Disciplining Medicine: Science and the Rhetoric of Medical Education Reform in Britain, 1770-1858

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Dedication

For Douglas, Collin and Miles

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Chapter One

Introduction

Medical education evolved significantly in Britain between roughly 1770 and 1858. The doctrines established by medical teachers in the late eighteenth century not only revised or overturned received theories of disease, physiology, and therapeutics, but also entailed new approaches to instruction. In Britain, this evolution was initiated in Scotland, which had established medical schools in the early and middle part of the eighteenth century. These schools and their leading teachers would gain considerable fame for championing a medical curriculum oriented toward a system of instruction that privileged the demands of a new class of "general practitioner" and firmly established scientific and clinical approaches to teaching medicine. In contrast to the traditional philological and humanistic orientation of the medical education at Oxford and Cambridge, this new approach to medical training emphasized observation, empiricism, and an organized system of clinical observation. Institutions throughout Britain began to adopt the model offered by Edinburgh's medical school. Though this process met some resistance, by the mid-nineteenth century the new scientific perspective had displaced the traditional humanistic paradigm and pedagogy. Many of the innovations initiated in the Scottish medical schools would be inscribed in the major nineteenth-century British Acts of medical reform, documents which demarcated boundaries between professional categories, set standards for medical education and licensing, and defined and regulated

various forms of medical practice – in short, the reform Acts (re)defined the field and discipline of medicine.

In this dissertation I consider a set of discourses that appeared in Britain between roughly 1770 and 1850 that articulated this new understanding of medicine and promoted a spirit of reform. Focusing on documents addressed to questions of pedagogical method, curricular emphases, and doctrinal disputes, I identify the chief arguments, assumptions, and aspirations that motivated and justified innovations in the teaching of medicine at specific institutions and promoted broader, sweeping reform of the whole system of British medical education. Many of the significant specialist controversies, social upheavals, and institutional developments from the period of reform in nineteenth-century Britain have been well documented by historians of medicine, but these scholars have not considered the discourses that acted as catalysts for medical education reform in terms of the rhetoric of disciplinarity. Meanwhile, rhetoricians of science and medicine, always attuned to questions of disciplinary definition and differentiation, professional status and authority,[1] have done only a little work on medical science in this period and none focused on medical education.[2] I attempt to position this study as a contribution to both of those fields.

This study encounters British medicine and medical education in the wake (or aftermath) of the scientific "revolution" traditionally dated to the seventeenth century.

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[1] For a sampling of statements and studies addressing the rhetoric of definition, differentiation, and status in the sciences and medicine, see, e.g., Lyne and Miller 2009; Taylor 1996; Locke 1992; Fuller 1991; Holmquest 1990.

[2] Of the rapidly growing body of work in the rhetoric of medicine, health/illness, and medical care, only a few studies address medical thought or practices from this period (e.g., Berkenkotter 2008) and very few historically oriented studies focus on formal medical education in any period.

Natural philosophy had transformed into natural *science*, and scientific inquiry into nature and natural processes was increasingly identified with ever-improving techniques of empirical observation and measurement, experimental method, new taxonomic systems, and conformity with newly established theories or laws of physics. Connected as it was to the sciences of botany and chemistry and to the study of anatomy, medicine had by the seventeenth century taken on a more scientific cast.[3] A central question for the study is how the advances in the emerging science (or sciences) of medicine, and the scientific method itself, were accommodated in the formal education of medical practitioners, especially the training of physicians in the university-based medical schools of eighteenth and early nineteenth century Britain. I will contend that this accommodation was reflected in both teaching methods and educational curricula at the new/progressive medical schools (first in Scotland), and that it entailed the inculcation, in students, of habits of mind and attitudes towards practice profoundly different from those acquired in the training received at the older institutions of Oxford and Cambridge.

A second question follows from the first: To what extent were the major reform acts of the nineteenth century a response to the rise of medical science and the new, scientific medical training adapted to it? Here I will identify the success of the educational model established first at the Scottish universities (especially Edinburgh).

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[3] Often I will use the term "science" interchangeably with the new experimental science that developed out of the seventeenth century. (A side note to this is to recognize that what we call "science" in the pre-modern period was termed "natural philosophy.") Claude Bernard, in *An Introduction to the Study of Experimental Medicine*, defines this biomedical science positing, "it is … clear to all unprejudiced minds that medicine is turning toward its permanent scientific path. … [I]t is little by little abandoning the region of systems, to assume a more analytical form, and thus gradually to join in the method of investigation common to the experimental sciences. … [E]xperimental medicine must include three basic parts: physiology, pathology, and therapeutics" (1). Newman explains that during this period, "the conviction that science might be applied to medicine with results as wonderful as those which had already been achieved in technical spheres produced a revolution" (1957, 57).

The discourses that articulated this educational model circulated widely and not only influenced public attitudes toward reform, but also had a decisive impact on the debates that culminated in the acts.

These two questions focus on the relationship between medical science and medical education. However, they fail to address a third key variable: healing practice. No one would deny that the teaching of medicine, "the art of healing," ought to address practice as well as theory, techniques along with taxonomies. Medicine is a practical art, not a theoretical or "pure" science. As this fact will always place special demands on medical education, which should strive to convey reliable scientific knowledge of biological processes, disease, etc. *and* to promote the acquisition and improvement of relevant practical knowledge. I do not here consider British healing practice(s) of the period in detail, except in so far as it bears on the question of medical training and related issues like professional credentialing through formal education. However, I do need to clarify that the aspect of practice is essential to my conception of the *discipline* of medicine, which holds closely to the Latin root of the term: "instruction, teaching, learning."[4] Healing practice and scientific knowledge are both aspects of medical education, and thus constituents of medicine's disciplinary identity or "disciplinarity." When the teaching of a subject is pressured, challenged, transformed, or reformed – as was the case of British medical education in the later eighteenth and nineteenth centuries – it would seem to be an important catalyst for disciplines to define, promote, establish

[4] *Disciplina* "instruction given, teaching, learning," also "object of instruction," from *discipulus* ("pupil, student", from a lost compound **discipere* "to grasp intellectually, analyze thoroughly," from *dis-* "apart" + *capere,"*to take, take hold of" [as in *capable*]).

and, if necessary, defend or reaffirm disciplinary status. "The only way in which a discipline can establish itself is through rhetorical self-affirmation" (Cahn 1993, 63). In this sense my study is an investigation of the rhetoric of disciplinarity.

Numerous studies have demonstrated that rhetoric is required for the creation, maintenance, and promotion of disciplines, including even the sciences.[5] The need for rhetoric – argument, persuasion – is especially acute in the case of disciplines which endeavor to align abstract, theoretical knowledge with competence in situated practice or performance. The two prime examples of such disciplines are medicine and rhetoric itself, and a brief account of historical and conceptual intersections between medicine and rhetoric will allow me to isolate some considerations that will help establish a theoretical context for my study. After a discussion of ancient intersections, I will consider some important scholarship that has discussed the common ground of medicine and rhetoric from the Renaissance up to and through the Enlightenment, and has helped guide my analyses of the discourses of British medical education reform. I then present a brief survey of the reform period itself, laying out a basic historical context that will be considered in more detail in Chapter Two. I conclude this Introduction with a summary of the other chapters of the dissertation.

Early Rhetoric and Medicine: Challenged Disciplines

The association between rhetoric and medicine dates to the Greek classical period – indeed, to the very time when each emerged as a subject of specialized study. The earliest works of the Hippocratic corpus, like the earliest works of technical rhetoric, date

[5] Harley 1999; Lyne and Miller 2009

to the fifth and fourth centuries BCE. In the same period we have evidence, for both arts, of systematic instruction involving long-term study with a master theorist-practitioner. Nevertheless, despite the development and refinement of both theory and pedagogical methods, medicine and rhetoric were both forced to answer charges of insufficiency. The close affiliation between rhetoric and medicine was expressed in a set of overlapping practical and theoretical concerns that were intimately bound up with the question of each field's status as a coherent discipline or, as the Greeks would say, as *techne.* In both rhetoric and medicine this status was disputed, and in both the questions that fueled the dispute prompted close self-examination and brought forth what Michael Cahn has called a rhetoric of disciplinary self-affirmation (Cahn 1993).

As Cahn observes, rhetoric's assertion of its status as *techne* often took the form of comparisons to fields whose disciplinary status was—or was intended to be taken as being—unquestioned (70-1). Significantly, the example of medicine was invoked by far the most persistently. An early instance of this strategy of defending rhetoric by comparison with medicine is suggested in the sophist Gorgias' analogy between the power of words (*logoi*) and the potency of drugs (*Helen* 14). In Plato's dialogue named after the sophist, Gorgias' comparison of rhetoric to medicine returns in a somewhat exaggerated form, where he claims that the power of the *techne* of rhetoric is in fact *greater* than that of all other skills, and specifically that of medicine (456a-c).[6] Similar analogical comparisons of rhetoric to medicine would reappear persistently in the fourth

[6] The drawing of comparisons to medicine seems to have been a sophistic penchant. Schiappa (1991,198) briefly describes how the analogy with medicine functions in such a way for Protagoras.

century—notably, in the work of Aristotle[7] —and would remain a significant *topos* in the justificatory arguments of the most influential rhetorical works of later antiquity, those of Cicero and Quintilian.[8]

Plato too found the analogy with medicine suggestive and useful, but for the opposite reason -- as a means by which to *discredit* rhetoric. Indeed, medicine stands as an important foil in virtually all Plato's reflections on rhetoric. The analogy is deployed most famously in the critique of rhetoric found in the *Gorgias*.[9] It is quite possible that Plato is deliberately inverting the sophistic argument in defense of rhetoric when, against Gorgias' claims for rhetoric's hegemony over the other arts, and specifically medicine, Socrates argues that because rhetoric cannot specify its subject matter nor propound a method—in short, cannot provide a rationale (*logos*)—it is (ironically) *alogos* and, in distinct contrast to medicine, a "non-art" (*atechnikos,* 465a; see also 500e-501a). Jacqueline de Romilly has accurately summarized Plato's position in the *Gorgias*: "for Plato, rhetoric has nothing to do with medicine … Medicine rests on knowledge, rhetoric does not" (40-1). The favorable opinion regarding medicine Plato expresses in this his most vehement attack on rhetoric's pretensions is elaborated in the *Phaedrus*. In this later work, however, Plato softens his criticism somewhat, granting the possibility of a true *techne* of rhetoric—but with the major provision that its practitioners conduct themselves according to the method of collection and division starting from the determination of first

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[7] *Topics* 3; *Rhetoric* I.2.1.

