise' disease. Megan Doherty has shown that the standards of engraving that developed between engravers and the Royal Society in the seventeenth century were due to "networks of exchange and collaboration" across different practices.[537] But this was not static, and the standards for acceptable images changed over the course of the eighteenth century. Figure 19 compares the illustration that accompanied William Hunter's first paper for the *Philosophical Transactions* published in 1743 (on articulating cartilages) with one executed by Clift and Basire II for Everard Home in 1799 (on a hermaphrodite dog).[538] What is clearly evident is the vast difference in the complexity of the images which was tied to developments not only in the overall technical ability of British engravers (who over the course of the century had become some of the best in Europe), but also to shifting expectations in what was deemed suitable as a representation of scientific knowledge—a change in standards. Not crowded onto a plate like Hunter's, it was shown on a larger scale with a variety of textures rendered in order to emphasise the naturalism of the image. Engravers for the Royal Society in the late eighteenth century had developed more exacting conventions towards the way in which images of nature were seen to represent it than their predecessors. Print then circulated this visual culture. Clift's efforts at regularising parts in order to emphasise disease were thus compounded by the processes of copperplate engraving that engravers associated with the Royal Society had developed, now applied to an unusual subject.

[537] Doherty 2012, 18-19.
[538] Home 1799, 157-178.

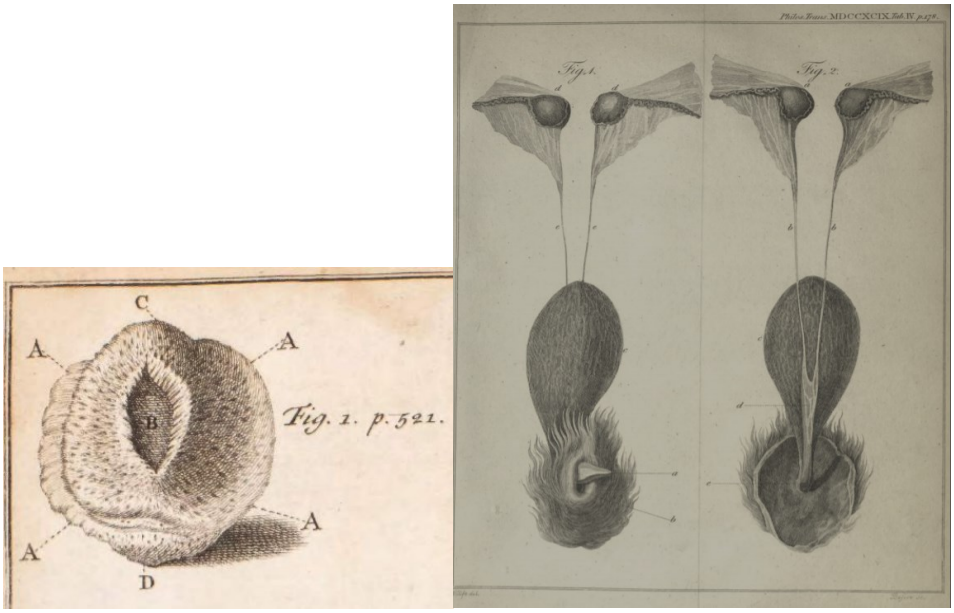

Figure 19: Illustrations in the *Philosophical Transactions* accompanying papers by William Hunter (left, 1743) and Everard Home (right, 1799) showing the development of standards of engraving at the Royal Society over the course of the eighteenth century. Hunter 1743, 521 and Table IV; Home 1799, 178.

Examining Baillie's copperplates more closely, we can see that a variety of techniques were used in order to render the texture indicated by Clift's watercolours. Figure 20 shows a highly complex, though small, figure of calculi removed from the bladder. Fundamentally, the figure was made up of a variety of lines of various thickness in different directions used to indicate the structure and three-dimensionality of the part. For example, the intensely engraved middle portion of the figure around the three "pouches" has several areas of lines running in different directions.[539] In some parts, such as directly above the bottom pouch, these are simply made up of parallel lines of varying thickness (and thus correspondingly strong burin pressure), whilst the darker portions are cross-hatched making them appear further back in the illustration. Individual lines as well as whole portions of crosshatching are curved in parts to allow the texture of the part to be apparent. Meanwhile, the lower portion of the part appears less warped by the pouches through the use of dotted directional lines. This further lightened the lines through reduced pressure on the burin, and gave the lower part of the figure a more 'sweeping' structure compared to the tightly knotted upper part.

[539] Baillie 1799–1803, 144-145.

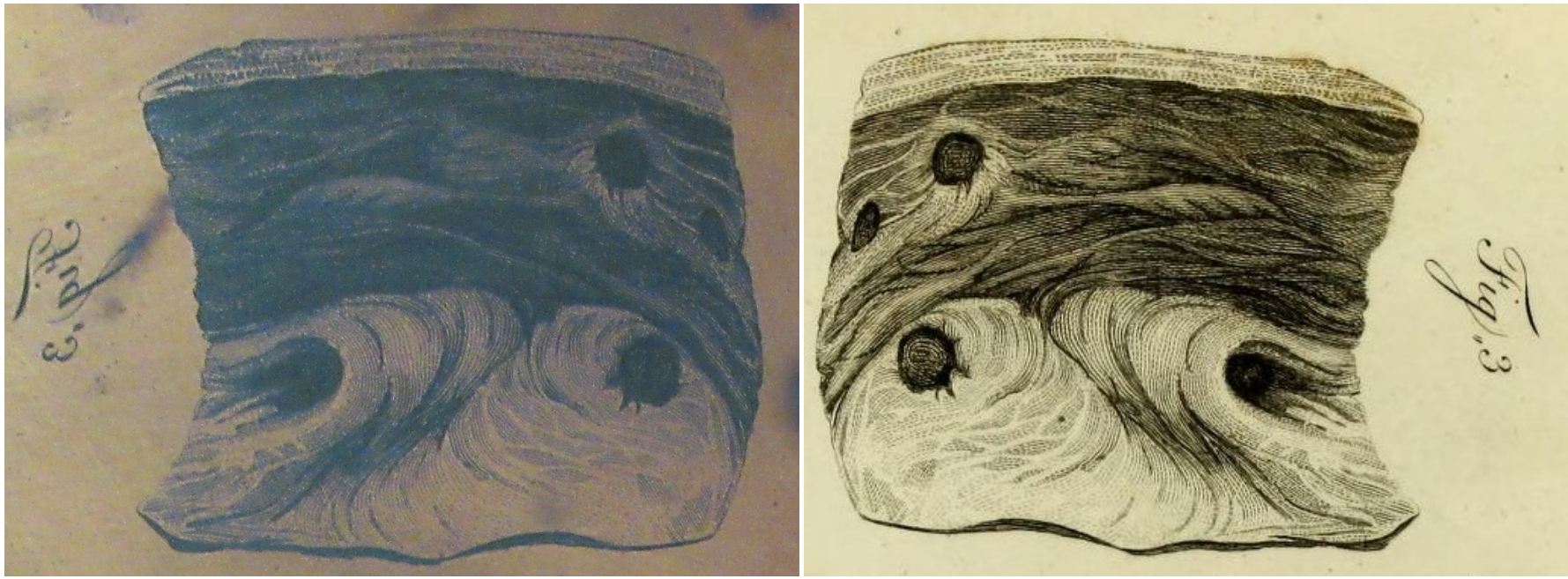

Figure 20: Enlarged view of copperplate and printed image of "a small portion of the urinary bladder, viewed upon its inner surface, exhibiting four small pouches which had contained calculi". James Basire II, copperplate engraving, MS103A Royal College of Physicians Archive; Matthew Baillie, Fasciculus 7, Plate II, Figure 3, *A Series of Engravings* 1799–1802.

This process in some senses stands apart from the close collaboration of Clift and Baillie. Skelton, Basire II, and Heath produced plates that bear little sign of their individual talents, being paid precisely to be faithful to the watercolours. However, it is important to emphasise that the plates were the main purpose of the book with all of the work put into *A Series of Engravings* revolving around them. The separate working conditions in comparison to regular relief printing that copperplate printing entail was incorporated into the conception of the work—as the search for the engravers (discussed above) shows, and the format of the book emphasises. The illustrations were designed to be printed in a folio format, so the written parts of the work had to be printed as such so that when the two were bound they fitted together. Whilst much of this work was standard and standardised for natural philosophical books by the end of the eighteenth century, the print process remained a collaborative one. Figure 21 shows that Baillie intervened at a late point in the printing process in order to improve his plates. The brown watercolour (the same figure as in Figure 20) has clearly been pasted onto a proof print at a later point. The late addition to the plate made the original design of the plate by Clift appear uneven. As the first two figures on the plate had already been engraved, there was no opportunity to redesign the plate without creating a new plate, which would create further work and expense. The additional figure was a preparation from William Hunter's collection, and we might speculate that Baillie was reminded of this preparation whilst he worked with the collection. This addition not only required a new watercolour, but the copperplate to be sent back to the engraver. It might even have required Bulmer to reprint parts of the text. Even after the engraving stage, Baillie was able to modify and improve his work.

Figure 21: Additional watercolour (brown, showing "a small portion of the urinary bladder, viewed upon its inner surface, exhibiting four small pouches which had contained calculi".) inserted onto proof print then engraved and printed. William Clift, watercolour of the same, MS103 Royal College of Physicians Archive; James Basire II, copperplate engraving, MS103A Royal College of Physicians Archive; Matthew Baillie, Fasciculus 7, Plate II, Figure 3, *A Series of Engravings* 1799–1802.

4.4: Conclusion

Baillie's *A Series of Engravings* sold well. The price of twelve shillings per plate was not cheap, but the illustrations were serialised, helping less well-off purchasers to spread their payments. Initially the plates were sold as they were printed. An account book in the Royal College of Surgeons archives shows that the booksellers who had sold the first two editions of *Morbid Anatomy,* Joseph Johnson and "Mr Nicol" (probably George Nicol), bought respectively at least 150 and 50 and up to 190 and 80 copies of each fasciculus before the publication of a collected edition in 1803.[540] The account book shows that these were purchased piecemeal, with orders presumably matching the fluctuations of demand and capital that the two booksellers had at their disposal, as well as the physical need to print more copies. For example, on 13th August 1799 Johnson received 100 copies of the latest fasciculus (the second). He received his next order of 50 copies the very next day—the second order presumably being printed on the 14th August. Yet for the third fasciculus Johnson only ordered 30 copies (on the 28th February 1800), though this was rectified a few days later when he received a further 80 copies.[541] In the latter case, the uncertainties of the bookselling business are surely to blame as Johnson was probably lacking in capital, or perhaps uncertain of demand.[542] Yet the willingness of booksellers to purchase expensive plates—each fasciculus was twice the price of the *Morbid Anatomy*—indicates that they were an investment worth making. Baillie's engravings were bought, and his was work seen.

As I have argued in this chapter, that work was continuous with his aim in *Morbid Anatomy* of making the study of disease anatomical (see Chapter 3). Illustrations were another way in which prospective morbid anatomists might be 'persuaded' to take up Baillie's project.[543] Baillie presented his illustrations as trustworthy representations of diseased appearances. In Daston and Galison's terms they 'characterised' disease. In that regard, Baillie's work was a success. The *Annual Review* employed Baillie's language in describing the plates, thereby characterising the illustrations as demonstrating diseased appearances unproblematically. For example, they state that "The second plate [of Fasciculus IX] represents a scirrhous enlargement of the uterus", which in *A Series of Engravings,* Baillie introduced the

[540] A second edition of the collected engravings appeared in 1812. See: Crainz 1982, 448-449. Baillie *Miscellaneous Papers*, 1739–nineteenth century.
[541] Baillie *Miscellaneous Papers*, 1739–nineteenth century.
[542] For a further example see: Zachs 1998.
[543] This was one of the purposes of botanical illustration. See: Secord 2002, 28-57.

plate thus: “This Plate is intended to illustrate a scirrhous enlargement of the uterus”.[544] Baillie’s illustrations were seen as directly representing nature.

But as we saw, the rhetoric was reliant on the work of a range of artisans, who translated the ostensive function of the work—to point to morbid anatomy in single preparations—into a range of mediums using different materials and techniques. These were designed to ensure that the illustration was faithful to the ‘Idea’ in nature identified by the anatomist and draughtsman. It was not a process of simply copying nature in an unmediated manner. Therefore, Clift used watercolours and enhanced the diseased appearances, whilst the engravers used techniques like crosshatching and ensured that the appearances were clear in the final printed image. These processes were accepted by contemporaries as being true to nature through the rhetoric of truth-to-nature embodied in the skills of natural philosophers and artisans.

[544] Aikin (ed.) 1802, 847; Baillie 1799–1803, 187.

Chapter 5: British Morbid Anatomy in the Nineteenth Century

In his 1833 work, *Outlines of Physiology and Pathology,* the Edinburgh physician William Pulteney Alison summarised recent work in pathology in Britain as consisting almost entirely of morbid anatomy, and complained of the terminological slippage related to it:

> I am aware that the term Pathology has of late years been much employed in this country in a more restricted sense, as nearly synonymous with Morbid Anatomy; and that what were formerly called Morbid Appearances, left after any disease, are now frequently (although with little attention to etymology), termed Pathological Appearances.[545]

Alison thus identified morbid anatomy as an approach to the study of disease particular to Britain that overshadowed other ways of studying disease in the country. In this chapter, I argue that morbid anatomy was indeed a practice distinct to Britain in the early nineteenth century, for which Baillie's work was crucially important. Morbid anatomy developed concurrently with the 'birth of the clinic' in Paris, and constituted a native practice that was specifically concerned with the study and description of the lesions found at post-mortem by physicians and surgeons. This was an anatomical approach to the study of disease, and therefore was tied to the practice of anatomy in the period. As Carin Berkowitz has argued, anatomy was central to conservative reform efforts in British medicine as it offered a point of pedagogical unity between physicians and surgeons, being important to both.[546] I extend this characterisation to include morbid anatomy, which was incorporated in anatomical teaching, and in doing so put forward a major new interpretation of the study of disease in the nineteenth century.

At the same time as the developments in Paris, British medicine developed a separate anatomical approach to the study of disease that worked to support its existing institutional structures (such as the royal colleges) whilst offering a point of pedagogical convergence between the separate practices of physic and surgery that could potentially differentiate diseases into those best treated by medicine or surgical intervention. Baillie's work played a central role in the development of this practice, as his flexible work was used and extended by physicians and surgeons alike in their own works, which turned attention to the description and representation of the textures and structures of the body. Following his example, illustrations of diseased parts (typically preparations) came to be seen as vital in the presentation of disease in books, and the number of diseased appearances that were illustrated greatly increased.

[545] Alison 1833, iv. On Alison see: Jacyna 2004.
[546] Berkowitz 2015a.

Related to this was the incorporation of morbid anatomy within anatomy curricula and the collecting of morbid anatomy preparations. This collecting formed the central material basis for medical museums in a period during which they expanded greatly due to the gradual institutionalisation of anatomical teaching within universities and hospitals.[547] Morbid anatomy thus came to be embedded within the teaching and practice of British medicine in the early nineteenth century.

This argument provides a major new narrative in the history of pathology, that helps in understanding the reluctance of many British practitioners to take on French medical reforms in Britain during this period. In his influential survey of British, especially English, 'pathology' in the early nineteenth century, Russell Maulitz argued that the discipline developed a national and nationalistic character that was defended by conservatives against the advances of more radical reformers who advocated the French 'pathology' as superior.[548] Maulitz—whose account of British 'pathology' in this period remains the standard—presents these conservatives as essentially devoid of innovation, resisting what they did not understand in an attempt to maintain the hierarchical status quo. In a key passage Maulitz outlines the disparity in attitudes between British and French practitioners regarding the dissection of diseased cadavers. Maulitz explains that for the British in contrast to the French, "The elaboration of a cogent pathological system was not part of the program". This meant that, unlike the French, their dissectors were not methodical and their work "thus, like a suite of rooms with no view, morbid anatomy without pathology".[549] Maulitz's characterisation of British 'pathology' in the early nineteenth century is then, a negative one—a practice of dissection that was unable to see the wood for the trees.

By contrast, I present a positive characterisation of the same, arguing that British practitioners were fundamentally concerned with a different wood to their French counterparts which provides a better explanation for the reluctance to take up French pathology in Britain than simple stubbornness. This builds on Berkowitz's argument that anatomy played a central role in what she terms the 'conservative reform movement' in Britain in this period. She argues that active efforts were made to reform medicine across political divides, articulated in new medical journals, with debate centred on what form reform ought to take.[550] Anatomy was seen by conservative advocates as bridging the divide between physicians and surgeons through

[547] Alberti 2011.
[548] Maulitz 1987, 109-223.
[549] Ibid., 139.
[550] Berkowitz 2015a, 76-102.

anatomical education in a way that maintained traditional institutional structures.[551] Berkowitz emphasises that British anatomy was seen by its advocates as being "practical" in a way that was of direct benefit for the surgeon-apothecary *or* the clinic.[552] The same was true for the British study of disease in this period as it was incorporated into anatomy. Morbid anatomy was thus a further point of unity between physicians and surgeons that allowed British practitioners to maintain a relatively unified investigation into disease at institutions like the newly-formed Medico-Chirurgical Society, whilst maintaining the role of the royal colleges. As a result, the practice of morbid anatomy provided good reasons for British practitioners to defend their native practices against the importation of French pathology with its implied institutional and structural change.

Baillie played a significant role in fostering British morbid anatomy, both through his publications and his personal involvement in London medical society, where he was now prominent. After Baillie's retirement from his near twenty-year career teaching anatomy at Great Windmill Street as one of its lead proprietors, he continued to play an active role in London medical society through personal engagement and publication. He had had a stellar career up to this point, obtaining a hospital appointment and fellowships of the Royal Society and Royal College of Physicians, alongside his publishing and teaching work.[553] In 1798 he was given David Pitcairn's practice, due to Pitcairn's failing health. This quickly demanded his full attention, leading to his retirement from teaching in 1799. After this point, Baillie continued his work on *A series of engravings*, finishing it in 1802, and published three further editions of *Morbid Anatomy* (1807, 1812, 1818), and a second edition of his illustrations in 1812.[554] At the same time, Baillie maintained his attendance at the Society for the Improvement of Medical and Chirurgical Knowledge and the Royal College of Physicians, publishing several more papers in the transactions of each.[555] In 1805 he became a founder member of the Medical

[551] Lawrence emphasises the role of hospitals in bridging the gap between physic and surgery in the same period, which was likely also a contributing factor (though by itself underdetermined). Lawrence 1996, 25.
[552] Berkowitz 2015a, 92-94.
[553] After his education at Hunter's school and Oxford and a brief tour of the continent, he was elected Physician to St George's Hospital (1787). He published papers in the *Philosophical Transactions* which helped him to become a Fellow of the Royal Society in 1790. In the same year he passed the exam to be made a Fellow of the Royal College of Medicine. At these societies he gave the Gulstonian Lecture (1794), Croonian Lectures (1796-1798), and the Harveian Oration (1798). All biographical details listed here are from Crainz 1995.
[554] The first two editions of *Morbid Anatomy* were published in 1793 and 1797 respectively. The first edition was translated into German in 1794 (see Chapter 3). Baillie began the process of making *A series of engravings* in 1798 (see Chapter 4).
[555] He had been an active member of the societies throughout the 1790s. See Chapter 3.

and Chirurgical Society of London (now Royal Society of Medicine) and was its President 1808–1810.

Abroad, Baillie was well-known in large part due to his publications. American editions of Baillie's works were published in 1795, 1808, and 1820 that mirrored the latest version in England. Translations into French (1803, 1815), Italian (1807, 1808, 1819), and further translations into German (1803, 1805) appear to have done the same. His fame was such that he was made an honorary member of a number of foreign societies.[556] At home, Baillie's career in private practice peaked with his appointment as Physician Extraordinary to George III in 1810 and Physician-in-Ordinary to Princess Charlotte in 1814. He earnt a fortune. In his final years, Baillie spent an increasing amount of time at his country residence at Duntisbourne near Cirencester where he died in 1823. After his death, friends erected a monument to Baillie at Westminster Abbey at the cost of 800 guineas.[557] Further editions of *Morbid Anatomy* were published (1825, 1830 twice, 1833 twice) with a Russian translation of the fifth edition published in 1826. Finally, his collected works were published by James Wardrop in 1825, which was translated into German twice (1829, 1838), alongside a work of his lectures printed in 1825, again translated into German twice (1827, 1839)—all by different translators. It is little wonder that his career—successful both in the practice and science of physic—was held up in the nineteenth century as exemplary.[558]

At the same time that Baillie rose to the top of the profession, there was a precipitous increase in the use of the term 'morbid anatomy' both as a descriptor of individuals' practice, and of purpose in the works of medical practitioners. The term, invented by John Hunter and effectively promoted by Baillie as indicative of a specific approach to the study of disease, began appearing in the articles of periodical publications, then book titles, and lastly in the job titles of medical educators.[559] It is useful here to distinguish the British pursuit of morbid anatomy from pathological anatomy. Pathological anatomy as a term implies a relation to pathology that the British practice did not necessarily have—that is, a relation to attempts at providing an overarching theoretical framework that was present, for instance, in France, for

[556] Baillie was: Fellow of the Royal Society of Edinburgh 1799, Honorary Fellow of the Royal College of Physicians of Edinburgh 1809, *Socius Extraneus Activus* of the Medical Society of Erlangen, Bavaria 1814, Honorary Member of the Veterinary College 1804, Honorary Member of the Medico-Botanical Society 1823. He was also, a member of the Anatomical Society 1821, and possibly an Honorary Member of the Medical Society of Bonn. Crainz 1995, 13-14.
[557] Munk 2004.
[558] Nenadic 2010, 509-527.
[559] Keel makes the claim that John Hunter invented the term: Keel 1998, 121.

which the use of the terms pathology and pathological anatomy are more appropriate and reflects contemporaries' use of the terms. British morbid anatomy was far more practically orientated around the day-to-day work of physicians and surgeons. Naturally, this did, at times, include theoretical work, but this was surprisingly piecemeal even as French pathology and pathological anatomy began to influence British practitioners. In place of a British 'pathology', as Maulitz characterises it, it is therefore more appropriate to discuss the development of morbid anatomy in Britain as a separate practice from the pathology of France. This practice was one that was simultaneously independent but yet connected to developments on the continent, as a number of scholars, including Maulitz, have identified.[560]

This chapter is split into three sections that together aim at providing an outline of British morbid anatomy in the early nineteenth century. This is not a comprehensive overview of the subject—it is far too large a topic to sufficiently cover within the scope of a thesis on the work of Matthew Baillie. However, in providing this overview I move away in parts from focusing on Baillie and his work, to a more general examination of morbid anatomy in this period. I do so for two related reasons that stem from my historiographical approach. First, I have attempted throughout the thesis to elucidate the interactions between publication and practice. By being more inclusive in the range of projects and publications covered in this chapter, I demonstrate the applicability and flexibility of a certain type of practice—here morbid anatomy—across heterogenous works. I argue that this suggests that at a time when a strong theoretical framework for the study of disease did not exist, working practices unified practitioners and displaced the requirement for a theoretical framework, despite that being so central to French pathology at the same time.[561] Secondly, the variety of projects for which morbid anatomy (and *Morbid Anatomy*) was relevant demonstrates that publication was only the beginning of that work's epistemic content being imparted. The literary scholar Wolfgang Iser argued that a literary work has two poles, an artistic and aesthetic, "the artistic pole is the author's text, and the aesthetic is the realization accomplished by the reader".[562] Where I have focused on explaining Baillie's work in previous chapters, here I focus on its reception, what the community of readers 'realised' from the work.

[560] Maulitz 1987. See also: Keel 1998, 117-183; Bertoloni Meli 2017.
[561] As John Pickstone argued, there is a difference between 'ways of working' and 'ways of knowing', with the latter relying on the former. I argue here that it does not necessarily follow that the latter is overtly theoretical. Pickstone 2007, 489–516.
[562] Iser 2006, 391.

The first section focuses on the incorporation of *Morbid Anatomy* into other works on physic and surgery concerned with disease. Baillie's book became an important reference work for others, and in doing so promoted the practice of morbid anatomy. This was an empirical study of the lesions found at post-mortem, producing generalised knowledge about diseased appearances, enabling the contrast and comparison of further findings with each other to take place. In using and extending Baillie's work, readers were encouraged by the work's flexibility: not only did it cover most of the internal organs, it was circumspect regarding pathological theorising, which allowed the work to be widely applicable to a variety of different projects. As a result, some of Baillie's descriptions came to be canonical, as I show in relation to diseased appearances related to croup in the period. Through this process, morbid anatomy was normalised as an approach within British medicine that applied to both the practice of physic and surgery, and might act as a way of differentiating the treatment of patients between them. Furthermore, it gained an institutional basis at the Medico-Chirurgical Society, which supported such investigation through its *Transactions.*

In section 5.2 I examine the spate of works of 'morbid anatomy' published in the early nineteenth century, focusing in particular on Alexander Monro tertius's *The Morbid Anatomy of the Human Gullet, Stomach, and Intestines* (Edinburgh 1811). Authors writing on morbid anatomy employed and extended the features of Baillie's publications for their own works, and thereby employed and extended the features of the instructional anatomical description. Most significant in this regard was the increase in the number of illustrations of diseased parts in works on disease, as such images came to be seen as vital for the presentation of certain appearances ahead of a reliance on text-only description. This was partly enabled by new printing techniques and the expansion of print in the early nineteenth century, but it was also encouraged by the presentation of disease as an anatomical—and thereby potentially representable—subject by Baillie. In his own work, Baillie had emphasised the difficulty of representing all diseased appearances through line engraving. Taking this on board, authors experimented with a wide variety of different techniques and technologies of printing in order to render the texture and structure of the body accurately. This experimentation was, I argue, encouraged by the increasing use of colour printing for representations of disease, as the possibilities of various representational technologies and strategies were sounded out in the early years of the nineteenth century.

The third section briefly outlines the integration of morbid anatomy with anatomical pedagogy through the use of three examples. Charles Bell's anatomical teaching at Great

Windmill Street demonstrates that anatomical teachers followed Baillie's example by incorporating lectures on morbid anatomy into their courses. Such integration was used rhetorically by John Richard Farre as a way of promoting a British alternative to Parisian style clinical teaching. He promoted morbid anatomy as a unifying point for the teaching of physic and surgery that maintained the traditional hierarchies of the royal colleges. Finally, the work of Frederick John Knox demonstrates that the expansion of medical museums in the early nineteenth century was in large part due to morbid anatomy—teaching morbid anatomy necessitated lots of preparations of diseased appearances. His guide on creating medical museums therefore contained an extensive discussion of making preparations of disease that appropriately represented the anatomical information. This embodied a generation's engagement with diseased appearances through the use of preparatory techniques, the creation of collections, and the pursuit of morbid anatomy.

5.1: The Uses of *Morbid Anatomy* in Works on Physic and Surgery

Baillie's *Morbid Anatomy* was read by many of his British contemporaries and parts were incorporated into their own works on physic and surgery. Through this process, not only did the work become a key reference point for books concerned with the study of disease throughout the early nineteenth century, but the practice of morbid anatomy was also promoted. Primarily, the new practice entailed an empirical study of the lesions found at post-mortem focused around their careful study and differentiation.[563] Such study was relevant both to physicians concerned with case histories and to surgeons concerned with localisation—Baillie's work a useful resource for both. In this section, I examine the use of his work across a range of publications by physicians and surgeons. Baillie's *Morbid Anatomy* was quickly accepted as an authoritative source by physicians working on disease who used it in a number of ways: as a source of anatomical information, but also of symptoms and cases, for example, further encouraged after the publication of the second edition of Baillie's work.

These uses stemmed from the work's flexibility. Not only did it cover most of the internal organs, due to Baillie's focus on structure ahead of theorising on disease, it was open to being utilised for various intellectual projects. This encouraged practitioners to focus on the textures and structures of the body in their own work. Due to this, some of Baillie's descriptions

[563] Bertoloni Meli makes a helpful comparison between Bichat and Baillie in this regard, arguing that "While Bichat sought to frame disease within the rigid grid of tissue localization, Baillie focused on the differences among lesions in a more empirical fashion that was not rigidly anchored to tissues." Bertoloni Meli 2017, 7-8.

became canonical, as I show in relation to his description of diseased appearances related to croup. Furthermore, Baillie's work was taken up by surgeons, which facilitated the reconceptualisation of the practice of post-mortem dissection as primarily anatomical, rather than primarily related to case histories. This worked to normalise morbid anatomy as the basis for physic and surgery, its procedures becoming central to both. Morbid anatomy was thus a unifying feature of British medicine at a time when historians have typically emphasised disunity due to the influence of self-interested institutions. Indeed, morbid anatomy gained its own institution in the Medico-Chirurgical Society, which helped to delineate a distinctive set of priorities for the practice of morbid anatomy at the same time as the developments in Paris were gradually being imported into Britain.[564]

After its initial publication in 1793, Baillie's work almost immediately became a key point of reference for other British physicians writing on disease. In William Davidson's *Observations, Anatomical, Physiological and Pathological, on the Pulmonary System* (London 1795) he remarked:

> I have endeavoured to give a general idea of the seat, origin and formation of tubercle: but, for a more minute account […], together with the different other appearances they assume, I beg leave to refer the reader to the following pathological authors, viz. Morgagni, Dr. Stark, my learned and ingenious friend Dr. Baillie and others.[565]

Immediately then, Baillie was placed in the company of the most significant 'pathological authors' of the time by his contemporaries. James Johnstone, in his 1795 work on the nervous system, listed these as: "*Bonetus*, and the later anatomical collections of *Morgagni, Lieutand,* Dr. *Baillie,* and others".[566] Robert John Thornton's 1797 *Medical Extracts* canonised Baillie's work in the long tradition of pathological anatomy thus: "The examination of dead bodies, in the immense collections of BONETUS, MORGAGNI, LIEUTAND, and in a late work by the ingenious and indefatigable Dr. BAILLIE, furnishes ample evidence how frequently indeed fatal diseases are formed in the vital organs, and in the abdominal viscera".[567] Why was Baillie's work so swiftly placed alongside these authors? There were two main reasons: the flexibility of the work that allowed it to be a practical resource for a wide variety of projects, and the authority that Baillie's descriptions gave to others' work.

[564] Baillie was also influential abroad, including in France. An example can be found in: Bertoloni Meli 2017, 81-106.
[565] Davidson 1795, 120-121.
[566] Johnstone 1795, 69-70 author's emphasis.
[567] Thornton 1797, xiii.

The flexibility of Baillie's work stemmed from its relative comprehensiveness—it covered most of the body, discussing several appearances per part—and Baillie's circumspection in providing any kind of theoretical framework in which disease ought to be understood. In the theoretical debates of the day, Baillie was in essence somewhat neutral, and could thus be used to support a variety of different arguments in different ways. Most simply, it was used as a further resource or example that worked to enhance the author's work. For instance, the second edition of William Saunders's 1795 treatise on diseases of the liver encouraged readers to consult Baillie's work for "a more particular account of the diseased structure of the liver" than he had provided.[568]

Baillie's work could also be made to contribute cases. Robert Bree's *A Practical Inquiry on Disordered Respiration; Distinguishing Convulsive Asthma, its Specific Causes, and Proper Indications of Cure* (Birmingham 1797) used Baillie's work both as a source of reference for morbid anatomy descriptions, and as a source for a case in the same manner that Bree had cited Bonet's and Morgagni's works.[569] Bree chose "some select cases, which, whatever name may have been imposed upon them, are, in my opinion, evidently instances of Spasmodic Asthma", beginning with what Baillie described as "Lungs incapable of collapsing". Baillie himself did not claim that this appearance was the result of spasmodic asthma; rather Bree recast Baillie's description of a diseased appearance as a case. This was possible due to Baillie including minor narrative elements in the description ("In opening into the chest", "When examined"), and a brief discussion of symptoms ("This is not uncommonly the case in persons who have laboured for some considerable time with difficulty of breathing, but without any symptoms of inflammation"), after the description of the morbid appearances ("the lungs do not collapse, but that they fill up the cavity completely on each side of the heart" and so on).[570] The descriptions in *Morbid Anatomy* were thus a resource that could be modified for other authors' purposes.

Such usage of *Morbid Anatomy* continued and expanded in scope after the publication of new editions. The inclusion of generalised descriptions of symptoms to complement those of diseased appearances from the second edition onwards (which were also published separately in *An Appendix to the First Edition of the Morbid Anatomy of Some of the Most Important Parts of the Human Body,* London 1798) encouraged such flexible use of the work.

[568] Saunders 1795, 211.
[569] For example: Bree 1797, 40, 42, 46.
[570] Bree 1797, 123-124; Baillie 1793a, xv, 50-51.

Manchester-based physician John Hull, for one, was simply interested in what Baillie had published on symptoms attending to inflammation of the peritoneum: "A short account of the symptoms, I find has been given in the Appendix to Baillie's Morbid Anatomy, page 48 and 49".[571] Richard Powell's 1800 Gulstonian lecture used Baillie's new edition as a way of expanding the scope of his research abroad: "Dr. Soemmering [the first translator of Baillie's work, see Chapter 3] has seen a good many instances of ulceration in the inner surface of the gall bladder, from the irritation of gall stones. *Baillie's Appendix to Morbid Anatomy*, p.80".[572] Alexander Monro tertius, meanwhile, made a more straightforward and comprehensive use of Baillie's second edition. In his work, *The Morbid Anatomy of the Human Gullet, Stomach, and Intestines* (Edinburgh 1811), which we will examine in further detail in the next section, Baillie's second edition was a key reference for a variety of diseased appearances, such as calculi stones in the stomach and a fungus of the pharynx.[573] Monro also liberally quoted Baillie's descriptions (for example, of scirrhous tumours of the stomach), and included some of Baillie's comments relating to his observations (for example on the use of the pulse in ascertaining a protruding intestine).[574] Monro even ascribed a specific appearance to Baillie, the "Projecting Ring of Dr Baillie" which was formed in the cavity of the jejunum in the small intestine.[575] *Morbid Anatomy* was thus used for a wide variety of purposes across a range of differently motivated works. Particularly notable in this small sample is the very different medical projects that the work was used for. This can be seen both in terms of the body parts concerned—work on the liver, lungs, peritoneum, gall bladder, stomach, and intestines were all relevant to *Morbid Anatomy*—and the motivating concerns of the authors in using Baillie's work: Bree used Baillie to provide more cases of asthma in his discussion of a particular disease, Hull to improve his discussion of symptoms relating to a particular type of morbid appearance, and Monro as an anatomical authority for his discussion of diseases relating to the digestive system. Baillie's work formed a basis for works that spanned various types of investigation into disease.

One unusual use of Baillie was as a test of therapeutic theory. James Mills's *The Morbid Anatomy of the Brain, in Typhous or Brain-Fever* (Dublin 1818) promoted the use of venesection and evacuants as the best remedies for typhus through appealing "to a test" of the

[571] Hull 1800, 288.
[572] Powell 1800, 88.
[573] Monro tertius 1811, 29, 197.
[574] Ibid., 324, 395.
[575] Ibid., 110, 147.

practice through examining the morbid appearances in such cases. This explicitly followed "Doctor Baillie, in his Morbid Anatomy" and was "calculated *to correct theories too hastily taken up about diseases*".[576] The short work then examined twelve cases with post-mortem examinations that enabled Mills to give a clear idea of what the complaint consisted of and what morbid appearances attended it. Ultimately, his therapeutic approach was justified on the grounds that the vessels in the head were already "overgorged", so would be overwhelmed by any other approach.[577]

A more common use of Baillie's work by physicians was as a specific anatomical grounding that enabled theoretical points to be proven. Sayer Walker's *A Treatise on Nervous Diseases* (London 1796) imported Baillie's descriptions into his own work in their entirety. This aided the comprehensiveness of his account, and allowed him to reason upon Baillie's observations. For Walker, Baillie's discussion of diseased appearances of the brain and nerves allowed him to conclude, "Facts of this [Baillie's] kind, together with reasonings founded on other circumstances, have led some anatomists and particularly Dr. Monro, to conclude not only that nerves may exist without a brain, but that their energy and influence are less dependent upon it than has generally been supposed".[578] Walker thus linked Baillie's generalised descriptions to the physiological theories of Monro (likely tertius) in order to strengthen the latter's case, overall making a physiological argument that was relevant to the medical understanding of nervous disorders. Reference to Baillie might also weaken a case. Caleb Hillier Parry used such a reference to *Morbid Anatomy* in his 1799 work on syncope anginosa. In his efforts to establish whether "the organic injury" of "ossified coronaries" was the cause or the effect of "Angina Pectoris", he cited Fothergill and Black as having described such appearances, but Lieutaud and Baillie as having not. Parry then used this disparity in order to suggest that John Bell's assertion that it was *not* organic might be true—an assertion that he then found to be false over the subsequent pages.[579] Here Parry used the authority of Baillie's work in order to weaken his own position before proving it, strengthening the overall rhetorical impact of his point. Once again, reference to diseased appearances (here with a much wider scope than just Baillie's work) worked to help prove a theoretical point. And in each case, Baillie's descriptions were authoritative for physicians—able to be used to ground theories in "Facts", as Walker termed it.