[8] Cicero, *De inventione* 1.6; *De oratore* 2.44.186; Quintilian, *Institutio oratoria* I.10.6; II.17.9, 25, 39; II.18.41; II.21.11; III.2.3; III.6.64; IV.2.84; VI.4.19.

[9] Examples and/or analogies drawn from disease, medicine, and medical practice pepper the dialogue; see, for example, 448, 449-450, 452, 455, 459, 460, 464, 465, 467, 477, 478, 479, 480, 490, 495, 500, 505, 512, 514, 517, 521.

causes and an analysis of the nature of the soul (269-272b). Significantly enough, Plato invokes the name of "Hippocrates the Asclepiad" as the model theorist-practitioner of this "method" (270b-c).[10]

That rhetoric turned frequently to medicine in efforts to legitimate itself by association with a skill that even Plato acknowledged as constituting a viable discipline suggests that medicine was indeed the first to achieve general recognition as *techne.* Numerous texts from the period challenge this inference, however. There is much evidence provided by the Hippocratic Corpus itself which suggests that Plato's approval of the medicine of his day does not accurately reflect the view of the public at large. On the contrary, it seems that medicine was viewed by many laypeople with the same sort of suspicion that Plato lavished on rhetoric. This is born out not only in the existence of a whole treatise from the late fifth century, *The Art (Peri technes)*, dedicated to the demonstration of medicine's status as *techne* in the face of what appear to be some of the actual charges leveled against it in that early period—that its knowledge was faulty and that its practitioners achieved their successes purely by luck—but also in passages from several other early works that recount popular suspicions of medicine and offer

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[10] Soc. Rhetoric is to be considered the same as medicine.
Ph. How so?
Soc. In both cases there is a nature that we have to determine, the nature of the body in the one, and of the soul in the other, if we mean to be scientific, and not content with mere empirical knack when we apply medicine and diet to induce health and strength, or words and rules of conduct to implant such convictions and virtues as we desire.
Ph. You are probably right, Socrates.
Soc. Then do you think it possible to understand the nature of the soul satisfactorily without taking it as a whole?
Ph. If we are to believe Hippocrates the Asclepiad, we cannot understand even the body without such a method.

arguments to counter these doubts.[11] The prestige of medicine and its status as *techne* was, in short, not as certain as is often supposed. Medicine, like rhetoric, needed a rhetoric of disciplinary legitimation.

Ongoing Affiliations between Rhetoric and Medicine

A full history of the affiliation between the rhetorical and medical disciplines has not been attempted. However, a few scholars have recently tracked this relationship from the early modern period up to about 1800, discovering in it sources for an account of the relationship between theory and practice, the nature of practical arts, and the challenges to traditional understandings of these notions that came with the rise of modern science. The relevant scholarly literature in the histories of rhetoric and medicine reveals three basic affinities between the two arts/disciplines: (1) rhetoric serves as a model for thinking and reasoning in medicine; (2) both arts rely on the deciphering of signs (symptoms) and on conjectural knowledge;[12] and (3) both rhetoric and medicine face the problematic of intervention—rhetoric to persuade and medicine to cure—and the potential failure, fallibility and inexactness inherent to these occasions. These suggest an affinity premised on similar habits of thought and habits of investigation required by particular demands of practice (see Pender 2005a; Struever 1993b, 1995).

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[11] In addition to *The Art*, see especially *Regimen in Acute Disease* 8, 44; *Ancient Medicine* 4, 12. Geoffrey Lloyd treats precisely these treatises in his useful essay, "The Definition, Status, and Methods of the Medical *Techne* in the Fifth and Fourth Centuries" (Lloyd 1991).

[12] See Hutchinson 1988; Ierodiakonou 1995; Poulakos 2004; Wood 1967.

Attention to rhetoric-medicine affiliation provides an important context through which to better understand the medical education reform period in Britain and medicine's disciplinary development. Because both disciplines/arts sought to educate for practice, their affiliation exposes a similar frailty inherent in the theory and practice divide characteristic to both. This frailty manifests within the institutional frameworks in which both disciplines/arts develop historically. To understand the rapprochement and peculiarities between rhetoric and medicine, and to provide an important backdrop for my discussion of medical education's disciplinary evolution, I outline the relevant scholarship on their historical affiliation. Despite their intellectual closeness, during the reform period in Britain, medicine re-organizes and professionalizes institutionally in a way not seen in rhetoric. Medical education in Britain transforms its dominant humanistic-philological and practical-art teaching practices to science-based teaching practices. In particular, medical education reform adopted a progressive educational paradigm that insisted developments in science could secure a sought-after disciplinary status. With science as a new foundation for medicine, a measure of its past institutional insecurity would be eliminated, providing a stronger context for institutional and disciplinary development. Furthermore, the adoption of science-based teaching complicated the theory and practice struggle in medicine as a discipline and practice.

The texts I consider here regularly acknowledge a tension between the human-pracitical side of medicine and the theoretical or "scientific" side of medicine. Hans-Georg Gadamer states that "Even if the application of science enters into all practice, the two are still not identical. For practice means not only the making of whatever one can

make; it is also a choice and decision between possibilities. … Practice requires knowledge, which means that it is obliged to treat the knowledge available at the time as complete and certain. The knowledge known from science is not of this sort" (1996, 4).[13] Indeed, fundamental to the historical practice and development of medical education is recognition of uncertainty that confronts every patient-physician encounter. Analysis of primary texts from the eighteenth and early nineteenth century highlights the persistence of medical practitioners' and educators' engagement with this intractable uncertainty in medicine. I analyze texts such as William Cullen's medical treatises, contemporary medical periodicals, and Parliamentary reports that speak to this confrontation. Furthermore, these discourses demonstrate the value of the experienced practitioner, one who is able to negotiate these difficulties with success. Similar to the skilled rhetor, the skilled medical practitioner practices his art with a higher degree of awareness to the constraints of practical contingencies. Both medicine and rhetoric nourish "resourcefulness, sensitivity to and acceptance of convertibility and reversal of argument and evidence, a readiness to change strategies, premises, and examples" in order to cure or persuade (Struever 1980, 72). One of the key arguments for humanistic medicine is

[13] Gadamer's (1996) further remarks on the tension between the practical and theoretical in science-oriented disciplines: "A rich tradition of this knowledge exists … from the days of Aristotle's 'practical philosophy' to the Romantic and post-Romantic age of the so-called … human sciences. In contrast to the natural sciences, however, all these other sources of experience have a common quality: what we learn from them becomes experience only when actually integrated into the practical consciousness of acting human beings. … The progress of science is sustained by its continual self-correction. And practice which is based on the application of science likewise requires that science further and further improve, by continual self-correction, the reliability of the expectations placed upon it. … Even if the application of science enters into all practice, the two are still not identical. For practice means not only the making of whatever one can make; it is also a choice and decision between possibilities. Practice always has a relationship to a person's 'being.' … Science is essentially incomplete; whereas practice requires instant decisions. The incompleteness of all experimental science thus means that it not only raises a legitimate claim of universality, by virtue of its readiness to process new experience, but also is not wholly able to make good this claim" (3-4).

apprehending the importance of practical interests. Finally, as medical education reform is underway in the early nineteenth century, these discourses take account of the arguments for shifting the modes of inquiry in medical education toward the *science* of medicine as opposed to the *art* of medicine, negotiating this inherent tension with an inclination toward privileging fact/theory over practical experience.

Traditionally, up to the late eighteenth century in Britain, medicine is understood as a distinctly humane art acquired by the practitioner through both experience and a humanistic education.[14] Indeed, medicine is an art as important to maintaining public life as rhetoric. Furthermore, medicine's intimate connection to human affairs necessitates that the physician use practical wisdom to forge knowledge from encounters with particular cases. Important measures of the relationship between rhetoric and medicine are that both arts require schooling in human nature, both arts are practical and interventionist, and both arts apply reason in an attempt to establish probabilities in the face of intractable contingency.[15] In sum, both rhetoric and medicine require similar habits of thought and rely on the same methods of inquiry and principles of "rhetorised

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[14] Important to note is the hierarchy of medical culture in early modern Britain. As Christopher Lawrence points out, "The [Royal] College preferred its members to have an MD granted by a recognized university and it only admitted Oxford and Cambridge graduates to its inner circle, the Fellowship. The physician then, like men of the law or the church, was book-learned. This learning extended to more than knowledge of internal medicine. Physicians regarded themselves as learned in all aspects of the healing art. This knowledge, said the physician, gave him ... the right to oversee all of medicine. The physician considered practitioners of the two other branches of healing, surgery and dispensing, as his manual attendants. In their ideal ordering of medicine, physicians built a structure that valued mind over matter, head over hand, art over artisan, gentility over labour" (1994, 9-10).

[15] Struever outlines, “skepticism was recognized as imperiling intervention. … [w]hat [is] deplored is the failure to practice; the physicians, concluding ‘the impossibility of comprehending the truth about the nature of diseases … suspend judgment, withhold assent, withhold cure.’ … The revival of Hippocrates in the 17th century took place in the context of ‘expectative therapy,’ the therapy of ‘observe, wait, and see” (1995, 291). Furthermore, she states “[the physician] must confront these signs of health and illness with conjectures which will aptly, decorously respond to individual cases” (1993b, 667).

logic."[16] Specifically, medicine uses rhetoric's methods "for reducing phenomena to their common forms, for placing these forms within emergent systems, and for practical invention devoted to agitation, comfort, or cure" (Pender 2005a, 40-41). In this sense, rhetoric and medicine are contingent and localized—intimately linked to passions perceived as both human and divine.