[576] Mills 1818, 3 author's emphasis.
[577] Ibid., 24-25.
[578] Walker 1796, 9-10.
[579] Parry 1799, 107-109.

At the same time, Baillie's work encouraged practitioners to engage with the textures of the diseased body found at post-mortem themselves, including those who found Baillie's work lacking in other respects. James Hamilton, whom we met in Chapter 3, saw Baillie's work as insufficient as it did not consider cases, and tried to revivify Morgagni's work by systematically reconstituting his case histories in order to make it easier for the practitioner to obtain the relevant "facts" from them.[580] But even he referenced Baillie, and built on his work by adding his own descriptions of the textures he had encountered in his practice. In regard to the diseased appearances of the absorbent glands of the mesentery, for example, Hamilton concurred with Baillie that "sometimes they contain pus, mixed with a white soft curdly matter".[581] But furthermore, Hamilton added: "sometimes, on the contrary, they are quite soft and flabby", whereas Baillie had described them when scrofulous as "enlarged in their size, and are softer to the touch, than in a natural state".[582] Baillie's work was built on and extended by his contemporaries paying close attention to the texture of morbid appearances.

But Baillie's descriptions were not only confined to singular uses in individual books. Instead they became standard descriptions for morbid appearances and diseases across a range of works. Taking the example of a specific disease, here croup, we can see how Baillie's descriptions of diseased textures percolated throughout a series of works across different forms and formats at the turn of the eighteenth century. In the first edition of *Morbid Anatomy*, the relevant appearance was described: "When the inner membrane of the trachea is inflamed, it is sometimes lined with a layer of a yellowish pulpy matter". This was specifically linked by Baillie to "patients who have died from the croup".[583] Soon after publication, Disney Alexander used Baillie's description in his own work, *A Treatise on the Nature and Cure of the Cynanche Trachealis Commonly Called the Croup* (Huddersfield 1794), as Alexander was himself unable to provide one because, in his words, "neither did any other appearance of disease present itself to our inspection".[584] In William Davison's 1795 work on the same subject, post-mortem findings were described as: "the croup, when attended with that membranous or pulpy substance, sufficiently described by authors".[585] John Yelloly similarly described a "yellowish and pulpy material" found on the inside walls of the trachea and bronchial tubes in his work on

[580] Hamilton 1795, x-xi.
[581] Hamilton 1795, 154. Baillie describes: "more frequently they are changed, in part, into a white, soft, curdly matter, and this is not uncommonly mixed with pus", Baillie 1793a, 134.
[582] Hamilton 1795, 154; Baillie 1793a, 133.
[583] Baillie 1793a, 56-57.
[584] Alexander 1794, 39.
[585] Davidson 1795, 102.

the croup in 1796.[586] Such descriptions appear to have stemmed directly from Baillie. A search of Eighteenth-Century Collections Online (ECCO) for the terms 'croup' and 'pulpy' appearing together for the period 1700 to 1800 brought up no relevant results before Baillie's publication.[587] After 1793 the description of croup as causing a 'yellowish pulpy matter' or similar appeared explicitly in four works before 1800, and was referenced in another.[588]

After Baillie's publication medical authors began to see the morbid appearances related to croup in the same way—a membranous substance that was pulpy and yellow left in the trachea. Baillie's description had thus become canonical and continued to be used in the nineteenth century. For example, it appeared in the first volume of the 1808 *London Medical Review*, further indicating its place as the standard description of the morbid appearance.[589] By this time, the description had been extended in its explanatory scope by being made visible in print. The surgeon and physician John Cheyne published colour illustrations of the appearance in his work *Essays on the Diseases of Children: with Cases and Dissections* (Edinburgh 1802). Alongside his discussion of croup and examples from his cases, Cheyne provided stipple engraved plates that were hand-coloured after printing. Similar to how Baillie presented his illustrations (see Chapter 4), Cheyne argued that these plates were sufficient explanations of the morbid anatomy: "In the body of the Essay, however, I have not dwelt much on the morbid appearances, because I am sensible that the Engravings which accompany the cases will explain those appearances more accurately than the most laboured or lucid description".[590]

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[586] "Internæ parietes tracheæ, æque ac bronchiorum, plerumque obducuntur concretione tubulata, vel lamina materiæ flavescentis et pulposæ". Yelloly 1796, 12 translation mine.
[587] Both terms were used prior to Baillie's work. In *London Medical Journal, By a Society of Physicians* 1783, 46-47 there is a case of schirrus of the oesophagus that is accompanied with a liver of "pulpy consistence". George Motherby's *A New Medical Dictionary* also uses the term 'pulpy' to describe hydatids (Motherby 1791, 420). 'Croup' was in common usage
[588] Alexander 1794, 39; Davidson 1795, 102; Yelloly 1796, 12; Nisbet 1796, 16. Also referenced in: Rumsey 1800, 32. From searching the *ECCO* catalogue, this appears to be every relevant work on the subject but one: the American John Archer's 1798 *An Inaugural Dissertation on Cynanche Trachealis, Commonly Called Croup or Hives*. The first American edition of Baillie's work was published in 1795 in Albany. Therefore, it is quite possible that Archer, who was in Philadelphia, had not encountered it. Archer 1798; Crainz 1995, 95. I omitted from this analysis works that either guides for the public, like William Buchan's *Domestic Medicine*, and therefore inappropriate places for such discussion, or works that were solely concerned with symptomatology and diagnosis, like C.W. Hufeland's paper 'Upon the Asthma acutum periodicum Milliari (the hives); and the Angina polyposa membranacea (the croup). A diagnostical fragment' published in the Edinburgh based periodical *Annals of Medicine* in 1799. Buchan 1799; Hufeland 1799, 30-40. Note, this was a translation from the German *Journal of Practical Medicine and Surgery*.
[589] The anonymous reviewer stated that Baillie was a "clear and intelligent author" directly before quoting the description. The page reference given indicates that they quoted Baillie's second edition. *London Medical Review* 1808, 251. John Howship also gave a similar account: Howship 1816, 148.
[590] Cheyne 1802, 5.

Cheyne's artist, the surgeon and anatomist Charles Bell (who would go on to be the proprietor of the Great Windmill Street school), received ample though anonymous credit in the introduction as: "a Gentleman well known to the medical world by his excellent anatomical works, who, to a masterly use of his pencil, joins the most consummate knowledge of Morbid Anatomy".[591] Nevertheless, the plates demonstrated Cheyne's experience during his own practice of dissection. This was represented by Cheyne in a strikingly similar way to Baillie's description of a 'yellow and pulpy membrane'. Plate 3 (Figure 22) was "intended to show the parts in their inflamed state" and showed the trachea layered with a yellow membrane towards the top, which Cheyne described as "tumefied and inflamed".[592] Cheyne's own description and representation of the appearance thus closely mirrored Baillie's. From a description based on Baillie's own experience of morbid anatomy, the diseased appearances attending to croup were subsequently canonised as a yellowish and pulpy membrane lining the trachea resulting from inflammation in text and image across a range of works by both physicians and surgeons.

[591] Cheyne 1802, 6. On Bell see Berkowitz 2015a. Cheyne did not mention his engravers.
[592] Cheyne 1802, 60 + plate III.

Figure 22: Inflamed trachea resulting from croup. The membrane is yellow as in Baillie's description. Hand-coloured stipple engraving: Charles Bell artist, Charles Stewart engraver. John Cheyne, Plate 3, *Essays on the Diseases of Children: with Cases and Dissections* 1802.

In the example of the diseased appearances attendant on croup, we can see the transfer of Baillie's descriptions of morbid anatomy into surgical works. This transfer was accompanied by a reconceptualisation of the practice of dissecting diseased cadavers as primarily anatomical, instead of being primarily related to case histories. In Chapter 3, we saw that Baillie made clear that his work was not one of cases, and that he promoted it as one of anatomy. At the turn of the century, 'morbid anatomy' as a practice related to anatomy began to be articulated by other authors. The result was that morbid anatomy became an important basis for both physic and surgery, just as anatomy was. For example, in 1799, surgeon Charles Brown wrote to the editors of the *Medical and Physical Journal* explaining that "Medical and chirurgical practitioners, from the time of Hippocrates to the present day, have ever considered the study of anatomy, as forming one of the most essential branches of their education". More recently, Brown explained, "Doctor Baillie has also added a rich store to our anatomical knowledge".[593] Similarly, the Leeds-based surgeon James Lucas, in his work *A Candid Inquiry into the*

[593] Brown 1799, 142-143.

Education, Qualifications, and Offices of a Surgeon-Apothecary (Bath 1800), listed Baillie's work as a subgenre of 'Anatomy' in his "alphabetical catalogue of Subjects with reference to Authors".[594] The theologian Samuel Miller perhaps captured it best in his *A Brief Retrospect of the Eighteenth Century […] Containing a Sketch of the Revolutions and Improvements in Science, Arts, and Literature during that Period* (London 1805), by explaining that "*Morbid dissections*" were "a new and interesting area in anatomy and medicine".[595]

This reconceptualisation had two main consequences in the study of disease in Britain: first, generalised descriptions of morbid appearances became the basis for both the medical and surgical study of disease, and secondly, as a result, the procedures of morbid anatomy were normalised in the practice of both. We have already seen that in physic, theoretical discussion of physiology came to be grounded in generalised descriptions of morbid anatomy. In surgery, discussions of local changes were similarly grounded. Thus, in the surgeon David Clark's work, *A Probationary Essay on the Morbid Anatomy of the Urinary Bladder* (Edinburgh 1818), descriptions of morbid appearances from both medical and surgical writers were placed alongside each other as important observations in understanding the general character of the urinary bladder in disease.[596] The surgeon John Howship was emphatic on why morbid anatomy was able to bridge the divide between the professions. It was of equal use to both, just as it was for anatomy:

> The importance of the study of Morbid Anatomy is such, that it may be compared with the Sun, which diffuses an equal and steady light over every path. The physician, the surgeon, and the anatomist, are all equally happy in being able to direct their steps by its assistance, and equally ready to acknowledge themselves indebted to this fertile source for the suggestion of most of the improvements that have ever taken place in the practice of their respective branches of their profession.[597]

Howship's work *Practical Observations in Surgery and Morbid Anatomy* (London 1816) therefore went beyond the direct scope of operative surgery, including material relevant to both physic and surgery. Indeed, the numerous cases around which the book was structured show that physicians and surgeons often worked together on cases. For example, in a case of paralysis resulting from injury to the spinal marrow a consultation was held between "Dr. Baillie, Dr. Pemberton, Mr. Heaviside, and Mr. Astley Cooper" to decide the course of treatment.[598] It was

[594] Lucas 1800, 110.
[595] Miller 1805, 274 author's emphasis.
[596] Clark quotes Baillie alongside Lieutaud and Howship, for example. Clark 1818, 46, 60.
[597] Howship 1816, vi-vii.
[598] Ibid., 115-118.

therefore relevant to all four men as to what the findings at post-mortem were, as that would give an indication of the best type of treatment in the future: medicine or surgery.

Historians examining British medicine in the early nineteenth century have typically emphasised the divisions in the practice that stemmed from hierarchical institutions that worked to the benefit of their elite members.[599] But in morbid anatomy, British approaches to the study of disease were unified behind a practice that had practical benefit for and could respect the traditional boundaries between physic and surgery. At the same time, this became institutionally expressed by the formation of the Medico-Chirurgical Society in 1805 (now the Royal Society of Medicine). The society was explicitly concerned with attempting to benefit the whole "medical profession".[600] In that regard, the society was explicit about its main purpose—to better understand disease: "The varied forms of disease, whether medical or surgical, and the modes of treatment which may be found adequate to their removal, are subjects concerning which the Society necessarily feels the highest interest".[601] It was of particular benefit to include both physicians and surgeons in the society as it afforded "a greater facility of obtaining accurate information on many points of practice, than could have been derived from a Society, composed of either physicians or surgeons alone".[602] Central to this exchange regarding disease was morbid anatomy—accounts of dissections and morbid findings formed a regular and central part of the society's first set of *Medico-Chirurgical Transactions* (London 1809). Related to this, Susan Lawrence has argued that the *Transactions* acted as an important outlet for non-clinical investigation into disease.[603]

Morbid anatomy was thus a key concern across the study of disease in Britain at the turn of the eighteenth century. In the early years of the nineteenth century, the British practice of morbid anatomy continued alongside the importation of French tissue pathology, which occurred especially after 1820.[604] This was due, in no small part, to the applicability of the practice to diverse projects in the study of disease. More significantly, the practical benefits of morbid anatomy were advantageous to both physic and surgery. Indeed, for conservative reformers, the continued pursuit of morbid anatomy offered a way forward for the 'profession' that allowed the demarcation between physic and surgery to be maintained. As James Wardrop,

[599] For example: Maulitz 1987; Alberti 2011.
[600] *Medico-Chirurgical Transactions* 1809, i.
[601] Ibid., iii.
[602] Ibid., v.
[603] Lawrence 1996, 277-278.
[604] On attempts at importing the French practice in the early nineteenth century see: Maulitz 1987.

a Scottish surgeon who published a number of Baillie's works posthumously, outlined in his collation of Baillie's works *The works of Matthew Baillie, M. D.: to which is Prefixed an Account of his Life, Collected from Authentic Sources*, the potential of morbid anatomy was that it might help to demarcate proper therapeutic boundaries between physic and surgery. Through morbid anatomical investigation, specific diseases could be properly differentiated by practitioners as best treated by medical or surgical means:

> The line of demarcation between the primary and secondary stages of specific diseases leads to some important practical conclusions; because it accurately points out those cases where local treatment can be expected to avail, and those where relief can only be obtained through the medium of the constitution.[605]

5.2: Publishing Morbid Anatomies in the Early Nineteenth Century

As Baillie's work became an important point of reference for practitioners, and the pursuit of morbid anatomy seen as a practical pursuit in the study of disease in the nineteenth century, a number of works of 'morbid anatomy' were published by medical authors that emulated and extended features of Baillie's work. Authors who described their books as 'morbid anatomy' aligned themselves with Baillie's project. In doing so, they employed Baillie's epistemic strategies in their own works, which included using features of the instructional anatomical description genre. The most significant development in the publication of works on disease as a result of this was the increase in the number of works on disease that were illustrated, which I focus on in this section. In part, this increase was enabled by the expansion of the book trade alongside technological developments in printing in the early nineteenth century, which saw a concomitant increase in the numbers of illustrations produced for works.[606] I argue that this proliferation of illustrated works on the subject of disease, was due to authors increasingly seeing the illustration of disease as necessary. In *A Series of Engravings* Baillie had effectively shown that the subject could be represented in the instructional anatomical genre; now practitioners used and modified important aspects of his work when representing disease in the early nineteenth century. Central in this regard was the representation of the internal structures and textures of the body through a variety of different printing techniques. Where Baillie had

[605] Wardrop 1825, xxviii.
[606] On the early nineteenth-century trade for scientific books see: Topham 2007, 135-168. On new technologies for printing in this period see: Griffiths 1996. On the use of these techniques for scientific publications see: Topham forthcoming; Topham 2000, 559-612.

observed that it was not possible to comprehensively represent all morbid appearances through line engraving, nineteenth-century practitioners now employed and experimented with a variety of old and new printing technologies and techniques in order to more fully render the variety of the diseased body in print.

In this regard, I concur with Bertoloni Meli's argument that what he terms 'illustrated pathological works' became more common after Baillie's publication, with many authors crediting Baillie as an important precursor. In addition, I agree with his observation that colour became increasingly important to such works in this period due to the epistemic prioritisation of colour by practitioners worked alongside improvements in colour printing technologies.[607] However, Bertoloni Meli's characterisation of the development of illustrations of disease in this period is fundamentally linear, which works to suggest a technological determinism in the representation of disease. In *Visualizing Disease,* he explores the "genre" of the "illustrated pathological treatises".[608] In doing so, he tracks the illustration of disease in books from the *Observationes* of early modern practitioners, through illustrated museum collections in the seventeenth and eighteenth centuries, to the systematic, full-colour treatises of Jean Cruveilheir in the nineteenth. Throughout he searches for representations of "pathological anatomy, the field that studies disease through the lesions found at postmortems".[609] This focus artificially unites all of the images that he examines as being of pathological anatomy, no matter their specific instantiation within works. Such backwards projection is ultimately anachronistic: the development of images of disease appears progressivist, going from early false starts to complex and comprehensive full-colour treatises.[610]

By contrast, I argue that the flurry of publications of illustrations of disease in this period was a new development linked directly to Baillie's use of the instructional anatomical description genre for his works. Though prior illustrations of disease were important to nineteenth-century authors, they were tied to the various, heterogenous approaches to the study of disease that I argued in Chapter 1 characterised the study of disease in the eighteenth century. Furthermore, I emphasise that the technological change that was vital to many of the new

[607] For example, Bertoloni Meli argues that this was the case for James Wardrop, Everard Home, and René Laennec. Bertoloni Meli 2017, 107-108.
[608] Ibid., xi.
[609] Ibid., 8.
[610] I suspect that Bertoloni Meli has conceived of 'pathological anatomy illustrations' like this because of the history of anatomical illustrations. However, their development was much more unified—related as it was to a successful discipline of anatomy (as Cunningham argues)—than illustrations of disease. In fact, the two are not analogous despite the clear parallels and interactions between anatomical works and illustrated works on diseased appearances.

developments in publishing illustrations of disease in the nineteenth century was an important but not determinant factor in shifting the illustration of disease towards colour. Through specifically examining the enormously varied illustrations in Alexander Monro tertius's *Morbid Anatomy of the Gullet, Stomach, and Intestines* (1811) I demonstrate that authors who represented disease had a surfeit of options available to them. Due to the dynamic and changing industry, Monro was able to employ different types of engraving for different styles of representation. For example, using stipple engraving enabled the schematic representation of parts with points of detail, united by the tonal quality of the print, whilst lithography created impressionistic images for different purposes. Colour was important for Monro, but due to the difficulty and expense colour printing entailed, it was used sparingly, only when necessary. Authors of nineteenth-century morbid anatomies thus had the same aim as Baillie—for their images to emphasise and embody structures and textures for the viewer—but a range of new possibilities for the realisation of that project. In the rest of this section, I expand on each of Bertoloni Meli's narratives in turn.