In the intertwined histories of rhetoric and medicine, reflection upon and intervention in practical, community-focused activity characterize both arts. But, crucial to understanding this relationship in the early modern period, as Nancy Struever suggests, is "community medicine and communitarian rhetoric['s] struggle for identity" in the intellectual climate of Cartesian dualism (1995, 288). This struggle highlights Cartesian attention to the mind-body split and rhetoric and medicine's habitation in the anthropomorphic. Struever notes that this struggle, present in sixteenth- and seventeenth-century intellectual debates, threatened to subvert the achievements of Renaissance rhetoric as well as the development of humanistic medicine.[17] Despite this threat, the realities of practicing medicine in the early modern period required a rejection of inherited scholastic medicine and the crucial substitute was attention to human occasion. As Daniel Gross points out, it is anachronistic to apply the term "human sciences" to disciplines before the mid nineteenth century; however, he asserts that the history of the

[16] See Pender 2005a; 2005b: "[A] 'rhetorised logic,' or that aspect of rhetoric in the Aristotelian tradition that involved interpreting signs, essaying probability, and establishing proofs … since both rhetors and physicians must intervene, they must embrace perhaps *certitudes practiques*" (2005a, 40). John Monfasani considers rhetoric during Renaissance humanism in relation to philological work in classical texts, which facilitated integration of classical rhetoric within contemporary education and practice (1988, 171). Educational integration of rhetoric influenced medical education as well.

[17] Struever notes "rhetorical analysis of texts was vital to the philological recuperation of Galen and other classical medical texts" (1995, 289).

proto-human sciences should be described as a history of practical art—rhetoric and medicine occupy this domain (2000, 7).[18] Tracing medicine from the early modern period to around 1800 requires one to do so with attention to its humanism. In other words, rhetoric and medicine deal with human uniqueness and the difficulties that result from this inherently uncertain position. "Gravely susceptible to error, medical reasoning relies on signs and examples, both gleaned from experience and both the subject of rhetorical inquiry; like rhetoric, medicine reaches plausible conclusions from probable premises" (Pender 2005a, 39). Physicians and rhetors reason similarly to make sound conjectures on what is plausible in the realm of human affairs.

Each discipline attempts to find the appropriate cure or method of persuasion for a specific occasion. However, each must confront the limitations of abstract theory or generalized knowledge to account for individual cases. In other words, theoretical knowledge and practical knowledge or know-how will not always align. As trained practitioner, the physician or rhetor is forever asked to strike a delicate balance between the two. The burden of medical education is to teach the student both the abstract and the practical.

Carlo Ginzburg, in his famous essay “Clues: Roots of an Evidential Paradigm,” (1986) identifies the deep historical roots of the conjectural paradigm. Unable to attain certainty, the conjectural paradigm operates on the premise that humans deal with a world of unstable knowledge—a world fraught with uncertainty—and developing precise

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[18] See Gross on the relationship between practical arts and the human sciences: “Rhetoric is an architectonic discipline that helped structure what would later be called the human sciences, establishing functional patterns for those disciplines explicitly designed to reflect upon and systematically intervene in social activity. … Noticeably missing in contemporary scholarship is a history of human sciences as a practical art” (2000, 7). See also Gadamer 1996.

solutions to these uncertainties is often unattainable in practice. In this sense, practical certainty, or probability, offers an alternative to verifiable, disembodied knowledge. Ginzburg asserts, "the group of disciplines which we have called evidential and conjectural (medicine included) are totally unrelated to the scientific criteria that can be claimed for the Galileian [sic] paradigm." In fact, he maintains that these are highly qualitative disciplines; the object of study being individual cases, situations, and documents (106). Ginzburg suggests that these specific cases are read through traces, symptoms, and clues—reading signs, both written and nonwritten, is characteristic of emerging historical disciplines. He sees it as particularly relevant in Hippocratic medicine "where the definition of its chosen method depended on the explicit notion of a symptom" (105). Not satisfied with reading medicine through the opposition between "rationalism" and "irrationalism," Ginzburg posits an alternative model of inquiry for medicine, one opposed to the Cartesian-Galilean paradigm, but with a strong kinship to rhetoric.

Ginzburg offers two reasons medicine is defined by a conjectural paradigm. First, cataloguing every individual disease into a scheme of classification was not enough because diseases manifest differently in individual bodies. Second, "knowledge of diseases remained indirect and conjectural: by definition, the living body was beyond reach" (114). Moreover, the inability to quantify diseases exhaustively was due to the constant presence of the individual. He argues, "the force behind this knowledge resided in this concreteness; but so did its limitation—the inability to make use of the powerful weapon of abstraction" (115). The task of moving from the general to the particular

restricts the physician from practicing only preexistent rules (124-5). Medicine is accountable to human affairs rather than abstract systems of thought. The tenacity of the conjectural paradigm is, in large measure, the legacy of practical arts.

An important contributor to the intellectual histories of rhetoric and medicine is Stephen Pender. His work attends to the practical nature of rhetoric and medicine, each art cultivating a healthy anxiety in their practitioners (Pender 2005b, 17). In "Between Medicine and Rhetoric," Pender argues that physicians use the rhetorical tools of "analogy, exemplarity, and prudence"—a "rhetoricised logic"—as a borrowed form of reasoning to think through contingency and probability (2005a, 39). For physicians, rhetoric provides methods for practical invention, which aid in negotiating the general and the particular to discover means of healing. These similar habits of thought, the emergence of a conjectural paradigm, "attest to the ways in which a 'phronetic' knowledge, which sustained both humanism and topical learning, continued to develop alongside a Cartesian-Galilean epistemology" (2005b, 23). Pender convincingly argues that rhetoric and medicine share forms of inference and reasoning. Both rhetoric and medicine have intellectual habits that, according to Pender, focus on an external aim of pragmatic engagement and intervention in human affairs. Furthermore, Pender asserts that rhetoric allows physicians to heal through probable sign-inference, analogy, and exemplarity (2005a, 63). Rhetoric not only shares intellectual habits with medicine; it models a pragmatic intervention leading to physical-material outcomes for the patient.

Finally, Nancy Struever, an intellectual historian of the early-modern period, published three seminal essays, "Petrarch's *Invective Contra Medicum*: An Early

Confrontation of Rhetoric and Medicine," "Rhetoric and Medicine in Descartes' *Passions de l'ame*: The Issue of Intervention," and "The Discourse of Cure: Rhetoric and Medicine in the Late Renaissance," which establish a distinguishable "rhetorical-medical mind set." Struever argues both the strength and vulnerability of rhetoric and medicine is their interventionist discourse:

> Both … are rather shaky empirical sciences. Both rest their claims to certainty on control of certain methods; but both are beset by the uncertainties of empirical observation: by inadequate methods of reading and reacting to multiple and diffuse, manifest or occult signs. Beset by uncertainty, both are obliged to be interventionist, and the interventionist discourse of both attracts opprobrium. (1995, 277).

Obligated to intervene in human affairs, rhetoric and medicine raise the issue of "investigative response to uncertainty" (Struever 1993b, 673). This position, Struever affirms, is a modest one insofar as the investigative response is not rooted in the domain of metaphysics, rather, human occasion fraught with uncertainty. There is no gesture to abstract schemes; the medical domain like that of rhetoric is characterized by untidiness, a logic of discovery, and a sensitivity to decorum. "The flexibility of poetic invention and of decorous rhetorical/medical response, generate useful habits of investigative action … these habits must take account of and function in the conceptual space of the merely probable, the radically uncertain" (1993b, 675-6). Rhetoric and medicine's confrontation with the contingent focuses inquiry in the interest of the individual, the specific—sharing the conviction that uncertainty is met with the necessity of practice (intervention). This directs attention toward habits of thought sensitive to political and bodily confrontation.

As social practices, rhetoric and medicine, at least as conceived in the early modern period, are both rooted in the community and its wisdom. One can conceive the

interventions of rhetoric and medicine in primarily social ways. Medicine, in particular, maintains habits of inquiry—up until the early nineteenth century—oriented to the individual case and therapeutics, in this respect placing an emphasis on human interaction. Both arts are practical, providing cures for physical or mental ailments. Pender explains, "if medicine and rhetoric treat the sick, then, both discursive and pharmacological remedies might heal an ill body or a distracted state" (2005b, 47). The persistence of rhetoric and medicine's affinity constitutes a relevant intellectual tradition, particularly, as medical modes of inquiry shift in the late eighteenth century toward adoption of early forms of experimental science, which begin to take root in the field of medicine. This shift alters the priorities of medical education, its curricular emphases, and even its teaching methods.

Theoretical Considerations

My focus on these primary texts will highlight the complexities of medical education reform in Britain, and the diverse perspectives that coalesced to shape medical education in new ways. To do this more effectively, I rely on three theoretical coordinates to ground my analysis: Nancy Struever's *Rhetoric, Modality and Modernity* (2009), Hans-Georg Gadamer's *The Enigma of Health: The Art of Healing in the Scientific Age* (1996, German publication 1993), and Nicholas Jardine's *The Scenes of Inquiry: on the Reality of Questions in the Sciences* (2000). By situating my analysis within these respective authors' theoretical commitments, my analysis of these primary texts is

illuminated by their careful thinking through key problematics of inquiry in rhetoric, humanism, science, and medicine.

In Stuever's *Rhetoric, Modality and Modernity*, she considers rhetoric as a kind of inquiry and argues "the importance of [rhetoric's] specific investigative interest … [that of] modality" (2009, 1). She further assumes that rhetoric as a hermeneutic offers a traditional contribution "to understanding civil interests, tasks, performances, carried in texts, signs, [and] deeply engages modality as [a] primary quality of civil experience … modal rhetorics deal in patterns of use" (1). What Struever offers my study is a notable account of rhetoric's intellectual history in relation to kinds of inquiry over time. Rhetoric, when taken seriously as a kind of intellectual inquiry with a long history, has been concerned with attention to the particular, the contingent. Thus, for an analysis of how rhetoric functions as a type of inquiry in opposition to scientific inquiry, Struever's work is the most fleshed out offering among rhetorical scholars of intellectual history. It is precisely her concern with the distinct difference between these types of inquiry that informs my study.

Gadamer's *Enigma of Health* is concerned with problems related to health care and the art of medicine insofar as modern science has complicated human intervention in these matters. Suggesting that there are limits to what can be measured in health and medicine, he has a strong hermeneutic interest in the shift from pre-modern notions of the *art of medicine*, to a medicine inflected with modern science. Gadamer argues that modern science functions as a "tribunal of verification" before which nature's functions can be confirmed or refuted. He explores the tension between science's desire to explain

disease in terms of physiology, pathology, and natural laws and the relationship between the doctor and the patient, which falls under the auspices of the art of medicine. In his treatment of medical education, Gadamer suggests that this sphere provides the institutional setting in which medical information can be "processed by selection, interpretation, [and] evaluation" in advance of the doctor-patient encounter; a notion that does not sit well with him. Gadamer believes that modern medical science and technology cannot "make" health. For Gadamer, medicine represents a "peculiar unity of theoretical knowledge and practical know-how." Gadamer proves useful to my study because of his treatment of the history of medicine as an art and the impact of modern science on medical practice. He argues, "everywhere it is a question of finding the right balance between our technical capacities and the need for responsible actions and choices" (1996, ix).

Finally, Nicholas Jardine's *The Scenes of Inquiry* offers my study an account of the history of the types of inquiry in the sciences that led to favored methods, and the justification for using certain methods at particular times and in particular places. In short, it is the "study of the formation, maintenance and displacement of scenes of inquiry" in the sciences (2000, x). His historicist approach grounds his study in the relevant questions of particular times and places in the history of science and avoids what he terms "traditional hermeneutic theories [which] tend to grant exclusive privilege to one particular type of significance of [historical scientific] works" (xiv). Rather, Jardine prefers a "question-based hermeneutics" when explaining the past actions and works of scientists.

> For it makes grasp of original meanings dependent on apprehension of past styles of inquiry, that is, of the ways in which past practitioners of the sciences resolved or sought to resolve questions. That is precisely what is required for the explanation of the formation of new scenes of inquiry and new doctrines in the sciences … which respects the past significances of actions whilst getting to grips with the Big Issues of discipline formation and the making of knowledge in the sciences. (xvi)

Jardine's historical account of how questions arise in the sciences, and his concern with how scientific theories and methods become favored over rival scientific theories, provides a conceptual framework through which to better understand the shift in the organizing mode of inquiry in medical education during the period I examine. To engage in how certain questions gave rise to particular medical theories, inquiries and methods is complex insofar as it is highly content and context specific. Jardine offers me a theoretical model upon which to pursue my analysis of the primary documents relevant to my study.

Nineteenth-Century Medical Education Reform in Britain

Historians of medicine by no means present a unified account of nineteenth-century medical education reform in Britain. Each identifies/emphasizes different aspects of the cultural/intellectual climate of medical reform in the early- to mid- nineteenth century. My modest contribution is not to tease out the disciplinary disputes over the nuances involved in writing histories of reform, rather, first to offer a broad overview of what reform looked like during this period in Britain. For my purposes, then, it will be sufficient here to identify the major acts that begin to transform medical education in Britain between 1800 and 1858 (the date of the Medical Reform Act).

In the late eighteenth century and early nineteenth century, approaches to medicine and medical education were not a unified; rather, remained diverse. The physician in 1800 was characterized by his placement within a professional and social hierarchy. The three orders of practitioners were physicians, surgeons, and apothecaries, each with specific training. Physicians were the élite (university-trained) and were qualified to practice the exclusive branch of "physic," which focused on internal medicine and treating the upper classes of British society. The physician learned his art at the university, Oxford or Cambridge, studying ancient medical doctrine and scholarly pharmacotherapy through reading Latin and Greek texts, listening to senior physicians and engaging in other aspects of traditional university education, such as disputation.[19] After examinations, the student would prepare himself for practice by walking the wards of London hospitals with only a limited dimension of "clinical" training. The process was entirely unorganized with the student determining his own curriculum; without exception, though, the university-educated physician was widely read in modern and ancient literature. Value was placed on the physician's capacity to reason, to apply his knowledge to a particular case, evaluate symptoms, and recommend a cure. Rational and reasoned, the physician considered symptoms and applied complex pharmacopoeia by skilled thought, considering the patient in terms of his or her life history and experiences. The practical art of medicine considered illness a deviation from the patient's natural state;

[19] "Classically trained physicians were perched at the top of the system. Steeped in logic and languages, they could decode the most complex symptoms and draw upon past experience or first principles to construct an appropriate regimen. Shunning manual work, their acutely trained and uncoarsened senses were able to recognize fine qualitative characteristics in a patient's bodily expressions—for example the tone of his or her pulse, or the subtle mix of elements that composed a unique, literally 'idiosyncratic' constitution. Surgeons remit, by contrast, was supposed to be restricted to the superficial and the specific … surgeons were regarded as doers rather than thinkers" (Burney 2003, 167-8).

the goal was to restore balance (Lawrence 1994; Newman 1957). The order of surgeon was that of a skilled practitioner; a university education was not necessary. Finally, the educational objective of an apothecary was practical. Primarily a shopkeeper, the apothecary's method of training was through apprenticeship to a mentor.[20] Toward the end of the eighteenth century, a new medical man emerged called a *surgeon-apothecary*, later called a *general practitioner*. Tension in the hierarchy with the new surgeon-apothecary/general practitioner—influenced by the climate of democratic reform threatening the dominance of the university-educated physician—held industry and trade in medicine to be progressive. These reformers believed improvement of status for the general practitioner was possible through the application of natural science and professional reform. These orders of medicine were intrinsic to the fabric of seventeenth- and eigheenth-century British society.

An outgrowth of this sentiment, and a key manifestation of the Scottish Enlightenment, the Edinburgh University medical school opened its doors to dissenting medical students and began lecturing in English rather than Latin. These medical educators placed a heightened emphasis on clinical instruction modeled on French medical education, in a hospital setting where many patients could be observed together (Lawrence 1994; Newman 1957). Medical historian Ian Burney points out:

> French medicine, in its ideal form, thus privileged a 'universalist' approach to the diseased body: at the cognitive level, it emphasized commonality over uniqueness, smoothing over the diagnostic and therapeutic consequences of individual (constitutional, historical, social) difference; at the level of practice, it merged the two main division [sic] of medicine by integrating symptomology with localization (respectively the

[20] For more on these orders of medicine, see Chapter Two.

> traditional domains of physic and surgery). In this it displaced a prior form of medicine. (2003, 167)

At the core of the French model of medicine, the physical body was understood as a transhistorical object (Burney 2003, 170). William Cullen, a teacher at Edinburgh's medical school, imparted knowledge of new classifications of disease that echoed the French model. What began to matter to these medical practitioners/educators was the commonality of disease rather than the individuality of the patient. Disease as a process distinct from the patient was being shaped. In essence, French local pathology and physical examination was imported into British medicine and leveraged by reformists to change the scope of medical education from humanistic to scientific.

During medical reform in Britain, there was a strong connection between adoption of "radical" French experimental science and radical politics.[21] Furthermore, many reformists wanted Britain to model its reform on a strong state infrastructure that supported laboratories and hospitals similar to France and Germany.[22] Bureaucracy was heavily entrenched in French medicine with many regulations, statutes, and certificates governing medical practice. France had also invested more heavily in medical institutions with "over twenty universities with medical facilities and colleges or guilds of medicine or surgery in many nonuniversity cities" (Bynum 1994, 6). Germany had strong paternalistic and authoritarian control over medical practice and public health; however, they did not have as strong of a university infrastructure as France (Bonner 1995, 26).

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[21] Burney also points out, "[i]n the hands of medical radicals, then, the ahistorical and abstract truths of reason and science promoted a vision of the physical body as a template not merely for reorganizing the structure of English medicine, but for reconceptualizing the social relations within which it was suspended" (2003, 171).

[22] See Ackerknecht, 1967; Bonner 1995; Bynum 1994; Maulitz 1981; Warner 1991.

The push for medical education reform in Britain culminated in a series of parliamentary acts: the Apothecaries' Act of 1815, the Anatomy Act of 1832, and the Medical Act of 1858. While my dissertation does not treat all of these acts in detail, my arguments do contextualize the social, educational, and political climate that served as a catalyst for their eventual passage. The bills and public debate leading to the passage of these acts narrate the rising forms of political, professional, and social interests, which I will treat more fully in my dissertation. The regulation of professional qualification of apothecaries stipulated in 1815 involved a more stringent and standardized education. This and the subsequent acts are part of a larger process of reform, which sought to identify and stipulate qualifications in various areas of medical practice. Charles Newman suggests "the reform of professional education was a general movement of self-regulation among the professions as a whole, not a reform of the medical profession in isolation" (1957, 112). Professional reform advanced ideas of rigid tests of admission, adherence to professional codes, and thorough education to ensure that these occupations were reserved for the most intelligent. The Medical Act of 1858 resulted in the establishment of a General Register to *equally* qualify physicians under the law; this idea was revolutionary, primarily because the notion of "orders" in medicine was a deeply rooted social construct. Despite this register, the patchwork of education and the variety of qualifications remained untouched. In large measure, the act of 1858 merely augmented the professional position of élite practitioners securing what they already possessed (Lawrence 1994, 55). The medical register, regulated by a General Medical Council,

established an orthodox medicine, a "safe" practitioner and became a significant part of the Victorian state.

During the reform period, science did not result in enhanced therapeutic efficacy (Shortt 1983, 68). Indeed, most physicians remained somewhat cautious and skeptical of the direct applicability of scientific innovation in practice. Shortt argues that during the reform movement, physicians used the authority of science to improve the image of physicians. "Under the guise of an objective explanation of natural phenomenon, science became a code-word for methodology, a designation for specialized expertise, and a vehicle for social mobility" (1983, 63-4). The professional goal was aimed at establishing a scientifically trained physician as the cornerstone of orthodox medicine, thereby, securing the physician as the professional "personification of omniscient science" (Shortt 1983, 68).

Although what constituted scientific knowledge was disputed in the reform era, basic education in physiology, anatomy, and chemistry became an essential part of an emerging view lay that science could help eradicate or manage disease. The utilitarian age in the nineteenth century reacted against humanistic medical education—despite the advantages of a classical education for a physician—and it was systematically abandoned in medical education. With the science of medicine progressing, humanistic subjects in medical education declined precipitously. Newman asserts, "by the middle of the century the utilitarians were defeating the humanists" (1957, 55). One of the more remarkable changes in medical education between 1800-1858 was the change in emphasis from symptoms to physical signs as a result of Laennec and auscultation. Meaning, medical

students began to be trained to listen to the patient's pulse (with this new instrument), examine the patient's body, and spend more time in the hospital wards. Evidence of this change in medical education from old symptomatic medicine of history taking and elaborate treatment to physical examination is evidenced in monographs which describe results and application of physical exams, textbooks which define medical practice as such, and case notes written by doctors (Newman 1957, 84).

Preview of Chapters

The body of this dissertation consists of three chapters, each of which treats a distinct set of discursive artifacts. The set in each chapter is bound together by common authorship (Chapter 3), publication venue (Chapter 4), or political forum (Chapter 5), and the ordering of chapters reflects a roughly chronological progression.