First, Bertoloni Meli specifically singles out James Wardrop, John Richard Farre, and Robert Hooper as receiving a 'cognitive inheritance' from Baillie's earlier focus on the structure and texture of lesions.[611] As he observes, this inheritance could be realised by individual actors in a fluid manner. Wardrop, for example, published *Essays on the Morbid Anatomy of the Human Eye* (Edinburgh 1808) then the next year (1809) a work on a particular disease that mainly affected the eye, fungus haematodes, moving from an organ-centred work to a disease-centred one. This reflected the wide flexibility Baillie's work afforded practitioners discussed in the previous section.[612]

Fundamentally, this inheritance was focused around the conception by practitioners that they were undertaking morbid anatomical work. James Wardrop's 1808 work *Essays on the Morbid Anatomy of the Human Eye* was one of the first books to use 'morbid anatomy' in its title after Baillie's work. The book opened with the submission that his work was an extension of Baillie's to a new body part.

> The object of the following essays is to describe the various morbid alterations in the structure of the human eye […]. In the accurate and detailed view which Dr Baillie has

[611] Bertoloni Meli 2017, 110, 158, 161.
[612] Ibid., 110.

> given of the morbid anatomy of some of the most important parts of the human body, he has not described the diseases of this organ.[613]

Wardrop's publication marked the beginning of a noticeable increase in the use of the term coupled with specific (human) body parts in British book titles. Alongside Wardrop's work we have already encountered Monro's *Morbid Anatomy of the Gullet, Stomach, and Intestines* and Mills's *The Morbid Anatomy of the Brain, in Typhous and Brain-Fever*. In the next twenty years these were joined by works on the morbid anatomy of the liver, the brain, the urinary bladder, the stomach, bowels, and liver, the uterus, and, later, the serous and mucous membranes.[614] At the same time, the term was used for other kinds of work like museum catalogues and printed lecture series—even for the solitary issue of Farre's *Journal of Morbid Anatomy, Ophthalmic Medicine and Pharmaceutical Analysis* (London 1828).[615] In the early nineteenth century, there was thus a widespread drive toward publishing morbid anatomies that went beyond the relations between Baillie's mentees. Like Wardrop's book, this often took morbid anatomy in new directions, but ultimately these morbid anatomies had their foundation in Baillie's work.

Baillie's work was also relevant to projects at a more practical level. Most of the illustrations in the works discussed in this section were of preparations, with his work acting as a practical guide for the execution of others' work. Both Everard Home and Monro, for example, employed William Clift as well as James Basire II and James Heath respectively in the completion of their own illustrated projects. Some of these projects were completed using very similar procedures to Baillie's. Most notably, as Figure 23 shows, Clift made monochrome watercolours (interestingly alongside a schematic outline of the appearance) that were engraved by himself and Basire II for Home's *Practical Observations on the Treatment and of the Diseases of the Prostate Gland* (London 1811).

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[613] Wardrop 1808, vii.

[614] The specific works alluded to here are: John Richard Farre's *The Morbid Anatomy of the Liver* (London 1812–1815); Andrew Marshal's *The Morbid Anatomy of the Brain in Mania and Hydrophobia* (London 1815), James Mill's *The Morbid Anatomy of the Brain: in Typhous Fever* (Dublin 1818), Robert Hooper's *The Morbid Anatomy of the Human Brain* (London 1826) and Alexander Monro tertius's *The Morbid Anatomy of the Brain* (Edinburgh 1827); John Armstrong's *The Morbid Anatomy of the Stomach, Bowels, and Liver* (London 1826); Robert Hooper's *The Morbid Anatomy of the Human Uterus and its Appendages* (London 1832); Thomas Hodgkin's *Lectures on the Morbid Anatomy of the Serous and Mucous Membranes* (London 1836–1840).

[615] Examples of these three types of publication are: *Catalogue of the Museum of John Heaviside, Esq: Comprising Human Anatomy, Natural and Morbid, Comparative Anatomy, and Natural History* (London 1818); Leonard Stewart's *Modern Medicine Influenced by Morbid Anatomy: An Oration* (London 1830); John Armstrong's *Lectures on the Morbid Anatomy, Nature, and Treatment, of Acute and Chronic Diseases* (London 1834).

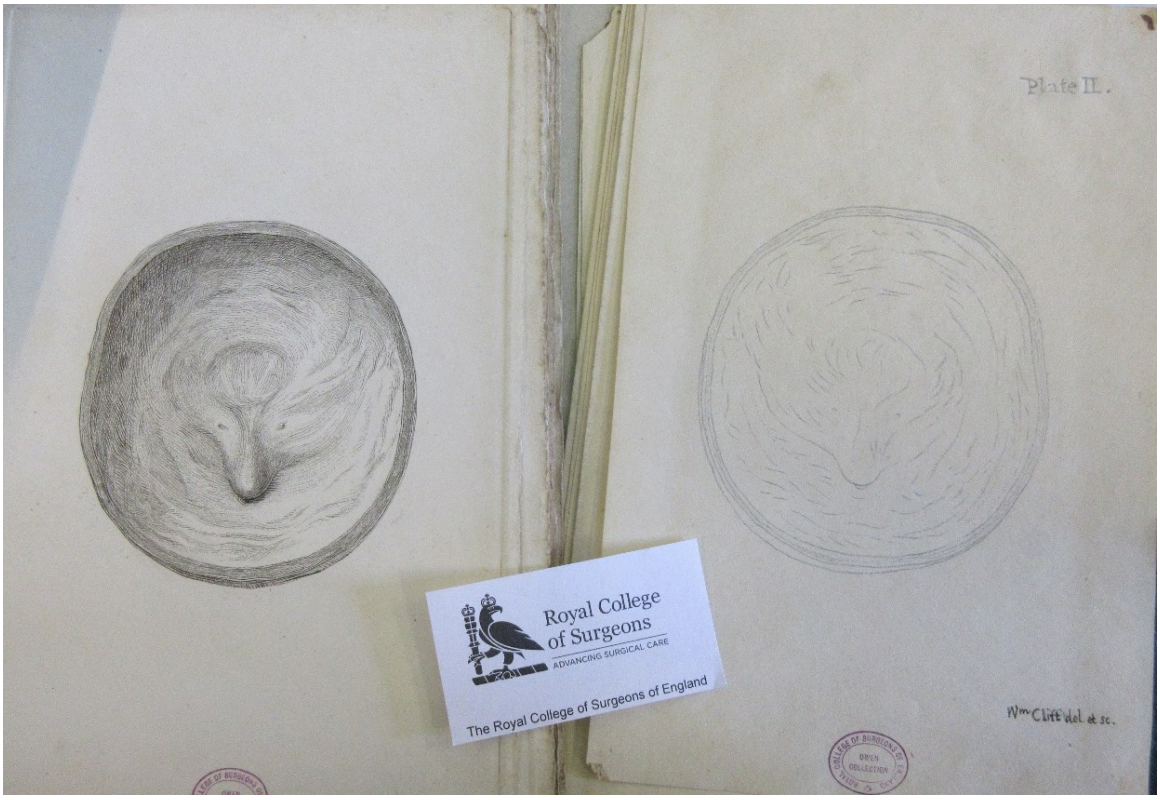

Figure 23: Clift's watercolour (left) and schematic drawing (right) for Plate II of Home's *Diseases of the Prostate Gland* (1811). William Clift, watercolour and pencil drawing, MS0007/2/2 Royal College of Surgeons of England Archive.

But significantly, these projects began to employ new types of printing techniques in order to represent morbid structures better. By the 1820s, various kinds of colour printing—typically stipple engraving with colouring *à la poupée* and lithography which coloured through the use of layers of flat tints—became much more common for such treatises, a development which was accompanied by a greater concern with representing fresh specimens.[616] Prior to that point, morbid anatomy illustrations were characterised by the range of techniques used, often employed to capture specific features of the structure and texture both in colour and monochrome. Baillie's focus on the texture and structure of lesions alongside his admission that line engraving could not comprehensively represent diseased structure therefore encouraged experimentation with how to capture the variety of diseased appearances in print by other practitioners.[617]

[616] James Hope's work *Principles and Illustrations of Morbid Anatomy* (London 1834) is a particularly striking example in that regard. Hope 1834; Bertoloni Meli 2017, 191-192, 202-203.
[617] Baillie 1799–1803, 4-5.

The best example of the variety of printing techniques potentially available to the practitioner in the early nineteenth century is Monro's *Morbid Anatomy of the Human Gullet, Stomach, and Intestines* which, as we saw in the previous section, used Baillie as a key authority. Monro's work included etching, engraving, mezzotint, and aquatint, used to demonstrate a variety of textures as necessary. In his introduction—which extolled the benefits of studying morbid anatomy—he explained the purpose behind his inclusion of illustrations: "As language is frequently inadequate to convey a correct idea of morbid appearances, I have subjoined several engravings, which were taken from the drawings of eminent artists". These preliminary drawings were primarily made by Andrew Fyfe the Elder, an anatomist and draughtsman who made a number of illustrated works of anatomy, and "the late Mr Donaldson (an artist of great merit)", though a number of other artists drew for the plates. The variety in Monro's printed illustrations stemmed from a mixture of serendipity and an active desire to represent specific textures of the body in print. Monro explained that (Thomas) Donaldson had produced drawings for his father's collection of prints under his supervision, some of which "were etched by the same artist" and were used in the new work as they were already in his possession and of sufficient quality. In other cases, Monro insisted on certain techniques being used to ensure faithful representations. For example, he used colour, "where colour constitutes *an essential feature*, […] in order that the engravings may be more faithful representations of nature".[618] For Monro, different printing techniques provided different opportunities to represent the textures of morbid anatomy.

Monro's comment emphasises that the use of colour in the early nineteenth century was one of many options that practitioners experimented with, which belies the linear narrative regarding its use that Bertoloni Meli has put forward. Bertoloni Meli explains that the importance of colour to morbid anatomy began to be emphasised through the publication of full-colour works on cutaneous diseases at the turn of the eighteenth century. Through the works of Robert Willan and Robert Bateman (who had studied under Baillie) in Britain, colour came to play a central role in the classification of skin diseases, which encouraged the use of a number of different methods to render colour by other authors.[619] This encouraged the take up of colour for works on morbid anatomy, becoming especially important for those who wished to represent "fresh specimens"—drawing straight from the cadaver or as near as possible to dissection—from the 1820s.[620] Whilst in broad terms this narrative fits the historical record, it

[618] Monro tertius 1811, xxiii-xxiv emphasis mine.
[619] Bertoloni Meli 2017, 125-153.
[620] Ibid., 155-183.

omits the motivation behind the conceptualisation of colour as, in Monro's terms, 'an essential feature' that had to be represented by authors. After all, it would have been cheaper and easier not to print in colour. In what follows I suggest that central to the growing conception of colour as vital to the representation of morbid anatomy was the increasing choice in representational strategy that the proliferation of printing technologies and techniques in the early nineteenth century provided for practitioners. As printing in colour cheapened alongside the cheapening of monochrome print, so the opportunities to experiment and explore the advantages of colour printing increased.[621] Before colour could become central to the works of practitioners like Richard Bright, for example, it existed as one option alongside many. Colour was one, occasionally vital, way of presenting the textures and structures of the body in print.

Figures 3 to 16 together demonstrate the variety in printing technologies available to authors like Monro present in just one work representing morbid anatomy in the early nineteenth century. These comprised both old and new technologies and techniques, employed in a variety of ways: the old techniques of line engraving sat alongside the newer techniques of stipple engraving, which sat alongside the new technology of lithography. Monro's desire for colour encouraged the use of aquatint, as well as hand-coloured etchings. These methods of representing morbid anatomy in print could be made further applicable to the variety of the diseased body through mixing techniques and technologies too. All of this work required Monro to interact with a wide variety of differently skilled practitioners in order to properly communicate the epistemic content of the image. Naturally this was difficult and affected the overall unity of the work. The enormous variety of printing techniques and technologies Monro used ultimately created a hotchpotch work that lacked the unified authority of Baillie's. The reader was confronted with the enormous variety of the diseased body, with little consistency between images; visually, Monro's work was all contrast and little comparison. Nevertheless, Monro's work provides an important insight into the experimentation that characterised the making of both morbid anatomy illustrations in the nineteenth century, as well as the success of doing so.

Beginning with line engraving, Figures 24 and 25 both use the same techniques but for different purposes. In Monro's terms, Figure 24 was a "very highly finished engraving … copied from a very fine preparation of Cancer, which occupied the greater part of the Gullet, and is preserved in the Museum of Mr Heaviside in London". Mirroring Baillie's work, not

[621] Topham forthcoming.

only was the object of the illustration a specific preparation, it was executed by James Heath after a design made by William Clift. Just as for Baillie's work, the structure and texture of the part was rendered in detail through the use of a variety of differently angled parallel lines and crosshatching (see Chapter 4). Once again, shading was an important feature in the illustration, especially behind the quill that had been inserted into the "aperture" in the gullet (point F), and all along the left-hand side of the inside of the preparation, which demonstrated "a number of fungous excrescences, of different sizes, grew from the inner Membrane" (point E).[622] The result of the shading was to emphasise the grounding in nature and observation that the image had, but also enabled the diseased appearances to be viewed in as many different ways as possible in a single image. In this regard, the presentation of the plate closely mirrored those in Baillie's *A Series of Engravings.*

[622] Monro tertius 1811, 350.

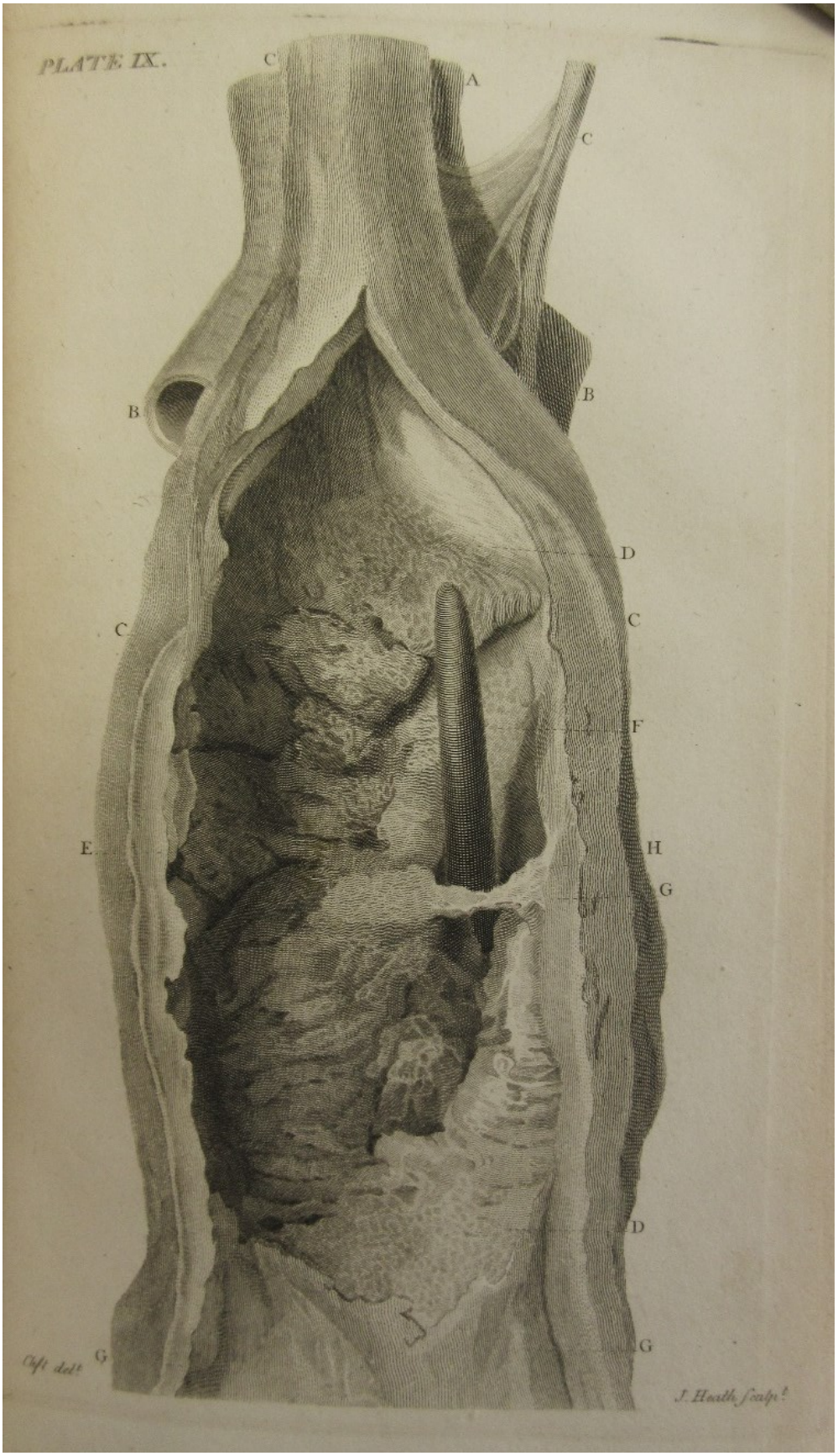

Figure 24: Cancer affecting the gullet. Monochrome line engraving: William Clift artist, James Heath engraver. Alexander Monro tertius, Plate IX, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Unlike Baillie's work, Monro mixed styles of engraving to fulfil different purposes. Figure 25 was also a line engraving which employed the same engraving techniques by unknown makers (though the artist was possibly Fyfe the Elder), but in this case a schematic image was made. Here the concern of the illustration was to show the vessels in both sides of the pelvis of a female (top) and male (bottom), comparing both the distribution of the vessels, as well as the different sizes of the relevant parts in each instance. For example, in the male image, which was of the left-hand side of the pelvis, Monro observed that: "The Aperture X [in the bottom image] on the internal side of the Anterior Iliac Vein is of a different shape and size from that of the female Pelvis", encouraging comparison. Meanwhile the image of the female (top) was "an inside view of the right side of the Pelvis of a woman, who died in consequence of Crural Hernia" and thus demonstrated different anatomical features as well as morbid anatomical features.[623] Monro discussed this illustration in some detail in the body of his work, the epigastric and obturator arteries being especially significant due to their "common origin" (point F).[624] The focus and emphasis Monro placed on the vessels lent itself to the production of a schematisation of the appearance, as the abstraction of the diseased appearance from the messy contingency of the body made the structure of the vessels in relation to the pelvis clearer. Because the purpose was to enable detailed structural comparisons, the texture of the surrounding parts was not a priority for Monro and his collaborators. Indeed, including such detail may have worked to obscure the structure, and therefore the purpose of the representation. In Monro's work, the function of the images to present morbid anatomical knowledge was prioritised ahead of coherence to a specific style of representation.[625]

[623] Ibid., 500-501.
[624] Ibid., 426-427, 500.
[625] On style in anatomical illustrations see: Berkowitz 2015b, 171-208; Kemp 2010, 192-208.