Chapter Two establishes the historical context for medical education reform in Britain from the mid-eighteenth century. In it, I survey the scholarship by historians of medicine to show the transformation of medical education and practice over time. This chapter sketches the role of British institutions (medical, social, governmental, economic) in medical education. I examine the changes in medical education, which reflect not only a shift to science, but also reflect a general transformation in educational ideas and political outlooks. Ultimately, medical education reform was enacted in 1858, but the systemic and cultural changes leading to this reform represent ambiguous alliances and tensions.

Chapter Three treats William Cullen, identifying him as a key figure for medical education reform, not as the sole innovator or reformer. Cullen's circumstances at the University of Edinburgh and the absorption of his social milieu make him representative. I explore Cullen's medical theory and work on the "practice of physic" as important to changes in medical education that anticipates nineteenth-century reforms to come. The four main treatises I focus on are *Nosology, or a Systematic Arrangement of Diseases* (1769), *Institutions of Medicine* (1772), *First Lines of the Practice of Physic* (1777), and *A Treatise of the Materia Medica* (1789),[23] which explicate his medical theory, medical pedagogy, and insights into the practice of medicine. Furthermore, these treatises brought together his texts and teaching both within and outside the University of Edinburgh. Much of the content in these treatises was derived from Cullen's years of lecturing at the medical school in the University of Edinburgh, and they were translated into multiple languages. This focus makes it possible to trace the connections between Cullen's work and broader changes in medical education in late eighteenth-century Scotland and Britain.

Chapter Four explores the key arguments and assumptions regarding medical education reform published between 1805 and 1830 in three mainstream medical periodicals: the *Edinburgh Medical and Surgical Journal*, the *London Medical and Physical Journal* and the *Medico-Chirurgical Transactions*. The debates in these medical periodicals were concerned with the place of medical humanism in the emerging scientific knowledge system of the nineteenth century. Contributions to these periodicals express deepening concerns for the status of medical education and argue for an

[23] There are other documents relevant to Cullen, such as his students' lecture notes taken at the University of Edinburgh, however, to get access to these documents necessitates travel to Scotland.

increased reliance on science in pedagogy. I argue that these discourses allow one to locate a coherent intellectual and lay community of thinkers invested in medical education and revision of medical pedagogy within the institutions of Britain.

Chapter Five considers medical education reform in the context of British Parliamentary debates in the 1830s and 40s. Here, I maintain that to understand the institutional shift in medical education from humanism to science requires focusing on three Parliamentary reports on medical education: (1) *Report made to his Majesty by a Royal Commission of Inquiry into the State of the Universities of Scotland* (1831), (2) *Report from the Select Committee on Medical Education with the Minutes of Evidence, and Appendix* (1834), and (3) *First, Second, and Third Reports from the Select Committee on Medical Registration and Medical Law Amendment; together with the Minutes of Evidence, and Appendix* (1848). These reports contain important primary material relevant to the research conducted by Parliament into medical education, which led to the eventual passage of the Medical Act of 1858. The practice of medicine was re-invented bureaucratically rather than remaining community-centered. The language in the Parliamentary reports is resonant of shifting epistemology in medical education, an epistemology that suppressed medical humanism. I show that Parliament directly engages with the disciplinary formation of medicine in Britain. I argue that it is significant that Parliament recognized universities as the locus of viable educational change. With interest in systemic and institutional reform, these discourses provide another dimension to the medical reform movement in Britain.

Chapter Six concludes my study with a brief evaluation of the Medical Reform Act of 1858. I argue that reformists used the discourse of experimental science to shape the practice of medical education in nineteenth-century Britain. I concentrate on the place of science in reformed medical education, especially as this is exemplified in the discourses analyzed in my study.

Chapter Two

Historical Context: Medical Education in Britain through the Eighteenth Century

The study of medicine in European universities changed dramatically over the course of the eighteenth century. In Britain this transformation culminated in the latter half of the century and set the stage for large-scale reforms in the nineteenth century. The changes in medical training during this period reflected broader economic, political, intellectual, and institutional developments. In Britain, higher education became more attentive to practical subjects and the needs of the growing middle class. Although Oxford and Cambridge remained for a time largely untouched by these demands, the Scottish universities were highly responsive. They opened their doors to a broader spectrum of students and, in response to low graduation rates in the arts,[24] streamlined their arts curriculum. They strengthened their professional education by offering courses in modern languages, law, botany, and chemistry.[25]

The medical schools established at Scottish universities in the early to mid-eighteenth century also introduced notable innovations in medical training. In this chapter I place these innovations in historical context, a context that will be crucial for understanding central features of the rhetoric of the British educational reformers. To establish some of the salient historical details will require a tracking of traditions and institutions back to the medieval origins of university medical instruction; others will

[24] Often, students would not graduate at the end of their arts course because they saw little use for the degree, and so instead chose to apprentice themselves or take private lectures; see Morgan 1933, 78.

[25] See Morgan 1933; Emerson 1992, 140-1; and Emerson 2003, 18-20.

emerge from comparing the situation of medical education, theory, and practice in Britain with that on the Continent. The chapter will conclude by identifying some of the special circumstances that prevailed in eighteenth-century Scotland, especially at the Edinburgh Medical School.

University Medical Education in Europe

Developments in eighteenth-century medical culture challenged traditions inherited from the medieval period. During this period, the monastic and cathedral schools initiated the formal study of medicine, and the Catholic Church controlled educational curricula and methods. Cleric-practitioners were nearly the sole preservers of classical medical learning, albeit in attenuated form. This study was in large part devoted to the preservation and copying of medical manuscripts. Surveys of the extant manuscripts suggest that students at these schools were taught the basic principles of classical medicine but lacked anatomical knowledge or the ability to discriminate effectively between disease and symptoms. Moreover, the period's medical treatises typically consisted of *exempla* followed by a series of questions and answers. "This method implied proceeding by way of the more obvious causes and effects to the discovery of the hidden causes of diseases, from which a method of cure could be worked out. In effect it required a definition, resolution and confirmation of the theory by experiment and experience" (Bullough 1966, 40). It is generally agreed that the pedagogical and other medical treatises produced in the period did little to increase medical knowledge.

University instruction in medicine was rooted in Latin, the universal language of higher learning. The medical knowledge that filtered into the medieval schools from the classical period was dominated by Latin translations of Hippocrates and Galen. Scholastic clergy members, many of whom both studied and practiced medicine, depended upon Latin for medical information. But many of the Greek medical writings were not translated into Latin, the medieval cleric learned only a small portion of classical medical knowledge (Bullough 1966, 30-2).

Latin remained the university-sanctioned language of advanced medical learning well into the eighteenth and early nineteenth centuries. In addition, university training in medicine was long and difficult, further ensuring that this knowledge would remain inaccessible to the average layman. For hundreds of years, the formal study of physic had been limited to those who met the social and class tests for a university education. There was a clear separation between the theoretical medicine studied at the university and the practical empirical medicine learned through apprenticeship and/or community practice. The university-educated physicians' education was separate from the practical training of surgeons and apothecaries. The development of the university in the medieval period produced a hardening of the system of the three medical orders—physician, surgeon, and apothecary—that remained deeply entrenched in Britain through the eighteenth and into the nineteenth century (see below). The different types or "orders" of practitioner were arranged hierarchically. The learned physicians stood at the top and were able to maintain their dominance over the profession in part because they had university-trained allies in the higher clergy and the law as well as urban-center allies in

the national monarchs. By contrast, surgeons, for example, were considered craftsmen and in need of no special or extensive formal education. As a result, university-based medical education neglected and in some cases totally ignored surgery;[26] this situation would prove difficult to correct later on.

By the twelfth century at the medical school at Salerno, however, a new model of medical education emerged that went beyond the monastic question and answer method of instruction. Salerno had enjoyed a reputation as a center of medical learning from the early medieval period, but this new model presaged what training would look like in the early modern period (Bullough 1966, 40). Salerno added to medical learning by expanding the availability of ancient texts and creating a new medical canon. Scholars at Salerno translated Constantine the African's medical writings, which channeled Arabic medical ideas as well as Arabic translations of a new set of Greek texts into the West.[27] Salerno also produced specialized treatises in anatomy and other fields. As the university began to develop more formally in the twelfth century, this newer model of medical

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[26] In Italian universities, surgery was still taught as part of the medical curriculum with physicians controlling its instruction. One effect of physician control was that as medicine professionalized, occupational groups fragmented, with physicians emerging as the professional group and most other groups (surgeons, apothecaries, midwives) being regarded as "paramedical practitioners" subject to the physician. These paramedical practitioners organized in various medical auxiliary groups—barbers guilds and apothecary guilds, for example—under the control of physicians. Most, if not all, of the paramedical groups were trained in the vernacular, not in Latin; see Bullough 1966, 82, 88-93.

[27] "Saletarian translations and teachings created a new canon of medical authority known as the *Articella* [Little Art of Medicine], which included the *Liber Ysagogarum* and Hippocrates' *Aphorisms* and *Prognostic*, supplemented by Galen's *Tegni* and the Hippocratic *On Regimen in Acute Diseases*. … [*Articella*] combined translations from Greek and Arabic; it was concerned with theory, providing a basis of philosophical knowledge organized around key themes; its discussions set medicine within a wider conception of nature; and its Aristotelian orientation appealed to university scholastics. … [T]he *Articella* texts were wholly Galenic: a proper doctor could thenceforth be defined as a man who knew his Galen. … For a couple of centuries, the translation movement had no less momentous consequences in Europe than in Islam, bolstering the prestige of antiquity and canonizing a Galenic medicine set in an arabized Aristotelian framework. Medical knowledge was buttressed not just by its classical heritage but by its place within the divine scheme of Christianity" (Porter 1997, 108-9).

education expanded beyond Salerno to other centers of medical learning—Bologna, Montpellier, and Paris.

Prior to the advanced study of medicine, entering students at these universities[28] began studies in the seven liberal arts established in the Middle Ages.[29]
The *arts course* was considered necessary preparation for the "higher faculties"—of which medical education was a part. In other words, after earning bachelor's, licentiate's, and master's degrees in the arts, the student could then continue to more specialized, advanced study in canon law, civil law, theology or medicine (Bullough 1966, 44, 48). The study of medicine was thus reserved for students who had a background in a well-defined arts curriculum. Although the arts curriculum expanded and was redefined throughout the Renaissance and the eighteenth century, the central pedagogical idea was that a university medical degree progressed naturally from study of/in the arts. A university arts degree would remain a prerequisite for advanced training in physic in the centuries to follow.

At the dawn of the Renaissance, then, medicine was ensconced in the university curriculum and with it, an ossified professional and social distinction between medical practitioners who could boast of a university degree and those who could not. Formal medical education in the Renaissance was dominated by study of the ancients.
In addition to bringing previously untranslated works of Galen other classical authors into the canon universities began to thoroughly systematize the whole of ancient medical

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[28] Of course, universities themselves were first founded in the twelfth and thirteenth centuries.

[29] The seven liberal arts were divided into two groups: the *trivium* (grammar, rhetoric, and dialectic) and the *quadrivium* (arithmetic, geometry, astronomy, and music). See Paetow 1910.

learning. Galen emerged as the central authority. Desiderius Erasmus himself produced Latin versions of three of Galen's works, *The Protrepticus*, *The Best Method of Teaching*, and *The Best Doctor is also a Philosopher*. These were the first to be based on the Greek editions (Porter 1997, 169). Other humanists endeavored to devise methods for applying Galenic theories in the treatment of contemporary cases of disease.

There were, however, some voices critical of Galenic ideas. For example, Vesalius was critical of Galen's dissection methods, concluding that he had only dissected animals and arguing that human dissection was crucial for a genuine understanding of anatomy. Vesalius' landmark book *De humani corporis fabrica* (1543) was the result of this interrogation of Galen's dissection methods and anatomical views. Subsequently, other Italian anatomists corrected some of Vesalius' errors and further advanced the understanding of the human body. One of the primary achievements of Renaissance anatomical inquiry was William Harvey's work on the circulation of the blood, which he built upon Vesalian anatomy.[30] As regards Vesalius' critical stance toward Galenic thought, Roy Porter has noted that, "For all their radical rhetoric, Vesalius's generation shored up ancient medicine and philosophy even as they exposed its factual errors." Nevertheless, Porter also emphasizes the genuine advancements and larger significance of the work of the Renaissance anatomists:

> Renaissance anatomists enormously elevated the standing of their subject. Its status had been low; it was not listed among the ancient major divisions of medicine, and was stigmatized by its surgical connexions; but the appointment of Vesalius at Padua served notice that anatomy and surgery were to be incorporated into the wider humanist medical movement. The *Fabrica*'s preface argued for the unity of the different medical arts;

[30] Galen's theory of blood flow had been unquestioned for almost fifteen hundred years prior to Harvey's discovery. Harvey published his famous work *de Motu Cordis* in 1628.

> physicians should not disdain to use their hands, an adage equally dear to contemporary experimental natural philosophers. Anatomy became integrated into learned medicine—even in backward England. … Anatomists presented their subject as the cutting edge; the way to certain knowledge was through the senses, especially by 'autopsia,' seeing for oneself. (1997, 185)

Although Renaissance advances in anatomy gave the study a heightened respectability and made it a subject fit for university study, Porter notes the irony that this development had little impact on surgical practice, a craft that would continue to be learned by apprenticeship.

Excepting the advances in anatomy, much of Renaissance medicine was philological at base. This characteristic of humanist medical education was inscribed in the statutory arts curriculum of British universities. As required by statute, a student's university career focused entirely upon the two medieval academic forms of lectures and disputations (Frank 1973, 200). These prescribed forms favored textual rather than hands-on study of science and medicine (despite the insertion of anatomy into the curriculum at some universities). The recovery of ancient medical texts fit neatly with these forms of instruction. Although these statutory *requirements* for the arts courses were very specific on procedure, the actual content of the curriculum could be modified to include different emphases in subject matter. As a result, the substance of a science curriculum could change substantially over time, as long as it followed the prescribed statutory forms. In other words, universities did not prohibit the substitution of new science for old, particularly in the eighteenth century as scientific subjects evolved.

The work of Newton was the chief catalyst sparking the development of British science. According to Roger Frank, the Oxford lectures of Gregory, Keill, Whiteside, and

Bradley demonstrate the "progressive infusion" of Newtonianism into the liberal arts curriculum (1973, 204). The statutory arts curriculum, particularly at Oxford and Cambridge, did not neglect scientific subjects, although they were considered to be a minor focus for students.[31] At university medical schools, professors made more obvious content changes by incorporating new subjects in the prescribed forms of teaching. By the beginning of the eighteenth century, physiological topics predominated. As the new subjects of chemistry, botany, and physiology were becoming part of university curricula, the demand, and supply, for resources on these subjects—through booksellers and/or libraries—grew markedly.

Opposing Loyalties: Vitalism versus Mechanism in Eighteenth-Century Medical Education

Harvey's explanation of blood circulation was a major breakthrough in the understanding of human physiology, and it is worth pausing to consider his discovery for a moment. His discovery brings into relief a core tension in the medical education of the period, namely, the uneasy fit between inherited medical theories (Hippocratic, Aristotelian, Galenic), reliance on Baconian observational-scientific methods, and the new Cartesian dualist philosophy. The Harvey-Descartes controversy over the efficient cause of circulation -- more broadly, "vitalism" versus "iatromechanism" (or

[31] Frank clarifies that science was typically not studied until the masters course because students had to first gain a solid foundation in grammar, rhetoric, logic and moral philosophy in their study toward the bachelor's degree. Sixty to eighty percent of students did not stay through the M.A. course, so had little idea of natural science/philosophy. "Only as a man approached the end of the arts course could he devote any significant portion of his time to the sciences, and by then he was expected to teach himself." After the 1650s this pattern changed, with tutors allowing undergraduate students to study sciences such as chemistry, botany, geometry, astronomy, and natural philosophy (1973, 201).

"mechanism") – demonstrates the tension well. In contrast to Descartes, "Harvey based the certainty of his knowledge primarily on direct observation and experiment, which he placed before reason" (Gorham 1994, 219). Descartes famously placed enormous value on a priori reasoning. But in some of his writings, Descartes did suggest that observation was crucial, and he did not always make observation serve theory (Gorham 1994, 221). Gorham further explains, "For Descartes . . . the issue is not which theory can save the phenomena but which sorts of theoretical explanations may legitimately be invoked in the first place" (1994, 225). Descartes' objection to Harvey's account was tied to his rejection of the legitimacy of the theory of vitalism. Descartes sought to explain physiology from a mechanistic viewpoint, while Harvey was amenable to a vitalistic explanation (see Pagel 1967). Harvey subscribed to an Aristotelian conception that the rational soul "informed and gave life to the body," and that the soul could not be separated from the body in thought (Gorham 1994, 232). Contrarily, Cartesian dualism held that body and bodily motion are independent from thought.

The adoption of iatromechanist and vitalistic theories had significant consequences for medical education and practice in Britain. Mechanists viewed the operations of the body as the cumulative workings of lifeless matter. The principle behind mechanism is a very precise interpretation of life as movement and the human being as a machine (Moravia 1978, 47); in this model, the body is conceived as a machine that produces motion through mechanical processes. In contrast, vitalists imbued the body with a "living force." But beyond this, theories of vitalism were varied. Some like Robert Whytt believed that the life-force came from a principle of irritability connected to the

soul. Other, more tempered vitalists like William Cullen regarded the life force as the nervous system only, disconnected from notions of the soul (Lawrence 1984, 58).

In the early eighteenth century, mechanistic views on physiology dominated medical education. [32] For the mechanists, life was encapsulated in movement. Reflecting Harvey's considerable influence, mechanistic physiologists held that the center of this movement was the circulatory system—the motions and textures of the blood were of primary importance (Schofield 1970, 49). The founder of this particular brand of British mechanistic physiology was Archibald Pitcairne, a professor at the University of Edinburgh in the late seventeenth century.[33] Not only did Newton's popularity offer an entry point for the mechanistic physiologists, it also helped install experimental natural philosophy as a dominant scientific model for medicine in the early eighteenth century (Brown 1974, 179).[34]

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[32] Bowman notes: "The rise of the mechanical philosophy in the seventeenth century drastically changed the nature of traditional science. Owing to the works of Descartes, Boyle and Newton, it became more common to account for all phenomena of nature in terms of material particles of varying size, shape and motion. Aristotle's four causes and four elements no longer formed the basis of scientific inquiry. Rather, explanations acceptable to mechanical philosophers were couched in terms of the arrangement and motion of material particles. By 1700 the mechanical philosophy was widely accepted in scientific circles" (1975, 19).

[33] Archibald Pitcairne (1653-1713) was appointed Professor of Medicine at Leiden in 1692. Later, he returned to Scotland and was the youngest fellow of the Royal College of Physicians in Edinburgh. He was a proponent of Newtonianism. "In 1688, Pitcairne issued his first publication, an essay entitled, *Solutio problematis de historicis; seu de inventoribus dissertatio*, which contains some hints of his new theory of medicine, sparked by his study of Newton. … Pitcairne claimed that [Harvey's] method, which he extolled as the true method of science, was not experimental but mathematical … and Pitcairne implied that a true demonstration must be mathematical in form, as indeed, he asserted, his own treatise was." (Guerrini 1987, 71-3).

[34] "During the ascendancy of dynamic corpusclarity few areas were more prolific in ingenious mechanistic speculation than physiology and chemistry. … [However], for both physiology and chemistry, the development during the second part of the eighteenth century is one of escape from mechanical reductionism, in which causation is sought in undifferentiated matter, motion, and forces, and the achievement of independent positions as autonomous disciplines. Physiology attained its goal by developing an empirical nosology" (Schofield 1970, 191-2).

In the early eighteenth century, Britain was insulated from much of the scientific work being done on the Continent. Contrarily, the influence of Newtonian physics was not as pervasive on the Continent as in Britain. The earliest Continental Newtonian scientists were the Dutch, owing to a close relationship between Britain and Holland (Schofield 1970, 135). One Dutch professor of medicine at the University of Leiden, Herman Boerhaave (1668-1738), exerted considerable influence on British mechanistic medical theory and medical education, particularly at the University of Edinburgh.[35] In the first part of the century, Leiden University was probably the most popular university for English and Scottish students to study medicine, but Boerhaave's pedagogical influence was even more widespread, thanks in part to his textbook *Institutiones Medicae* (*The Institutes of Medicine*) which was translated into five languages.