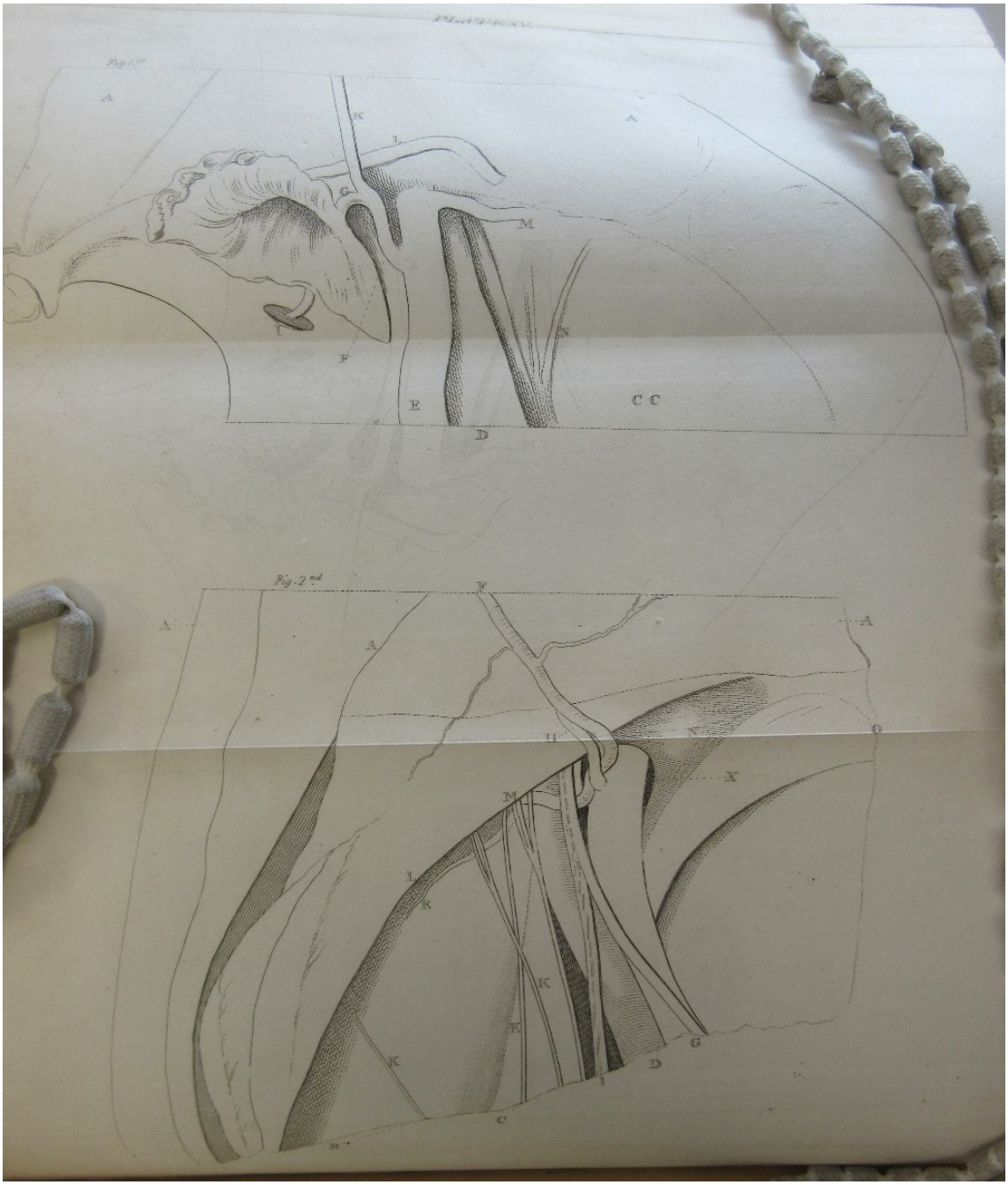

Figure 25: Schematic illustrations of the female (top) and male (bottom) pelvis. The female pelvis is affected by a crural hernia. Monochrome line engraving: unsigned. Alexander Monro tertius, Plate XV, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Such dynamic use of representational styles ran across the use of different techniques of engraving for intaglio printing in Monro's work. Figures 5 and 7 show different innovations in line engraving that were employed by Monro and collaborators to present detailed and schematic illustrations of morbid anatomy as he deemed appropriate. Figure 26 used a 'dot-and-lozenge' style to represent the "Cavity of the Caput Coli" after the removal of a concretion

like those shown in Figure 34. This was a relatively new technique that was developed in the late eighteenth century, and quickly but briefly became a cornerstone of virtuosi reproductive engraving for neoclassical works.[626] Like line engraving, a series of parallel lines and crosshatchings were used to indicate structure and texture, but, as in Figure 26, the (unknown) engraver made dots with the burin in between parallel lines (see the centre of the enhanced section in Figure 27).[627] This aided the sense of bulk in the part without requiring extensive crosshatching or more lines, which in turn enabled the highly detailed areas with such lines to be easily differentiated, whilst simultaneously maintaining the overall coherence of the image to the viewer.

[626] Monro tertius 1811, 72-73.
[627] Griffiths 1996, 55.

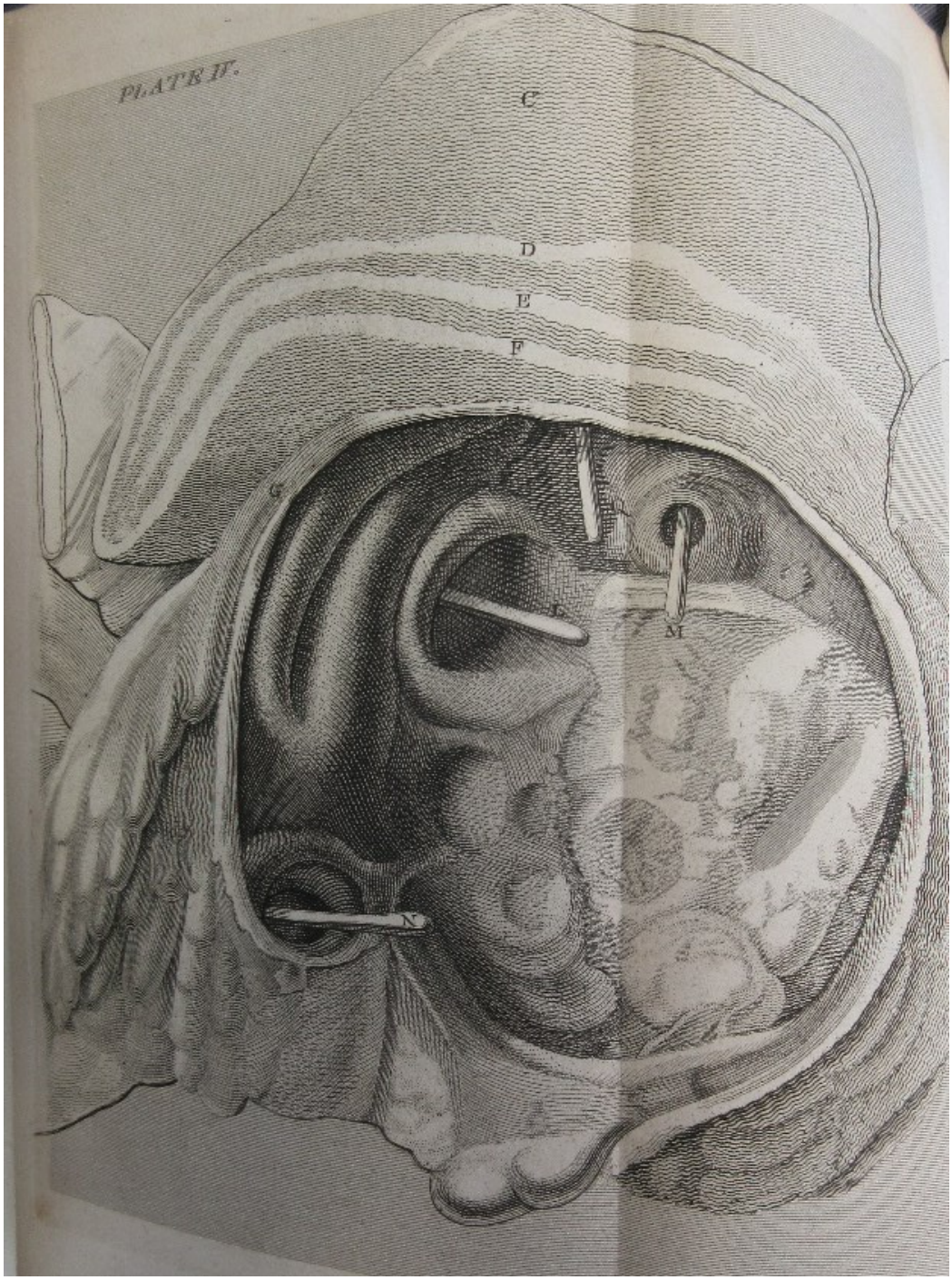

Figure 26: 'Dot-and-lozenge' technique used to represent the cavity of the caput coli. Monochrome line engraving: unsigned. Alexander Monro tertius, Plate IV, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Figure 27: Detail of Figure 26 showing the 'dot-and-lozenge' technique. Monochrome line engraving: unsigned. Alexander Monro tertius, Plate IV, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Figure 28 used another technique used for intaglio printing that was developed over the course of the eighteenth century: stipple engraving. Practitioners used a point rather than a burin to dot the plate, building up a mass in order to represent tone better than line engraving could through its various techniques. As Antony Griffiths explains, the softness of the effect led to it being particularly used for romantic effects, but it was quickly surpassed by other techniques in the nineteenth century.[628] In Figure 28, the tonal quality of stipple was important in making the illustrations appear unified across the whole plate. When line engravings were employed for a similar task, there was a risk of the non-detailed areas appearing unfinished compared to the detailed areas. But in Figure 28, the tonal quality of the wave of stipple engraving—eddying here and flowing there (see Figure 29)— gave a unified appearance across the whole plate, which aided the natural appearance of the image, even as it was clearly

[628] Ibid., 77, 81-83.

schematic. The plate represented in its detail in the top image "a small Omental Hernia, which had passed from the sheath of the Lymphatic vessels" (underneath F, G, E), and in the bottom "two Hernial Sacs" contained within the lymphatics and "cellular sheath of the Femoral blood-vessels" respectively.[629] Just as for Figure 25 then, there was a concern with representing the vessels that encouraged Monro and collaborators to avoid over-cluttering the plate with detail. But due to the specific concern of the plate with representing hernias, there was a requirement for detail in parts. The use of stipple engraving bridged the divide between producing schematic and detailed illustrations in a way that produced an image unified through the tonal quality of the print.

[629] Monro tertius 1811, 502.

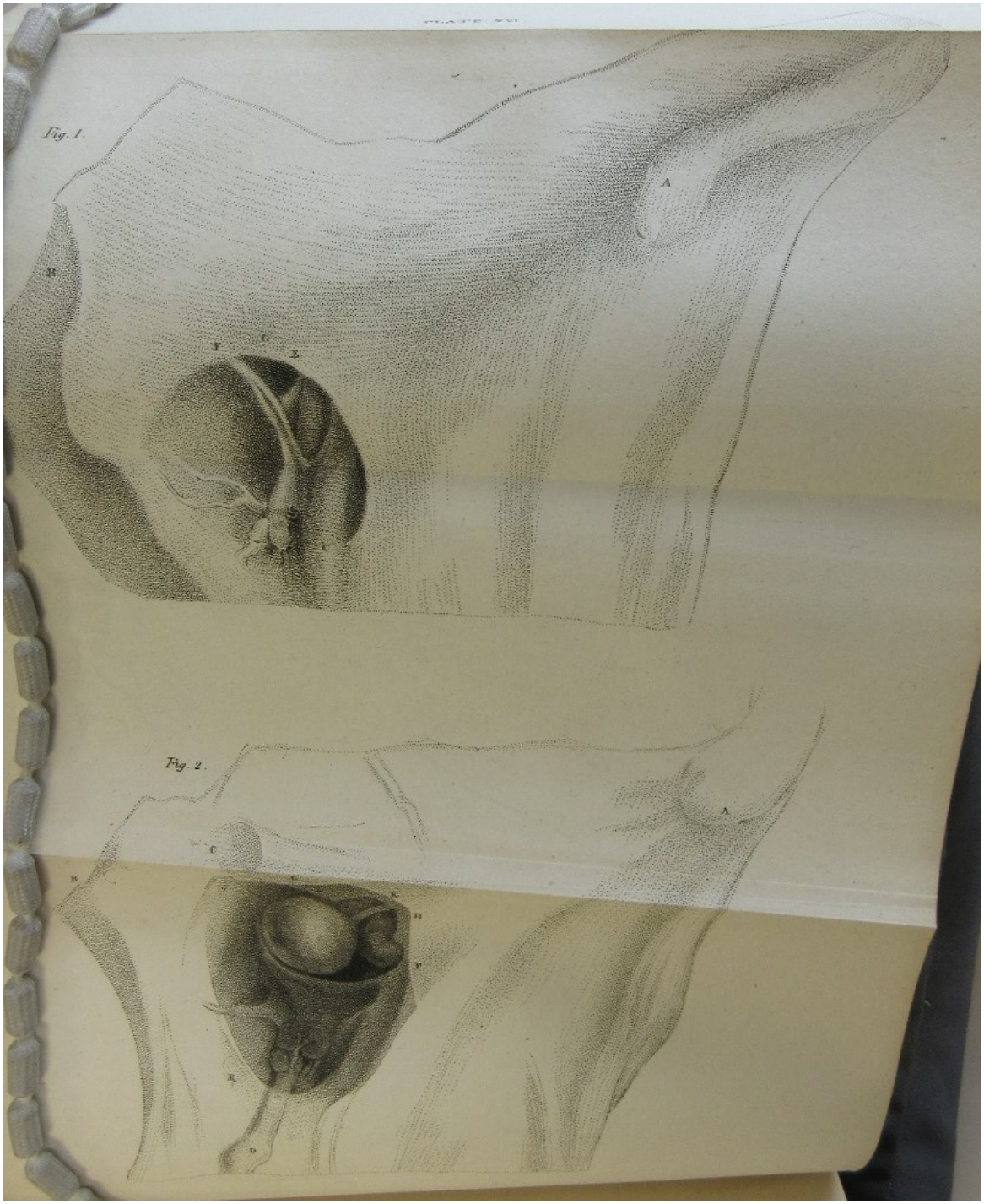

Figure 28: Stipple engraving used to represent an omental hernia (top) and two hernial sacs (bottom). Monochrome stipple engraving: unsigned. Alexander Monro tertius, Plate XVI, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

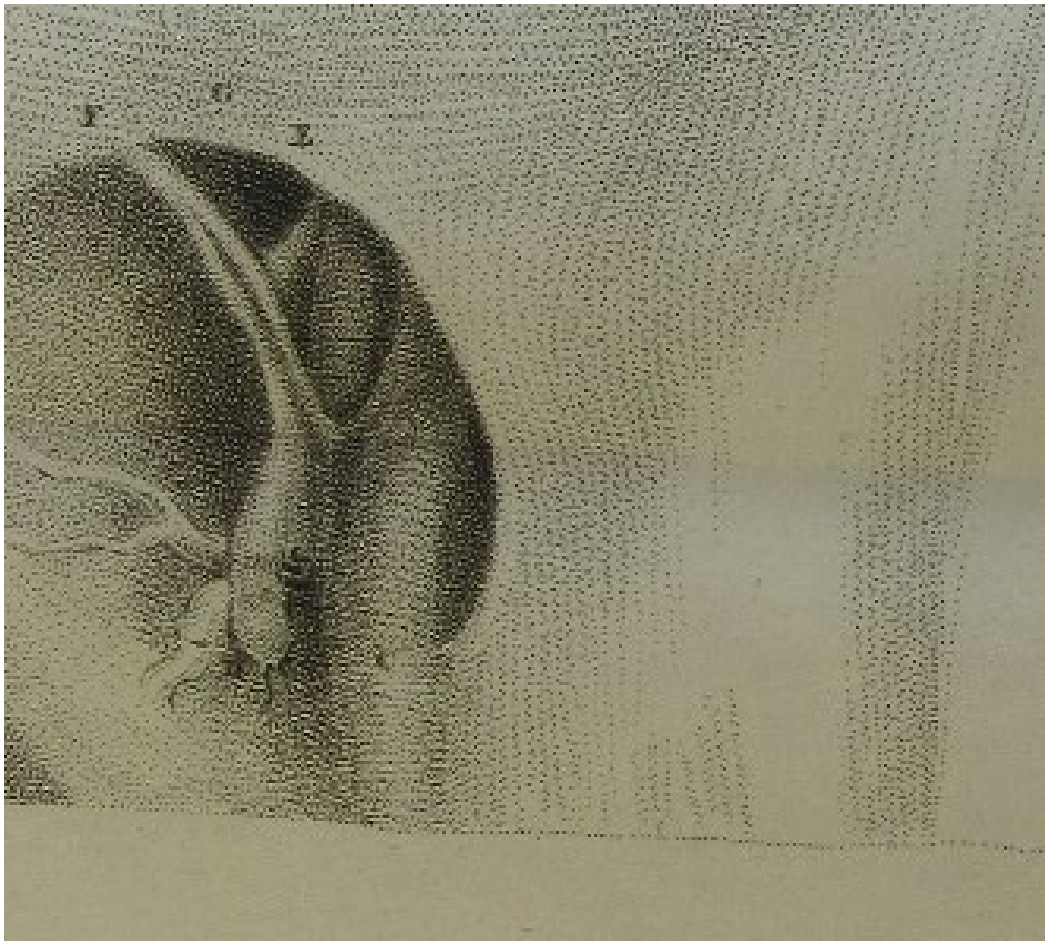

Figure 29: Detail of Figure 28 showing the stippling render detail through close stippling, and indicate structure through looser stippling. Monochrome stipple engraving: unsigned. Alexander Monro tertius, Plate XVI, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Tone was an important way of producing coherent images for Monro, and encouraged the use of mixed techniques in order to represent the part in question sufficiently well. The use of mixed techniques can be found throughout the work. At times, this was the fairly straightforward and common mixing of intaglio techniques like traditional engraving with etching, or stipple with alongside line engraving. Other techniques used and mixed with others were more unusual in scientific works, such as mezzotint, which was usually used for reproductive portraits.[630] Figure 30, which represents "an Intus-Susceptio", a type of strangulation of the intestine, was made through mix of etching and mezzotint techniques. Practitioners using mezzotint first lay a ground over the copperplate which is then

[630] Griffiths 1996, 85-87. Berkowitz discusses the example of Charles Nicholas Jenty who was severely criticised for making mezzotint illustrations of the human gravid uterus in the 1760s. See Berkowitz 2015b, 185-188.

systematically worked over with a spiked 'rocker' tool that creates a roughened surface that is then scraped out. The rougher the area, the more ink it will hold and vice versa.[631] In Figure 30, Monro and (again unnamed) collaborators represented a large section of intestine, opened at the inverted part of the colon (FF, HH, left whole at GG), showing the full course of the strangulation. The key emphasis in the image was the overall effect of the morbid appearance on the structure of the intestine rather than detail, which encouraged Monro, as he had for Figures 25 and 28 to represent a large portion of the structure. So his focus was on providing an overall presentation of the effect of the strangulation on the parts, rather than on detailing textures. Yet unlike these figures, it was not schematic as 25 and 28 were. Instead, Monro and collaborators attempted to comprehensively represent the structure through the unifying effect of the tone employed as well as etching to solidify important aspects of the structure at key points. As Figure 31 shows, parts of the plate were etched, parallel lines and crosshatching providing a greater sense of structure at certain key points (see under point E, and the boxed area). The use of mezzotint by Monro thus produced an image that presented the structure comprehensively in a distinct tone, and worked to provide accurate, though not necessarily detailed, indications of the structures of the affected parts.

[631] Griffiths 1996, 83; Gascoigne 2004, 53 a, b, c.

Figure 30: Mix of mezzotint and etching used to represent the intestines and a type of strangulation of them ("Intus-Susceptio"). Mezzotint and etching: unsigned. Alexander Monro tertius, Plate XXI, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

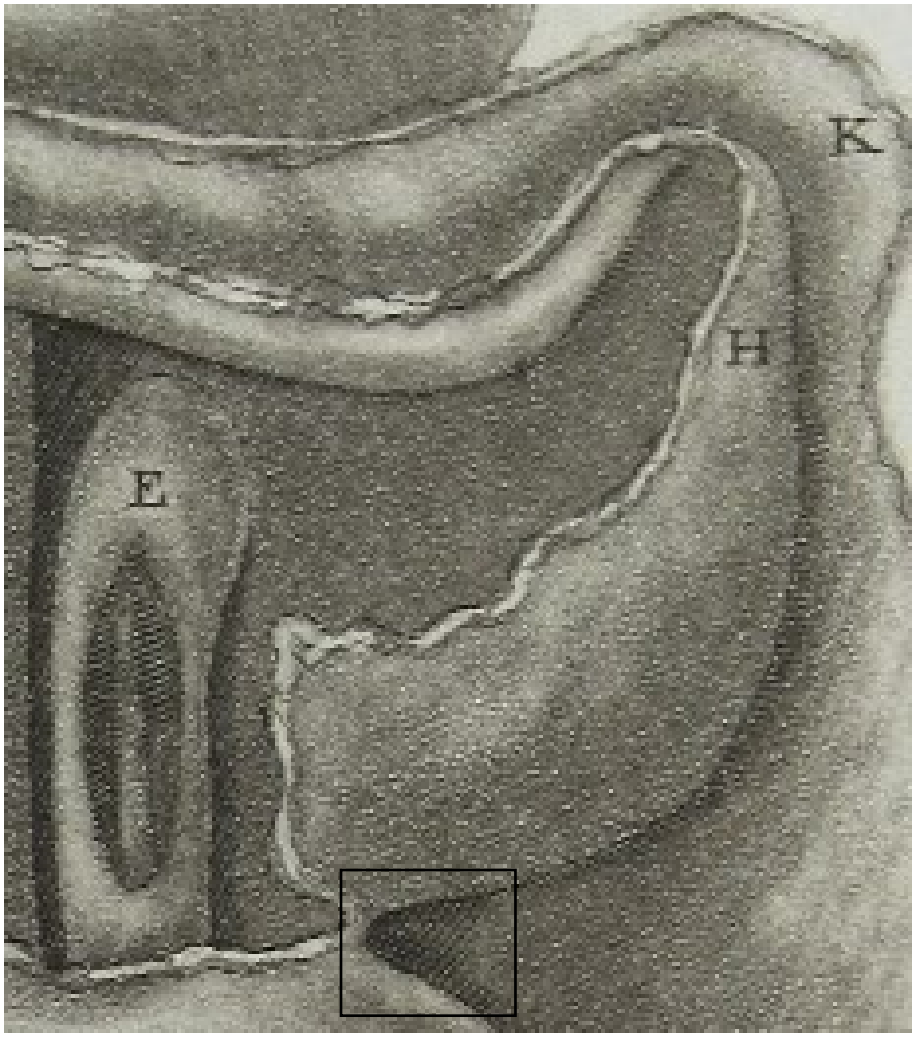

Figure 31: Detail of Figure 30 showing crosshatching (in box) and parallel lines (under point E) created by etching the plate. Mezzotint and etching: unsigned. Alexander Monro tertius, Plate XXI, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Throughout Monro's illustrations, there was thus a negotiation between the purpose of the image—what its ostensive function was in the work—and the qualities of various printing techniques in being able to represent that purpose. In both Baillie's and Monro's work, much of the purpose, and thus an important site of negotiation, had been with pointing to specific features of diseased appearances in order to render them recognisable to the viewer. But new printing technologies enabled different authorial priorities to be realised in print. Figure 32 shows an extensively herniated bladder, for which Monro gave the full case history as it had been related by the surgeon "Mr A. Burns of Glasgow" in 1808. Monro believed that the hernia likely had been generated in the late months of pregnancy. On dissection, the urinary bladder was found to be "stretched across the Pelvis", with the centre of the pelvis depressed so much

that “the upper surface of the Vagina was forced out between the Labia Pudendi”. The hernia pulled the shoulders of the bladder “out into processes, which were traced, descending like horns on each side of the Vagina” and so on.[632] In summary, the hernia affected a large portion of the woman’s body and a number of her organs. Whilst there was one specific site in which the hernia originated, the morbid appearance was not only located there, but in the collateral damage caused by the hernia. Monro therefore prioritised representing the extensive damage through an impressionistic image, using the new technology of lithography to do so.

Though lithography came to be a vital tool in the representation of scientific fields like geology, in the early 1810s, the use of the technology was in its infancy despite being invented in 1796.[633] Lithography used a ‘surface’ or ‘planographic’ type of printing process instead of intaglio or relief, whereby the marks made on a porous kind of limestone that could absorb grease and water equally were chemically fixed to the stone, inked, and then printed in a ‘scraper press’ which involved scraping the back of a sheet of paper adhered to the inked surface in order to transfer the ink to it.[634] The process had distinct qualities that made it especially useful for producing a graphic, or crayon-like quality to images. In Figure 32 we can see the overall effect of the technology for Monro’s illustration. The herniated bladder is rendered softly through the use of sketchy, interpretative lines. Figure 33, an enlarged part of Figure 32, demonstrates that in place of the keen lines of line engraving with the strict regimentation of various directional parallel lines and crosshatching, the lithographer—a “Meadows”, on whom I have found no further information—employed a mix of sweeping lines, curves, and circles, across a huge variety of depth of mark. The use of lithography was one way in which practitioners could produce large prints more cheaply than through line engraving, making it an enormous attraction to scientific periodicals from the 1820s onwards.[635] But moreover, for Monro it produced an effect of grossness, in terms of both heft and horror. In this case, the damage caused by the hernia was so extensive as to make the production of precise line engravings worthless—they would miss the point. The point was to represent unruliness through defiantly unruled lines.

[632] Monro tertius 1811, 523-528.
[633] Topham forthcoming; Griffiths 1996, 104.
[634] Griffiths 1996, 100-103.
[635] Topham forthcoming.

Figure 32: Herniated bladder generated during pregnancy indicating collateral damage to the area. Lithograph: Meadows lithographer (unknown if an artist involved). Alexander Monro tertius, Plate XI, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Figure 33: Detail of Figure 32 showing the crayon-like quality of the marks made by the lithographer. Lithograph: Meadows lithographer (unknown if an artist involved). Alexander Monro tertius, Plate XI, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

All of this work was with a view to represent the morbid anatomy in the best manner appropriate to the part and morbid appearance in question. As we have seen, this incorporated old and new technologies and techniques employed in a variety of ways across a number of different organs and diseased appearances. But, as Baillie discussed in his own work, on

occasion, the colour of the morbid appearance was of vital importance to that part's understanding. And Monro clearly concurred, providing a few coloured plates, again using a variety of techniques and technologies, alongside his extensive representation of disease in monochrome.

The very first plate in Monro's book was a hand-coloured etching drawn and engraved by Donaldson representing "three Alvine Concretions" (Figure 34). The three figures were printed in brown ink before being hand coloured with washes and, in darker parts, what appears to be black ink. I have enlarged the first figure on the plate (Figure 35) to demonstrate that the variety in tone was primarily achieved through varying the both the density and regularity of the crosshatching. Lighter areas had little hatching and irregular, sketchy lines, medium areas had some hatching but not in a systematic manner with the lines being densely packed in an almost random manner (possibly indicating that Donaldson was not well-acquainted with the technique), whilst the darkest areas had uniform crosshatching that contained less tightly packed but thicker lines. These lines were then enhanced by the addition of black ink over the top. As Monro put it, this was intended to show that the concretion was "encrusted by a dark-coloured substance, about two lines in thickness", whilst "In the interior part of the uppermost part of the Concretion there were a few shining crystals, which was another peculiarity in this remarkable Concretion".[636] The importance of representing the colourful aspects of the finding thus encouraged the use of colour in his representation. But it is notable that Monro reused the plate already etched by Donaldson in his father's collection to do so. Rather than add additional cost to the process, the use of brown ink (which was typically associated with cheap prints) and hand-colouring was a cheaper way of rendering the colour that made use of the sunk cost of the etching. Colour was important to Monro, but not at any expense.

[636] Monro tertius 1811, 71.

Figure 34: Etching of three "Alvine Concretions" printed in brown ink then coloured by hand. Hand-coloured etching: Thomas Donaldson artist and etcher (colourist unknown). Alexander Monro tertius, Plate I, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Figure 35: Detail of Figure 34 demonstrating the use of brown ink, irregular hatching, and black ink hand applied for shading. Hand-coloured etching: Thomas Donaldson artist and etcher (colourist unknown). Alexander Monro tertius, Plate I, Morbid Anatomy of the Gullet, Stomach, and Intestines 1811.

In that regard, the publication of Monro's fifth plate was exceptional (Figure 36). A full-colour aquatint was viewed as necessary by Monro to represent the "milt-like tumour, which grew from the Stomach" as "verbal description is inadequate to convey a correct idea of Morbid appearances" in this case, despite the preceding pages having attempted precisely that.[637] Drawn by "Mr Syme" and executed by an "E. Mitchell", the aquatint was "carefully coloured after the original drawing", with the intention of providing "a more faithful representation of nature".[638] In Britain, aquatint was typically used to imitate the appearance of watercolour washes laid over an ink outline.[639] We might assume then, that Syme's original drawing was a full-colour watercolour that Mitchell used as a basis for the complex printing process. Aquatints are made through applying a porous ground to a plate before applying acid

[637] The case in question was reported to Monro by Mr Charles Anderson of Leith. Monro tertius 1811, 164-180.
[638] Monro tertius 1811, 180.
[639] Griffiths 1996, 94.

that bites into the plate, creating tiny depressions in its surface that allows it to hold ink. The process produces a single tone per print, and cannot produce lines. As a result, in the eighteenth and nineteenth century, aquatint was often combined with etching to give the desired 'watercolour over drawing' effect.[640] Colour, meanwhile, was produced through the use of multiple, single-tone plates printed for individual images.[641] For Monro's plate, it was important to represent the purple of the thickened villous coat, the dark purple blood contained in the varicose veins in the plexus that covered it, and the "milt-like" colour of the tumour (milt is the seminal fluid of fish and molluscs).[642] As the enhanced image of the plate, Figure 37, shows, for the various purples this required a layering of red and blue-green tones in aquatint, as well as what appears to be hand coloured flourishes of dark purple applied over the top to represent the veins. In Monro's aquatint, we can see both the advantages and issues with colour printing morbid anatomy illustrations in the nineteenth century—it was possible to represent colour sufficiently, but the printing processes were more complex than for monochrome and often required further steps, including hand-colouring, after printing to render the precise details of the texture and structure sufficiently. Baillie's work had thus encouraged the proliferation of types of printing process in order to more comprehensively render the textures and structures of the body in print, but it remained a laborious process.

[640] Ibid., 89-90.
[641] Ibid., 118-119.
[642] Monro tertius 1811, 180.

Figure 36: "Milt-like tumour" grown on the stomach executed in the traditional British style of aquatint. Aquatint: P. Syme artist and E. Mitchell sculptor. Alexander Monro tertius, Plate V, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

Figure 37: Detail of Figure 36 showing the use multiple tinted plates to create the purple colour as well as hand-colouring for the deep purple. Aquatint: P. Syme artist and E. Mitchell sculptor. Alexander Monro tertius, Plate V, *Morbid Anatomy of the Gullet, Stomach, and Intestines* 1811.

In summary, there were a proliferation of illustrated works on morbid anatomy in the early nineteenth century, that employed the same methods of representation as Baillie, now expanded by printing technologies. This enabled practitioners to experiment with different kinds of representation and representational strategy, which in turn saw a greater variety of textures and structures of the diseased body represented than previously, including in colour.

5.3: Teaching Morbid Anatomy in the Early Nineteenth Century

Baillie's work and the practice of morbid anatomy thus became central to publications on disease in the early nineteenth century; but what did that practice look like? In this section I argue that morbid anatomy in Britain was primarily an anatomical practice, and closely related to the teaching of anatomy in the period. Partly, this was due to the example of Baillie himself who developed his work at an anatomy school with an anatomy museum. Individual practitioners, likely aware of Baillie's successful career, collected anatomy and morbid anatomy for their own courses. Though anatomy teaching during the century gradually became more institutionalised within hospitals and universities, in the early nineteenth century, methods of collecting for museums remained based on the personal capacities, drives, and desires of individual practitioners.[643] Samuel J.M.M. Alberti has argued that collecting anatomy increased in scale from the eighteenth into the nineteenth century, with the collection of diseased appearances being central in this increase. Employing a Maulitzian framework, he has thus identified a "disjuncture" between interest in collecting morbid appearances and the slow institutionalisation of "Parisian medicine" in Britain: just what was the purpose of collecting disease prior to the advent of 'the clinic' in Britain? Alberti resolves this tension through appealing to museum practices. He claims it results from: the "organizational arrangement of material culture and the status of the roles associated with collections: the historical geography of British medical museums".[644] In what follows, I show that morbid anatomy offers another, complementary, explanation for the uptake of collecting disease at a time when the status of the developments in Paris remained in question in Britain: collecting diseased appearances was central to the practice of morbid anatomy.

It is precisely because the practice was closely linked to anatomical practices that morbid anatomy has been overlooked by historians. Instead of the clinic and the patient encounter, the practice was primarily located at anatomy schools, in the theatre, in the museum, and in instructional works on anatomy. In this section I therefore examine three separate examples related to anatomical teaching in the nineteenth century that serve to demonstrate the wide integration of morbid anatomy with anatomy. First, I show that Charles Bell's anatomical teaching fully incorporated morbid anatomy. In doing so, morbid anatomy was married to the efforts at conservative reform in British medicine that Berkowitz has identified in her biography of Bell. Secondly, the example of John Richard Farre's proposal for a new school

[643] Alberti 2011, 19. On anatomy teaching at hospitals in this period see: Lawrence 1996.
[644] Albert 2011, 19, 26-28.

of ‘minute anatomy’ demonstrates the explicit and active advocacy of morbid anatomy as a point of unification within medical teaching in the early nineteenth century. Such plans would maintain the hierarchical structures of British medicine—the Royal College of Physicians and the newly constituted College of Surgeons—through properly delineating professional boundaries in the treatment of patients. In my third example, I show that this kind of work entailed and resulted in practices beneficial to both physic and surgery. Frederick John Knox’s publication on making medical museums included extensive accounts of making morbid anatomy preparations, summarising a generation’s work on the subject. The expansion of museum collections in the nineteenth century embedded morbid anatomy as a central feature of British medicine.

At the beginning of the nineteenth century, the teaching of anatomy in Britain had changed compared to the commencement of Hunter’s own career, in large part due to Hunter’s example. It was now expected that medical students would dissect a body for themselves (though it was not legally necessary), and that this would involve the use of preparatory techniques such as injection alongside knifework. Guides to such work, like Thomas Pole’s *Anatomical Instructor* (1790) were published that explained in detail all the necessary operations for preparation. Gone were the days of Hunter’s youth when it was necessary to learn specific techniques from specific masters (see Chapter 2). Nevertheless, the individually owned anatomy school was still a viable commercial prospect, the institutionalisation of anatomical teaching within hospitals and universities still incomplete. For example, in 1812 Charles Bell bought the Great Windmill Street school, where, as Berkowitz has shown, he promoted a conservative reform agenda based around medical pedagogy:

> For Bell, this vision of conservative reform focused on a pedagogical approach that positioned practical anatomical experience as the key to a specifically British medical tradition. Other conservative reformers might have articulated slightly different versions of medical education, but they shared a belief that British medicine could be improved through incremental changes rather than radical transformation, and most rooted these changes in some form of pedagogical reform.[645]

A central point of definition for this conservative reform movement came to be opposition to a French-style of teaching being imposed on existing British systems. Instead, reformers defined a national ‘tradition’ that was characterised fundamentally by competition in teaching—private anatomy schools like Bell’s continued the practice of saving the communication of their discoveries for their students for instance. Furthermore, this system was promoted by its

[645] Berkowitz 2015a, 3.

advocates as being a "joint education in surgery and medicine, something that might be regarded as French by the historian but that was carefully couched in British nationalism by Bell's contemporaries". Central to such characterisation was the teaching of anatomy, which was necessary for both surgeon and physician.[646] Because of Baillie's work defining an anatomical approach to the study of disease, morbid anatomy also acted as an important point of unity between surgery and physic.