After Boerhaave's death in 1738, the University of Edinburgh replaced Leiden as a premier medical school, certainly in Britain. The first five medical professors at Edinburgh had studied under Boerhaave, and they imported the entire content of Boerhaave's medical course into their curriculum, adopting his *Institutes* as the central text (Cunningham 1990). According to Roy Porter, "Boerhaave promoted mechanistic disease explanation within a corpuscularian matter theory, seeing health in terms of hydrostatic equilibrium, a balance of internal fluid pressures … distinguish[ing] between disorders of the 'solids' and those of the 'blood and humours'" (Porter 1997, 246). Boerhaave's mechanistic philosophy was built on the foundations of Newton's physics, but conceived the human frame as a "Cartesian machine with a non-material soul"

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[35] Pitcairne had studied under Boerhaave in Leiden.

(Lawrence 1976, 82). Boerhaave believed that mechanics was sufficient to explain the corporeal human, but not adequate for explaining the mind-body interaction.

In contrast to the late seventeenth- and early eighteenth-centuries in which the general natural philosopher dominated physiological study,[36] by the mid eighteenth century the professional physician and the medical school had begun to take ownership of this branch of study. Furthermore, the dominant understanding of physiology was now Boerhaavian, signaling a slow turn from Newtonian physico-mathematical influences to experiment as a nascent investigatory and organizing method. Boerhaave's approach to physiology posited disease as its own entity, with its own signs to be identified with the proximate cause of the symptoms (Lawrence 1976, 84). Boerhaave's theory began to shift medicine's understanding of the locus of disease, separating it from the individual patient to a system of disease classes. Nonetheless, the prevailing medical views still conceived disease as occurring in individual iterations and to large extent dependent on the patient's life condition.

One can identify in Boerhaave the roots of a taxonomic and generalizing impulse that would be developed systematically over the course of the eighteenth century:

> Boerhaave conceived that … diseases, with their signs, were consistent phenomena in nature, that they were events occurring with such regularity and similarity that the physician could classify them. The species were in nature and were not a convenient division of experience. In the individual the disease may not manifest itself in pure form because of the perturbing

[36] The general natural philosopher dabbled in multiple scientific fields (chemistry, botany, physiology, mathematics). Natural philosophy was thus differentiated from "moral" philosophy (logic, metaphysics, epistemology, ethics, aesthetics). After Bacon, natural philosophy was considered a more "experimental" philosophy and incorporated—what at the time would be considered the scientific method. This shift was in opposition to Aristotelian theoretical deduction. In short, science began to use the collection of experimental data; however, "science" in this period remained a broad designator, like "philosophy."

> factors of age, sex, temperment, etc. … Boerhaave's taxonomic principle … was that of hidden pathological causes. (Lawrence 1976, 84).

Boerhaave's system was based on a rigorously classificatory approach to disease. It focused on consistent pathological states or conditions, which were intended to explain both the symptoms and potential cause(s) of a patient's illness (Lawrence 1976, 83, 89). His system differed from that of the later medical theorists at Edinburgh insofar as the primary motivation for Boerhaave's classification was not patient treatment or general therapeutics. His approach to medicine induced a shift in medical theory and its associated study to "innovation in pathological classification and conservatism in clinical groupings," while general medical therapeutics remained simplistic and tied to classical humoral doctrine (Lawrence 1976, 83).

The vitalist movement which commenced in the 1740s posited that experimentation exposed the limits of the mechanical model and proposed new theories of the relation between the body and soul. Robert Whytt's arrival on the faculty at the University of Edinburgh changed the purist Boerhaavian approach to medical instruction at the school, shifting attention from the vascular to the nervous system. Whytt developed a concept of the "sentient principle," which built upon Boerhaave's mechanistic physiology. In his publication *Essay on the Vital and Other Involuntary Motions* (1751), Whytt described this "non-material rational agent" as governed in involuntary activity through the nervous system (Lawrence 1976, 88). Whytt held that the nervous system was the central factor in integrating bodily activity. Life was determined by the body's sensitivity to external forces rather than an unaffected mechanical apparatus (Moravia

1978, 55). This new Scottish brand of vitalism attempted to resolve the paradox between the extremes of Cartesian dualism and Stahlian animism.[37] According to Karl Figlio, "vitalism is the rejection of two metaphysical interpretations [and] … merely the recognition of the originality of the vital fact" (1977, 267). Vitalist physiology gave the body a purposeful behavior that was non-material, and sought to explain the relationship between the emotions and involuntary activity.[38]

Although interpretations of vitalist physiology varied somewhat over the course of the eighteenth century (Duchesneau 1985, 260), by the 1770s it was clear that in medical theory and training vitalist principles had replaced mechanistic ones. Throughout the eighteenth century, physiologists transformed the application of science to the human body by moving deliberately away from Boerhaavian mechanistic principles. Eighteenth-century attempts to bridge the gap between the material living organism and its intelligence culminated in a medical vitalism that assumed the nervous system as mediating the external world and the mind. In other words, the nervous system contained within it the power to affect action, and the complexity of the nervous system signaled the degree of vitality. "[I]n physiology there was a change from a mechanistic style to one in which fluid spirits, ether, electricity, fire, and irritable or sensitive fibers were the principal explanatory entities" (Brown 1974, 184). The human being was no longer a

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[37] Georg Ernest Stahl's theory of animism posited that a living organism's functions depended upon directions from the soul. In other words, the function was not apparent simply by being visible. In contrast, Descartes posited that the function of an organism depended upon its mechanical structure (Figlio 1977, 267).

[38] Albrecht von Haller also rejected dualistic mechanism and animism and introduced the vital ideas of "irritability" and "sensibility" in his paper "On the Sensible and Irritable Parts of Animals" (1755). Théophile de Bordeu at Montpellier was also a vitalist, developing a life-force physiology.

machine but an organic being characterized by dynamic forces and impulses—possessing an internal vitality.

Observational vitalism led to medical treatises on nosology, which organized disease symptoms. The goal of these nosologies was to discover the vital principle responsible for health and disease recovery (Brown 1974, 211). Taxonomies in the tradition of Linnaeus' botanical findings were a common way to organize natural philosophy in the eighteenth century—medicine enthusiastically adopted the method. This approach to organizing medical knowledge was the source of what would later be recognized as the eighteenth century's emphasis on generalized "systems" of medicine. Though this emphasis has often been criticized, the following chapter (Chapter Three) will reconsider the issue and identify some of the productive, heuristic aspects of this approach in the medical pedagogy of Edinburgh's celebrated teacher, William Cullen.

(Dis)Orders in Medicine: A Catalyst for Reform

As is apparent from the discussion so far, the eighteenth century was period of considerable international exchange of medical ideas, pedagogical approaches, and students. In some important respects, though, Britain remained apart. Notably, in the early decades of the nineteenth century, Britain was distinguished by the degree of statement involvement in and regulation of medical education. France had early on established national standards of medical training, and French cultural and educational ideals spread across Europe during the Napoleonic wars. Many German reformers, resistant to French influence, reorganized their universities to give added attention to

science and professional education, while maintaining a humanistic core of study in the liberal arts (Bonner 1995, 13; Broman 1989, 42-43). In France the state assumed overwhelming authority after the Revolution, and in Germany there was only slightly less powerful state influence.[39] By comparison, government regulation of medical education in Britain, where it did exist, was much looser and enforcement more relaxed. However, mounting tensions between the different classes of medical practitioners – a disorder among the traditional "orders" – eventually came to crisis level and served as a crucial catalyst for state intervention.

As noted earlier, throughout the eighteenth century and into the nineteenth, the medical practitioner in Britain was characterized by his placement within a professional and social hierarchy. Healers who practiced individually oriented face-to-face medicine were placed in three distinct orders—physicians, surgeons and apothecaries. The three orders of medicine, whose roots stretched back to the Middle Ages, reflected a social division of practitioners into status groups. The order of physicians comprised a tiny medical elite that exercised disproportionate influence on the regulation and practice of medicine in Britain (Underhill 1987, 75). During the seventeenth century, Henry VIII chartered the lay institution, the Royal College of Physicians, and endowed it with the power to determine, through licensing, who could legally practice medicine in Britain. The Royal College of Physicians was an economically and educationally privileged social group that worked vigorously to maintain monopolistic control over the profession, at least in and around London. Its required its members to practice a certain type of book-learned, erudite medicine. The College's licensing exams were conducted in Latin until

[39] See Gelfand 1980; Tuchman 1985; Tuchman 1993.

1830, effectively limiting the right to practice to the university-educated, and it was not until the late eighteenth or early nineteenth century that fellows were admitted to the College without a degree from Oxford or Cambridge. Though exclusive and powerful in the capital city, it is generally conceded that the College did little to advance medical knowledge or improve methods of therapeutic intervention.[40]

Licentiates of the College were technically able to practice medicine only within a seven-mile radius of London. This limitation, however, did not stop the proliferation of non-licensed medical practice outside this geographic area. The Royal College of Physicians held legal control over medical licenses; however, it did little to enforce unauthorized practice. Paul Underhill observes that a few key circumstances thwarted RCP from taking legal action:

> Outside [London] the [Royal College of Physicians] proved unable to exert any genuine control over professional practices virtually throughout the eighteenth century, and failed to translate its disgruntlement at the growing number of practitioners with 'bishop's licences' into effective legal sanctions. Observance of the letter of the law would have meant a few hundred physicians in 1800 attending the 'internal' medical needs of over eight and a half million people in England alone. (Underhill 1987, 92)

Although there was discontent with unregulated medical practitioners, RCP-licensed physicians could not by themselves attend to the medical care and well-being of the British population.

Throughout the eighteenth century, and especially from the 1770s onward, new opportunities for formal medical education and means of professionalization began to

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[40] "[B]y 1750 the finest physicians were Dissenters by religion and trained either at Leiden or Edinburgh. Eminences like William Hunter, John Fothergill and John Coakley Lettsom resented being relegated to the status of mere non-voting 'licentiates,' or second-class citizens [of the Royal College of Physicians]. … [and] the college did little to promote medicine" (Porter 1997, 288).

threaten the Royal College's monopoly over medical practice. Physicians could be trained at the University of Leiden or other Continental universities, or in Edinburgh, Glasgow, or Dublin, and could supplement this education by attending public anatomical lectures and walking the hospital wards. By the beginning of the nineteenth century, the College risked becoming obsolete, and licentiates attempted legal sanctions against their restrictive by-laws. In particular, Scottish licentiates and graduates from the University of Edinburgh struggled to reform the College to make it less restrictive.[41] For example, whereas the Scottish universities allowed medical students to acquaint themselves with surgery and midwifery in addition to traditional medicine, these subjects were excluded from the College's licensing exam.