Consider Bell's *A System of Dissections, Explaining the Anatomy of the Human Body* (Edinburgh 1798). It was a designed to give the student "plans upon which to proceed", in undertaking dissections. With practicality as its purpose, "the method to be pursued" was "obvious", in order help the reader to learn anatomy and morbid anatomy. Bell's plan was as follows:

> to give a short detail of the anatomy; to show how the parts are to be laid open, and how they are to distinguished in dissection, or avoided in operation; to explain the consequence of each part to the great functions of the body, and to mark the diseases to which it is liable.[647]

In the course of the work, he therefore discussed morbid anatomy on several occasions, and included references to Baillie's work.[648] As the work was intended as a step-by-step guide to dissection, it was focused on informing the student where diseased structures were mostly likely to be found, such as: "Where the arch of the colon crosses the belly, it lies contiguous to the stomach; and here, too, communications are sometimes formed by disease".[649] Bell later explained his treatment of morbid anatomy in more detail.

> In treating of the morbid anatomy, I have endeavoured to avoid the appearances of attention to minutiae where nothing is understood, or where I could give no information; sensible that such an attempt fills the eye only, and becomes a mere catalogue of diseases. But I have attempted to place this part of my subject upon the wider basis of the mechanical action of the parts or general consequences, extensively applicable, as depending upon the laws of the economy".[650]

Bell thus avoided writing a nosological style work, instead focusing on organising morbid anatomy within physiological categories—Baillie would have certainly approved. Indeed, Bell's collecting was similar to that of Baillie's too. Just as under Hunter and Baillie, Bell's Great Windmill Street school had an extensive museum of regular and diseased parts organised

[646] Berkowitz 2015a, 89-92.
[647] Bell 1798, iii-iv.
[648] Ibid., 14.
[649] Ibid.
[650] Ibid., 90.

by a catalogue that explained and gave context to the preparations housed there.[651] Berkowitz has argued that Bell saw William Hunter as an important predecessor for his own pedagogical practice.[652] But Bell's inheritance from Hunter was refracted through Baillie's work.

As Maulitz has observed, John Richard Farre's work was also refracted through Bailliean morbid anatomy, which, in his terms, Farre viewed as "a nascent speciality that transected medicine and surgery".[653] Maulitz sees Farre as a sort of cognitive 'missing link' between the work of Hunter and Baillie and that of Richard Bright, Douglas Carswell and Thomas Hodgkin in the 1830s and 1840s, with Farre's work being something of a dead end representing "a particular, forgotten variety of British pathology" related to particular institutional and intellectual affiliations.[654] More specifically, Farre wrote a short work, *An Apology for British Anatomy, and An Incitement to the Study of Morbid Anatomy* (London 1827), that promoted a new school of anatomy intended to encourage the study of morbid anatomy. As a pedagogical project, intended to promote the pursuit of morbid anatomy, this work is therefore worth examining in detail.

Farre's plan had been conceived in 1825, put into action in the spring of 1826, and outlined in lecture form towards the end of 1826 with a view to promoting the opening of the "Academy of Minute Anatomy" on 26 March 1827. To further facilitate the promotion of this new academy, Farre published the lecture in a short, but large, elephant-folio sized work, that also included some plates and descriptions of the morbid anatomy attending to hydrocephalus. As he explained, his object was "Firstly, To cultivate the Anatomy of Structure, as contradistinguished from the Anatomy of Relative Situation, which chiefly occupies the attention of the Schools". The latter was a more surgically focused anatomy, as it aided the undertaking of operations, the former more suited to the study of morbid anatomy. For Farre, this was research into "Minute *Morbid* Anatomy, not only those organic changes which distinguish structural from functional diseases, but also to trace the peculiarities of the organization of morbid parts" in various ways.[655] This would naturally aid diagnosis as well as the understanding of diseases.[656] Clearly, this was in line with Baillie's conception of morbid anatomy, though Maulitz emphasises that there were differences—Farre emphasised students'

[651] Ibid., 58-59.
[652] Berkowitz 2015a, 46-48; Berkowitz 2013, 359-387.
[653] Maulitz 1987, 190.
[654] Ibid., 175-176.
[655] Farre 1827, 5 author's emphasis.
[656] Maulitz 1987, 190-191.

drawing for themselves as a pedagogical tool for example.[657] More significantly, Maultiz argues that Farre was explicitly nationalistic, "xenophobic" even, in his promotion of British teaching ahead of France.[658] But this characterisation goes too far.

Whilst Farre did praise the unique "genius of the British nation", he noted a number of foreign contributions to anatomy—singling out Albinus especially—ultimately identifying the specific advantage of the British approach as practicality. For Farre "British anatomy is, therefore, physiological", where "the morbid anatomy of the French School" was confused "by a verbose and inflated style".[659] Given the period in which this was written, it is likely that Farre was specifically referring to François-Joseph-Victor Broussais, who indeed had a controversial, dogmatic approach to disease, of which many of his own countrymen disapproved.[660] Farre instead praised simple description: "Harvey and Baillie may be cited as examples of brief and simple perspicuity" and therefore advocated the practical morbid anatomy of Britain, ahead of the distinct 'morbid anatomy' of France. He went on:

> to the junior members of the Profession, the Lecturer would earnestly press on their attention still more general views of the extensive application of Morbid Anatomy to Medicine and Surgery. He would remind them that the grand division of disease, into structural and functional, can only be demonstratively obtained in the former, by the aid of Anatomy.[661]

In the 1820s British morbid anatomy was thus promoted as an anatomical subject that could act as a united point of study for both physicians and surgeons. The advantage of this would be to aid the understanding of and distinction between diseases for the benefit of both practices. In turn, this would benefit medical practice as a whole in Britain, as it would clearly delineate physic and surgery helping patients to be more appropriately treated as a result.

Such work encouraged the collecting of diseased parts. Alberti has argued that in the nineteenth century, the collecting of disease was central to the growth of medical museums—in private and institutional collections, diseased parts were brought together to provide a view of the whole body affected by disease.[662] Not only did this require individuals skilled enough to carry out the tasks associated with creating collections, but a clear motivation in doing so.

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[657] I have not encountered comments on the value of student drawing in Hunter or Baillie's works, but it seems likely to me that they would not have been against such work, though in not specifically advocating it compared to Farre there is clearly a difference. Farre 1827, 5; Maulitz 1987, 180.
[658] Maulitz 1987, 181.
[659] Farre 1827, 7-9.
[660] Canguilheim 1991, 47-63.
[661] Farre 1827, 9.
[662] Alberti 2011.

In the early nineteenth century, the pursuit of anatomy and morbid anatomy for teaching purposes was that motivation.

Frederick John Knox's *The Anatomist's Instructor and Museum Companion: Being Practical Directions for the Formation and Subsequent Management of Anatomical Museums* (Edinburgh 1836) was one of the first of a number of manuals on making anatomy and morbid anatomy museums published in the nineteenth century. As Alberti observes, these manuals reflected the take up of what he terms "pathological anatomy" (read: morbid anatomy) in Britain, and incorporated sections on making preparations specifically related to individual diseases that did not exist in equivalent eighteenth century works.[663] They also reflected that work on making anatomical and morbid anatomical collections had taken place since the turn of the century. In the preface to his work, Knox was clear that his manual on the formation and management of anatomical museums stemmed from many years of experience, rather than recent work:

> If Museums, whether of healthy or morbid anatomy, are of any use in the acquisition of anatomical knowledge, *it has for many years appeared to me* that a practical Treatise on their foundation and subsequent management, would be a great boon to the student.[664]

He then went on to outline his experience at the Royal College of Surgeons of Edinburgh where he "dissected and displayed, for a succession of years, from two to three hundred preparations annually", and had been involved in the "most arduous" labour involved with moving the collections "by Wilson, Cruickshanks, and others" from Great Windmill Street to Edinburgh.[665] Such collecting was clearly a widespread and valued practice in Britain.

Knox was clear why these collections were so valuable, especially when on a large scale. They were vital to medical practice because they formed the foundation for the understanding of disease. As a result, there was much to be gained from studying collections.

> It is admitted that a great many preparations in that museum [the Hunterian museum] point out facts with which we are still unacquainted. So few indeed appear to me to be aware of the true nature of museums, and *what* they are to see and learn by visiting them, that I for a long time doubted very much the use of *extensive* collections. Experience, however, has convinced me that museums cannot be too numerous or

[663] Ibid., 113-114.
[664] Knox 1836, v emphasis mine.
[665] The collection Knox referred to was likely James Wilson's. I am unsure if the reference to 'Cruickshanks' is to Hunter's former assistant or someone else. Knox 1836 v-vi.

> extensive. Without museums the profession would be in the state of man without a language.[666]

But in order to collect disease, much care and specific knowledge was needed. In his explanation of how to prepare diseased bones, Knox noted that errors or carelessness in preparation would confuse the viewer: "The vertebrae, when allowed to lie for months in water, assume an appearance so like caries that I have seen an excellent pathologist mistake such for a morbid state of the bone". Care was required for other reasons too. In cases of scrofulous caries, the "portions of osseous texture often die, and being loose, are in danger of floating away with the water whilst washing the preparation"—vital information it was precisely the purpose of the anatomist to preserve.[667] In the same section, Knox gave an authoritative list of how specific diseased appearances ought to be preserved. Old fractures, rickets, caries, and exostosis, for example, were to be made as dry preparations, whilst recent fractures, cancer, and fungus haematodes ought to be wet. If necrosis was recent, that had also to be preserved wet and injected.[668] By the 1830s then, the collecting of morbid anatomy preparations was developed to the point where such lists—authoritative regarding morbid appearances as well as their best preservation—could be made. From the experiments of Hunter and Baillie, practitioners were now experienced in the collecting of morbid anatomy. Morbid anatomy had become embedded within the practice and institutions of nineteenth century Britain.

5.4 Conclusion

Morbid anatomy constituted a British approach to the study of disease that was anatomically based, and separate from the developments in Paris in the early nineteenth century. British practitioners used and extended Baillie's *Morbid Anatomy* and in doing so, created a native anatomical approach to the study of disease that supported local institutions and that they then defended against the importation of French pathology and its implied structural change. My argument is a major new interpretation of the development of anatomical approaches to the study of disease in the early nineteenth century, as it places Paris within an international context where anatomy became central to efforts at better understanding disease across countries, tied to separate institutional structures and teaching practices. Historians have prioritised Paris because of the clinical elements of the practice there, but in nineteenth-century Britain, morbid

[666] Ibid., vii author's emphasis.
[667] Ibid., 89.
[668] Ibid., 90-91.

anatomy was predominant and the developments in Paris were viewed with caution. This has the effect of refocusing the questions historians will have to ask about the development of anatomical approaches to disease around the interactions between different locations and methods, rather than assuming the importance of Paris.

In this chapter, I focused on outlining the practice of morbid anatomy in Britain, which, as we saw, was fundamentally reliant on the foundation put down by Baillie's practice and publication. Anatomical teaching incorporated lectures on and preparations of morbid anatomy, just as authors used Baillie's descriptions and extended the number of images of disease rendered in print. At the same time, I have not focused on Baillie's work, but that of a wide variety of practitioners. This has had the effect of both providing a sound grounding for my claims regarding the importance and ubiquity of morbid anatomy in the study of disease during the period, but also emphasised that Baillie's work was used in ways that went quite beyond the scope of *Morbid Anatomy.* Most obvious in that regard was morbid anatomy's use as an important aspect of the conservative reform movement in Britain. Morbid anatomy was seen by contemporaries as an important point of unity between physic and surgery that might enable better differentiation between diseases that ought to be treated by medicine or surgery, whilst also leaving the structures and institutions of British medicine unaffected.

British morbid anatomy is thus an area of early nineteenth century medicine that requires much further investigation in order to clarify its scope and limits, as well as its relation to the study of disease in the rest of Europe. Central to this will be greater investigation into the pedagogical practices relating to disease in Britain in this period. In his work Maulitz argues that the projects of French-inspired British 'pathologists' such as Douglas Carswell and Thomas Hodgkin failed, and puts this down to British obstinacy regarding the developments in Paris.[669] But both men's work was clearly inspired in at least some respect by British traditions: Carswell worked to produce a full-colour atlas of diseased appearances; while Hodgkin's book was entitled *Lectures on the Morbid Anatomy of the Serous and Mucous Membranes* (London 1829). Might their work be one of failed integration rather than failed introduction?

More broadly, we might consider the influence of morbid anatomy on larger schools than the single-proprietor model of the Great Windmill Street school as it was under Bell. The anatomy school at Guy's Hospital, for instance, organised its collection in a manner that was

[669] Maulitz 1987, 211-214.

strikingly similar to that of Baillie's, and was an early pioneer in London of routine post-mortem examination of the deceased in a hospital setting (an import from Paris).[670] What influence did this have on the work of Richard Bright? Working at the hospital, he published a number of his papers on the kidney in *Guy's Hospital Reports*, a periodical that worked to demonstrate and encourage inquiry into subjects such as disease at the hospital. His major work on the kidney then contained a number of full-colour illustrations of diseased kidneys, which played a central role in his definition of what later came to be known as Bright's disease. As the stethoscope was for the Paris school, might Bright's disease be the culmination of the practice of morbid anatomy in nineteenth century Britain then?

[670] Alberti 2011, 77-78, 138-139.

Chapter 6: Conclusion

In 1833 *Tait's Magazine* summarised the impact of *Morbid Anatomy* in Britain: "The first edition of Dr. Baillie's celebrated Treatise on Changes of Structure was published upwards, we believe, of forty years ago; and has continued to be regarded as the text-book on morbid anatomy to this day".[671] From one of numerous approaches to the study of disease in the eighteenth century, morbid anatomy had become a practice that was central to British work on disease in the nineteenth century. At the Great Windmill Street school Matthew Baillie had taken an anatomical approach to the study of disease that eschewed case history narratives—the typical way of studying disease in the eighteenth century. His approach emphasised the tactile and visual information found in the diseased cadaver at dissection, the methods of which were expanded by the use of preparatory techniques and the making of preparations. In different publishing contexts, Baillie represented his findings differently: in periodicals he presented case histories, whilst his book was a work in the instructional anatomical description genre. *Morbid Anatomy* worked to define and promote Baillie's anatomical approach to the study of disease, but was initially criticised at home and abroad. His second edition addressed these criticisms whilst maintaining the work's original intentions.

By publishing illustrations of diseased appearances in *A Series of Engravings* (1799–1803) he extended the scope of this work further. To do so, Baillie worked with specialist artists and engravers to make printable images of diseased appearances that were epistemically acceptable to his audience and enhanced specific features of the preparations depicted. Baillie's publications and his personal example as a practitioner then became a resource central to the British study of disease in the early nineteenth century: authors writing on disease employed Baillie's descriptions for their own works; new printing techniques were used by anatomists to render the textures and structures of the diseased body in other works of 'morbid anatomy', extending the scope of Baillie's initial illustrations; practitioners built up medical museums through collecting morbid anatomy preparations used for teaching morbid anatomy as part of anatomy. In short, by 1833 morbid anatomy was a subject for which a 'text-book'—a new genre of pedagogical publication—was necessary, and Baillie's book was necessary for it. In the nineteenth century morbid anatomy was a distinct British approach to the study of disease that developed concurrently with the very different approach that had emerged in Paris around

[671] Tait (ed.) 1833, 122.

1800. It had originated in the practice of anatomy at the Great Windmill Street school, and the presentation of anatomical works on the subject of disease by Baillie.

I have therefore outlined in this thesis a major new interpretation of the development of anatomical approaches to the study of disease at the turn of the eighteenth century in this thesis. Rather than a practice local to Paris and related only to consequences of the specific institutional changes there, the anatomical study of disease, including at the level of tissues, was in fact widespread across Europe in the period, but uniquely constituted in different locations. Not only did Baillie articulate morbid anatomy as a coherent mode of studying disease, it was understood as such elsewhere in Europe. That fact that Samuel Thomas von Sömmering, for instance, both grasped and was able to extend Baillie's work almost immediately (though not necessarily to Baillie's liking) emphasises this point. By contrast, when Baillie's work was translated for the second time into French in the early nineteenth century, it was modified to fit the local context: the term 'structure of the parts' was translated as "le tissu" in M. Guerbois's translation.[672] The use of and interest in Baillie's work in different international contexts is suggestive of a wider and more fundamental change in the study of disease than that outlined by scholars focused on Paris. Perhaps anatomy, as the most 'successful' experimental discipline in medicine in the eighteenth century (as Cunningham has argued), came to be viewed as a particularly promising avenue for inquiry into disease in comparison with other potential avenues. As I argued in Chapter 1, approaches to the study of disease in the eighteenth century were characterised by heterogeneity, but did this continue into the nineteenth century? Certainly, in Paris what came to be termed pathological anatomy was central to the study of disease by the mid-nineteenth century: what of elsewhere?

In addition, I have argued that morbid anatomy was a particular way of working and of knowing disease, rather than a discipline in its own right. This approach was developed in its first articulation at the Great Windmill Street school of anatomy. There Baillie learned anatomy as a practice concerned with gaining and preserving experiential knowledge of the cadaver through the senses. Morbid anatomy was therefore a practice that involved various kinds of expertise: knowledge of materials and procedures, skill in executing different tasks, and organisational ability to facilitate the making of preparations and the cataloguing of the collection. Much more than simply an intellectual endeavour (though it was that too), morbid anatomy was a kind of work, a way of working with diseased bodies in the attempt to extract

[672] Keele 1998, 123. Thanks to Emily Herring for her help in clarifying this point.

as much information from the scarce resource as possible. In examining ways of working and knowing, I have built on John V. Pickstone's definition of forms of knowledge following particular practices by showing that the practice of morbid anatomy was centrally important to wider developments that came to be relevant to later disciplines. Though this thesis has not been a disciplinary history of pathology, it is nevertheless relevant to that history, just as it is to the history of anatomy as a discipline, as well as the understanding of the patient encounter in the late Georgian period. In this way, morbid anatomy as it was articulated by Baillie might be compared with other developments in the same period that pertain to a wider scope than only that of anatomical approaches to the study of disease: what of the role of chemistry in the study of disease in this period, for example? What of other practitioners like James Carmicheal Smyth, whom Othmar Keel views as a key figure in this period?[673]

Central to both of these arguments has been the making and circulation of books, both illustrated and text-only. Not only were they vital in promoting the practice of morbid anatomy, they were vital in shaping it, including through its further representation in other works on the subject. Furthermore, the practices involved with making books—both in terms of how Baillie presented his work and how others worked to make illustrations represent anatomical knowledge—were vital to the articulation and epistemic reliability of morbid anatomy as a practice. Thus, my thesis has contributed to the historical understanding of both pathology and anatomy, in part by attending to aspects of book history. In the remainder of this conclusion, I discuss these contributions in turn.

6.1: The Study of Disease in the Eighteenth Century

During the period in which Baillie practised morbid anatomy and produced *Morbid Anatomy*, there was no unified discipline of pathology. There had been such a discipline, that of library pathology, and there would be one again after the instigation of histology in the mid nineteenth century. Thus, the study of disease was both post-disciplinary and pre-disciplinary in this period; approaches to the subject in the eighteenth century were characterised by heterogeneity. But there were methods and practices that were common across the study of disease in this period. It seems that there was an increased interest in the empirical study of disease: both anatomy and chemistry—empirically-minded methods of study—were prominent approaches through which disease was studied. At the same time, it is also notable that in important aspects

[673] Specifically, he claims that Pinel, Bichat's teacher, plagiarised Smyth. Keel 1998, 134.

of practice much work on disease remained library-based. Consistent throughout this period, for example, was the writing of case histories by practitioners as a tool for the improvement of various aspects of medical practice. The writing of cases provided a common narrative structure to what were otherwise disparate patient encounters, enabling systematic contrast and comparison across cases by authors. As I demonstrated in Chapter 2, Baillie was able to write his morbid anatomy work up as a case, which had the effect of incorporating Baillie's very different practice within a set of norms and conventions regarding medical practice's improvement.

At the same time, I have shown that the practice of dissecting diseased cadavers, which has been seen by historians as consistent across the period of my study, in fact changed significantly through the promotion of morbid anatomy. The dissection of diseased cadavers as part of case history narratives with the goal of anatomico-symptomatic correlation was a practice that had been widespread—though due to logistical reasons not necessarily common—from at least the seventeenth century, probably earlier. The very fact that Théophile Bonet was able to produce *Sepulchretum* in the seventeenth century shows that post-mortem examination of cadavers was viewed as useful and worthwhile by a range of practitioners in different locations at the time. That Giovanni Battista Morgagni and Joseph Lieutaud both produced works that expanded on the number of dissections collated in the eighteenth century emphasises that this was a longstanding practice. Crucially, the product of this practice was written, and enabled the post-mortem examinations to be incorporated into library-based work on the physician's practice.

Baillie's practice was fundamentally different from this. Though Baillie was physically engaged in a similar sort of practice by dissecting diseased cadavers, he did so focused on the preservation of information that was relevant to anatomy. Instead of case histories, Baillie was engaged in an anatomical practice in a pedagogical context focused on retaining anatomical information in preparation and text. That information was sensory—tactile and visual—and not concerned with the narrative of patient encounters. It was, however, concerned with a kind of narrative—that of the body's functions in disease. Baillie's conception of morbid anatomy as the basis for the understanding and investigation into morbid action mirrored the relationship between anatomy and physiology that William Hunter had advocated at his school. Thus, Baillie's approach to the study of disease was anatomical in the sense that it stemmed from and utilised the practices and concepts of anatomy. Whilst dissecting diseased cadavers was

consistent across both post-mortem examination for the writing of case histories and morbid anatomy, it was practised for different purposes with different outcomes in these two contexts.

As morbid anatomy was taken up as a practice in Britain around the turn of the eighteenth century, the way that information found at dissection was treated by practitioners changed. Previously, authors of case histories had noted all deviations from regular anatomy found at post-mortem. In *De sedibus* Morgagni had attempted to relate these singular instances and examples of disease to one another in order to correlate the findings made at post-mortem with the patient's symptoms. But it was often difficult to discern the relevant changes in structure from individual bodies, even when compared with one another. By contrast, in *Morbid Anatomy* Baillie simply presented his descriptions as generalised knowledge, obscuring the material basis for his claims—messy, individual cadavers made into a collection—in order to avoid distraction from his claims. As I demonstrated in Chapter 5, one of the effects of this change was that some of Baillie's descriptions became canonical, such as the description of the diseased appearances attendant on the croup. Specific diseased appearances thus became viewed as regular by practitioners, which when encountered at post-mortem firmly pointed to a specific diagnosis.

The uptake and expansion of the methods and scope of morbid anatomy by authors in the nineteenth century therefore increased generalised knowledge of diseased appearances related to specific diseases. These methods incorporated experimentation with new printing technologies used to render the variety of the structures and textures of the body sufficiently. As I suggested in the conclusion to Chapter 5, Richard Bright's work on identifying and defining what came to be called Bright's disease might be considered morbid anatomy's equivalent to Laennec's invention of the stethoscope for Parisian medicine: the crowning achievement of a particular type of approach to the study of disease. In Bright's case, the institution of Guy's Hospital, which had its own medical museum, provided a material basis for Bright's investigation that he then presented in full colour. Central to Bright's work was the visual and tactile identification of diseased kidneys that he worked to correlate with his newly defined disease entity, presented as such through illustration in a work on the subject of disease.[674]

Furthermore, by outlining the British practice of morbid anatomy in the nineteenth century, I have also answered Russell Maulitz's criticism of British practice in the period.

[674] On Bright see: Bertoloni Meli 2017, 166-176.

Rather than simply being traditionalists uninterested in reform, British practitioners who opposed the importation of the French style of pathology were in fact defending their own, uniquely constituted practice. It was simply not obvious what benefits the French style had ahead of the British style. Morbid anatomy was viewed a practical way of investigating disease that was not disruptive of the structures and hierarchies of medicine in Britain in the way that the importation of Parisian medicine suggested. As it had been incorporated into anatomy, it therefore contributed to conservative reform efforts in Britain, which aimed at keeping the character of British medicine intact whilst improving its teaching and practice.

6.2: Making Anatomical Knowledge in the Eighteenth Century

The relation between anatomy and the study of disease was crucial for the work of Baillie and his contemporaries. Most significantly, morbid anatomy was an anatomical practice precisely because it prioritised anatomical modes of thinking about the diseased appearances of the body and employed anatomical methods and practices in order to investigate the diseased cadaver. That morbid anatomy was fostered at the Great Windmill Street school was significant in the practice's performance and its intellectual content. Not only had Hunter learnt and developed the latest preparatory techniques in order to create the school's collection, he had also taught these techniques to his students precisely because that was how he experimented with cadavers in order to create anatomical knowledge. The techniques increased the range of sensory experiences, both tactile and visual, that the anatomist had with the cadaver, and thereby worked to produce experiential information for the anatomist who had intimate knowledge of the structures and textures of the corpse. Such work could be applied to the diseased cadaver just as to the regular one. This knowledge was then preserved in various ways at the school, primarily in text and preparation, in order to retain as much information from cadavers as possible. Crucially for Baillie's work, the retention of preparations of diseased parts worked to increase the scale on which comparisons between diseased appearances could be made, providing a grounding for his generalised claims about disease. Furthermore, Baillie's conceptualisation of his project was fundamentally grounded in Hunter's conception of the relation between anatomy and physiology. Just as anatomy was the proper basis for grounding reasoning and claims about the functions of the body for Hunter, so Baillie promoted morbid anatomy as the grounding for the understanding of morbid action. Baillie's location within Hunter's anatomy school, complete with its attendant collection, was thus central to the entire project of morbid anatomy.

As a result, Baillie's work reveals much about the practice of anatomy in the eighteenth century, especially as it was practised at the Great Windmill Street school. Firstly, it emphasises that the pedagogical context of the school was crucial to much of the work that took place there. Not only were there practical reasons for this—the organisation of the school to encourage graverobbing, and then make best use of the cadavers it provided—but intellectual ones too. Baillie's conceptualisation of his project was an extension of Hunter's views on anatomy. Historians have been attentive to the relation of anatomists' work to their specific working conditions in the eighteenth century. As Andrew Cunningham argued, whilst there was a unified discipline of anatomy in the eighteenth century, there was little by way of infrastructure in which this work took place, with pedagogical contexts providing a crucial source of income for anatomists.[675] However, my thesis has emphasised the intertwined nature of anatomical inquiry and anatomical pedagogy. Much more than an important practical necessity, the inquiry of anatomists in the eighteenth century was shaped by their need to attract students. In certain circumstances, their offer to students changed over time as a result of practical circumstances. At first, Hunter's offer was unique largely in terms of providing bodies for students to dissect, but later it was unique in terms of the scale of the collection and the discoveries communicated there. The creation of anatomical knowledge thus had a direct economic imperative that requires historians to contextualise such work within everyday processes and practices.

The making of preparations was one such practice. Throughout the thesis I have emphasised that preparations were a crucial resource for Baillie's work. Not only did they preserve otherwise ephemeral structures for future observation, their making was central to the knowledge produced at the school. Moreover, the use of preparatory techniques and the making of preparations—complex and difficult tasks—were rendered routine by the facilities that the school provided and its organisation in making use of its major resource: corpses. Every cadaver was an important resource, so much effort was made to maximize the utility of the corpses. It was therefore routine for the cadavers dissected at the school to be experimented on by students and practitioners—simultaneously this made best use of scarce resources and was a major attraction for the school. Through experimentation with the cadaver, students and practitioners became technically proficient in the use of tools and techniques, as well as the materials that were used to explore the body. Those materials were everyday (like wax) and esoteric (like mercury); tools were specially made for anatomists (such as injection tools) or specially used by them (such as glass jars). Their use involved the mastery and application of

[675] Cunningham 2010, 17-82.

techniques that required the anatomist to conceptualise wax, for example, as being able to reveal the structure of the vessels through a certain series of procedures as well as the ability to do so. By the time that Baillie's career in London began, these techniques were well-known, but regular experiment with preparatory techniques on cadavers was still located in institutions such as Hunter's that organised themselves using them. Old technologies like preparations thus remained contingent on specific organisational circumstances and so remained an important avenue of experimentation in the pursuit of anatomical knowledge over a century after their initial development, especially as more destructive experiments with cadavers was enabled precisely by collecting. If the eighteenth century was indeed a 'century of things' as several scholars have advanced, it was also a century that prioritised making the best use of things.[676]

In that regard, the museum collection at Great Windmill Street was particularly well-used by Baillie. It was a crucial source for his work, as I have shown through linking specific preparations and groups of preparations to descriptions in *Morbid Anatomy.* The work thus grounded specific claims regarding morbid anatomy in the museum collection. But it was important in other ways too. Baillie referred to his unparalleled access to the collections in order to make his work epistemically authoritative. He also illustrated the museum's preparations in order to represent morbid anatomy in print. The repeated use of the collections Baillie had at his disposal in different ways emphasises not only that it was important physically—as a physical space and physical record of anatomy—but as an intellectual resource through which morbid anatomy could be better explored and considered. Crucially, the use of these collections was presented in anatomical publications.

6.3: Publishing on Disease in the Eighteenth Century

Morbid Anatomy was a publishing success. Presented as an anatomy book on the subject of disease, the work was both conventional in terms of its form and innovative due to its specific subject. In the late eighteenth century, entrepreneurial publishers who specialised in medicine were interested in products like Baillie's precisely because of the potential market. Text-only anatomy books were a popular product, often going into multiple editions, their perceived utility complemented by their cheapness which enabled any practitioner to be able to afford them. By contrast, illustrations were less common and usually published for different purposes,

[676] See: Guerrini 2016, 469-480.

such as to enhance the reputation of the author.[677] Baillie's *A Series of Engravings* was presented by him as part of the same project as his text-only work, and was similarly a work of anatomy on the subject of disease. Both books were therefore of the same genre, that of the instructional anatomical description, though differently instantiated. The take-up and extension of features of Baillie's publications in morbid anatomies published in the nineteenth century demonstrates the importance of this presentation for the overall impact of the work. Other authors imitated Baillie's publications in writing their own, which worked to embed morbid anatomy as central to British approaches to the study of disease in the period.

The manner of presentation was, however, only one aspect of how epistemic content was made meaningful to and accepted by contemporaries. There was a 'communication circuit' between the various actors concerned with Baillie's publication that worked to construct the meaning of morbid anatomy in Britain in the nineteenth century. Alongside Baillie's careful presentation of his work, publishers and artisans who made illustrations worked to ensure Baillie's work was epistemically acceptable. In addition, criticism saw Baillie modify the work to make it more acceptable to his contemporaries, whilst ensuring the original purpose was maintained. The ability of readers to comprehend Baillie's work rested on the norms of the instructional anatomical description genre. By employing the features of anatomical works for his own publication, Baillie ensured that the kind of work and knowledge presented was viewed as anatomical and no longer tied, as had been conventional, to the patient's narrative that incorporated symptoms. Moreover, as the example of Sömmering's translation shows, this worked across international boundaries and languages—perhaps a further demonstration of Cunningham's argument that anatomy was an internationally united discipline.

Publication was therefore central to the presentation and epistemic acceptance of anatomy in the eighteenth century. By making this argument, I have related the history of anatomy, already blurred with art history, to that of book history, expanding the overall scope of historical investigation into anatomy. I have done so in two ways that provide important historiographical clarifications about the development of practices such as morbid anatomy more widely. First, through making use of Gianna Pomata's definition of epistemic genres, I have demonstrated that practitioners could employ genres through the features associated with them to challenge norms regarding publication and practice. Initially Baillie published in case histories, but after his publication of *Morbid Anatomy* the anatomical study of disease in Britain

[677] Berkowitz 2015b, 171-208.

became more widespread, in part due to its articulation through further publications of morbid anatomy by other authors. This serves to foreground the form of medical, and scientific, publications as important sites of negotiation in the attempt to improve practices.

Secondly, my demonstration that text-only works of anatomy were much more popular than illustrated works through my preliminary analysis of the *English Short Title Catalogue* suggests that such works were in fact much more influential in the practice of anatomy than illustrations. Hitherto, historians have prioritised illustrations in the history of anatomy, ahead of a more complete picture of how contemporaries actually engaged with anatomical works. Going forward, a more complete picture of anatomy in the eighteenth century will need to consider the role and import of text-only works alongside that of illustrated ones.

Nevertheless, illustration was an important aspect of publication for anatomists. Not only did it work to emphasise the importance of the visual in anatomical work, but it also cemented the reputations of authors. But, as I argued in Chapter 4, the publication of illustrations and their epistemic content—their ability to embody 'truth-to-nature'—was contingent on the co-production of them by a variety of practitioners, in addition to anatomists, which significantly shaped the representation of anatomy through the hand-press era of print. This strongly links the development and publication of illustrations to the processes and artisanal skills of the various practitioners who worked to make Baillie's printable images of diseased appearances. In emphasising the reliance of illustrations' content on artisans' expertise, I argue that Lorraine Daston and Peter Galison, in their description of truth-to-nature, have incompletely characterised whom it was that epistemic authority relied upon. Rather than demonstrating the author's credentials and epistemic reliability, truth-to-nature demonstrated the group's credentials and epistemic reliability. It was no coincidence that William Clift, James Heath, and James Basire II reappeared in my narrative when working on illustrations for Everard Home and Alexander Monro tertius—they became practitioners who were in demand for natural philosophical publications because they had demonstrably been able to represent anatomical findings sufficiently well.

6.4: Some New Directions

This thesis has therefore suggested a new narrative of the history of pathology, and has suggested new directions for study in the history of anatomy, especially as it relates to book history. As a final comment on the importance of my thesis for the history of medicine more

generally, I will discuss potential areas for future projects in the final paragraphs, suggesting new directions of study related to my own work.

First and foremost, a comprehensive study of British morbid anatomy will help to clarify and to detail the argument in Chapter 5 that morbid anatomy constituted a distinctive, local approach to the anatomical study of disease that occurred concurrent to the developments in Paris. This will help to create a wider, international context for the shift towards anatomy in the study of disease in this period, suggesting further avenues for research. One such avenue will be to track more fully the links between Britain and France, Britain and Germany, and France and Germany, as well as those locations and the rest of Europe (Italy especially) to fully gauge the extent of the turn towards anatomy in this period. Further important points of comparison arising from this will be the position of America in these developments, as well as the impact on empire and imperialism this turn to anatomy had.

In regard to the expansion beyond the borders of Europe, the relation between the centre and periphery brings to the fore questions regarding the type of bodies that were dissected by anatomists: were the bodies of the European poor seen as equivalent to those in other parts of the world? If they were different, what impact did this have on how 'natives' and the diseases in those parts of the world were viewed? Similar questions can be asked of those bodies at home. Most significantly, scholars have shown that the female body was pathologized in this period. Anatomists like Sömmering emphasised the differences between the male and female skeleton, whilst the difficulty associated with studying the pregnant body ensured that pregnancy was pathologized.[678] For his part, on occasion Baillie noted the differences between diseased appearances in male and female bodies—what was the effect of this in the treatment of disease for women?

Above all, the expansion of the Paris narrative to include the rest of Europe will work to raise new questions concerning the development of pathology in the nineteenth century, and what that development ultimately rested on. That an anatomical approach which, as Keel argues, incorporated a concern with tissues arose concurrently with but separate from the well-known developments in Paris suggests that the importance of the specific institutional changes there have been overplayed. At the same time, there were very different characters to the practices of morbid anatomy and the 'clinic', accompanied by different outcomes. If my proposal that Bright's disease was the British equivalent of the stethoscope is correct, then the

[678] Schiebinger 1986, 42-82; Schiebinger 1990, 387-405; Massey 2005, 73-91.

importance of overarching approaches that manifested distinctively in different locations seems to be significant in the development of knowledge. There was not one area of innovation that influenced all others, but rather a wider, European interest in anatomical approaches to the study of disease, which manifested itself through specifically located but nevertheless related innovations.

Another project suggested by this thesis is one that explores text-only works of anatomy from the early modern period to the nineteenth century. These significant but overlooked works of anatomy seem to me to offer much potential for understanding the practice of anatomy as it was for most practitioners, and how that fitted into their everyday work. It will also help to clarify the relations between the authors of such work and the publishing industry. Who advocated such works? Did publishers seek out anatomists looking to make money from writing such works, or the other way around? Were text-only works preferred by publishers ahead of illustrated ones? And what role did illustrations have in relation to such works? Moreover, focusing on the audiences for these works might provide important insights into the wider concern with anatomy in the period. Did interest in these cheap works go beyond those involved in medicine? If so, who was interested? And if not, who in the profession particularly used or relied on these publications?

Both of these projects would work further to elucidate Baillie's work. As *Tait's Magazine* outlined, his work was central to the practice of morbid anatomy in Britain even after his death in 1823. From the dissection table, Baillie had articulated and promoted in print an anatomical study of disease that, beyond his own work, became the main approach to the study of disease for British practitioners in the nineteenth century.

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