In the traditional "ordering" of the profession, physicians viewed surgeons and apothecaries as their manual attendants. For every four or five surgeons and apothecaries, there was one university-educated physician. This disparity was a product of the patronage system in which physicians consulted elite clients, charging a high fee for their services. If one were unable to afford a physician, he or she typically went to an apothecary. The book-learned, "gentleman physician" aimed at demonstrating erudition and skillful reasoning. The medical education at Oxford and Cambridge that produced this type of physician was based in the study of canonical texts. Both Oxford and Cambridge required an arts degree followed by advanced study focused on the works of Hippocrates, Galen, and Avicenna. Neither university had a hospital or clinical lectures

[41] Much of the reformist rhetoric in the early nineteenth century medical journals – especially that of Thomas Wakley's *The Lancet* established in 1823 – was also directed against the restrictiveness and exclusivity of the Royal College. See Desmond 1989; Loudon and Loudon 1992; Pladek 2011. I treat several aspects of the rhetoric of the medical periodicals in Chapter Four below.

(Poynter 1970, 236). "In their ideal ordering of medicine, physicians built a structure that valued mind over matter, head over hand, art over artisan, gentility over labour" (Lawrence 1994, 10). A physician's treatment consisted of writing complicated prescriptions for drugs based on ancient and scholarly pharmacotherapy.[42] Elite patients demanded little more from their doctors (Newman 1957, 8-9). However, as new approaches to natural science began to bear fruit in the early nineteenth century, the traditional education of the physician and his favored methods of treatment were increasingly recognized as inadequate.

The surgeon was a practitioner trained through apprenticeship; as such, a university education was not necessary. Because surgery was tightly associated with manual labor, elevating the professional status of the practice was difficult. The surgeon's practical interventions included the suppurating of wounds, opening of abscesses, setting of fractures, and employment of various other operative techniques (Underhill 1987, 98). The surgeon's function was to provide *external* treatment, leaving all internal medicine, such as diagnosis and medicine administration, to the physician and apothecary. Essentially (as noted earlier), surgery maintained a craft status rather than status as a *scientia*. It was not until the sixteenth century that surgeons formally affiliated with barbers in an attachment between the trades – the Barber-Surgeon's Company—that

[42] Christopher Lawrence describes the professional culture of the educated physician and his typical method of practice: "Physicians considered themselves the healers of the well-to-do, and thus they cultivated the learning and manners of the orders they aspired to attend. In the physician's ideal self-portrait he was university educated and widely read in the most modern and ancient literature. In practice the physician's task was to draw on this modern and classical knowledge and reason out what was occurring beneath the sufferer's skin. His learning told him, in general, what were the possible origins of the sick person's symptoms in the darkness of the body. His capacity to reason, to apply his knowledge, allowed him to proceed in a particular case from the obvious sensory data to hidden causes. Apart from feeling the pulse the physician rarely touched the patient during consultation … the structure of medical reasoning rendered it unnecessary" (1994, 10).

lasted for at least two centuries.[43] By the eighteenth century, surgeons began to dissolve this association, aligning themselves more closely with physicians, in order to gain a more respected professional and social status. In 1745, the Company of Surgeons (renamed the Royal College of Surgeons in 1800) formed in order to compete with the elite physicians and to present more unified opposition to medical quackery.

The Company of Surgeons had a looser structure than the Royal College of Physicians and did not attempt to create a monopoly over the practice of surgery; it allowed some local control of apprenticeships and entry to the profession. Voluntary hospitals for the sick poor (provincial infirmaries), which spread rapidly in eighteenth-century Britain, also emerged as important sites for surgical training and skill improvement (Risse 1986, 64-5; on the voluntary hospitals, see further below). As the eighteenth century progressed, formal education for surgery became more important, largely due to the influence of Scottish universities and the revival of anatomy as a subject of advanced study (Underhill 1987, 104; and see above). As physicians increasingly accepted the importance of anatomy in medicine, surgeons acquired a more significant role in diagnosis and treatment (Temkin 1951). Indeed, surgeons with special expertise in anatomy acquired a professional status comparable to physicians.

By the end of the eighteenth century, elite surgeons had become part of a somewhat cohesive professional unit charged with, among other things, contributing to the education of future surgeons. Moreover, surgeons became important to physicians in

[43] "As with other medieval guilds, the Barber-Surgeons' Company was formed for the protection of common interests against the incursions of other groups which infringed upon its legitimate sphere of activity. The guild system operated on the assumption that the 'public interest' was best served by ensuring high quality production from proven masters of the relevant art or craft. Most guilds conferred exclusive rights to engage in particular types of production" (Underhill 1987, 100).

their own medical practice, a fact that would seem to have contributed to an erosion of the barriers between the entrenched orders of medicine.

Apothecaries attended grammar school until the age of about thirteen and then embarked on a seven-year apprenticeship. Most acquired a limited understanding of Latin in order to read physicians' prescriptions, but were considered—by many physicians, at least—lowly shopkeepers or tradesmen. Indeed, it took some time before they were clearly differentiated from grocers or retailers through a Royal Charter that legally formalized their guild status, thus preventing infringement from unqualified competitors. Underhill observes:

> By 1617 the apothecaries were incorporated as a distinct tradeguild; and three years later secured a Royal Charter issued by James I to 'the Master, the Warden and Society of the Art and Mystery of the Apothecaries of the City of London.' No grocer could henceforth keep an apothecaries' shop under penalty. The Company insisted on a full seven year apprenticeship and no apprentice was to be granted freedom to open shop without having passed an appropriate examination. As the power of guilds to enforce apprenticeship regulations diminished, literally anyone in England by the eighteenth century was able to call himself an apothecary, practise as such, and prescribe medicaments. (Underhill 1987, 117-18).

Initially, physicians supported the development of a distinct apothecaries tradeguild insofar as it would allow the Royal College of Physicians to require strict compliance from apothecaries and thus maintain a legal monopoly over the dispensation of medical diagnoses and advice. However, as the numbers of apothecaries grew to try to satisfy the population's demand for medical treatment and advice, their subordinate position to physicians began to be undermined. In the late seventeenth century, as a backlash against apothecaries' increasing resentment of physicians' monopoly on medical practice, the Royal College of Physicians began to prosecute apothecaries who were illegally

practicing “physic.” A partial compromise was reached when, in 1704, the House of Lords decided that apothecaries could visit and prescribe to patients, but they could only charge for the drugs they supplied and not for their advice (Underhill 1987, 119-20).

The Society of Apothecaries’ primary purpose was social and political not educational. By the mid-eighteenth century the society assumed a craft-guild identity rather than a trade-guild identity (Berlant 1975, 133). Many apothecaries began treating patients in their homes to augment the income they received from the sale of drugs in their shops. Slowly, apothecaries, too, began to challenge the established boundaries between the orders, taking work away from university-trained physicians. Concomitantly, chemists and druggists began encroaching upon the apothecaries’ domain, threatening their livelihood and status. The tensions between apothecaries and chemists/druggists were rooted in boundary disputes over material gain—primarily due to the demonstration of apothecaries’ ability to make a living solely from surcharges on drugs. Often, apothecaries would serve middle-class patients, while chemists and druggists would serve the growing industrial proletariat. “The supply of educated apothecaries, whose training lasted from five to seven years, was too inelastic to meet this need in the short run. The chemist was bridging a gap in medical care created by the increased needs of a changing society. This, to some extent, accounts for the apothecary's antagonism towards the chemist” (Holloway 1966, 112).

To settle this boundary dispute, apothecaries sought further regulation, an effort that culminated in the Apothecaries Act of 1815. The act was directed principally against the chemists and druggists. The apothecaries’ grievances included what they viewed as

chemists' and druggists' inadequate education, and the lack of regulation of these practices. They looked to the government to raise the standards for entry and to prohibit unqualified people from practicing (Holloway 1966, 111). The 1815 Act altered the auspices granted in the sixteenth-century Royal Charter by giving designated authorities the right to enter apothecaries' shops and examine their drugs in order to purge the shops of any unlawful or harmful medicine and abolished local guilds' regulation of apothecaries, bringing it under the auspices of the Company of Apothecaries based in London (Holloway 1966, 124).

One should not underestimate the significance of the 1815 Act to the evolution of medical education reform in Britain. In the words of Susan Lawrence, the Act constituted "a signpost within the history of medical education and the medical profession in Britain": "As the first parliamentary enactment to require licensing by examination for a large number of medical men—all those who intended to give medical advice and to dispense medicines throughout England and Wales"—it marked a "watershed between the heyday of unregulated … practitioners and the rise of increasing state supervision over entry into the medical profession" (Lawrence 1991, 45).

The Royal College of Physicians initially fought against the bill in an effort to maintain their control over medical practice and to prevent the newly emerging "surgeon-apothecary" from gaining any leverage (see below). The College reversed its position late in the process—only when it seemed destined to pass in Parliament despite the College's objections—and worked to ensure specific language that maintained a subordinate role for surgeon-apothecaries. This revised bill became the Apothecaries Act in 1815, and it

pleased the College insofar as it placed the Society of Apothecaries under its tutelage (Holloway 1966, 126). Ultimately, the revised bill was a disappointment to the surgeons and apothecaries who had struggled to improve their professional status:

> The original proposals of the Associated Apothecaries and Surgeon-apothecaries included provision for the regulation of the practice of surgery and midwifery; for the establishment of a medical school; and for the right of the general practitioner to charge for attendance. The Apothecaries' Act of 1815 satisfied none of these demands. An examination of the reactions of the reformers reveals clearly the bitter disappointment they felt at the result of their efforts. The Associated Apothecaries and Surgeon-apothecaries referred to 'this most arduous and most unsatisfactory struggle.' (Holloway 1966, 126-7)

The College of Physicians manipulated the bill to the point that the Apothecaries Company gained little ground. This manipulation reasserted the formal division of the traditional orders—physician, surgeon, and apothecary. Ultimately, the Act, far from challenging the system of orders and the established hierarchical professional structure, actually reaffirmed them: "[B]y diverting the agitation of the general practitioners into conservative channels, the College had ensured that this world [of their traditionally privileged status] would disappear more slowly than it might otherwise have done. The Apothecaries' Act was a reassertion of the theory of 'orders' at the very moment that this theory was crumbling in the face of the new social structure … [I]t was a strange victory for an association of general practitioners many of whose members were also members of the College of Surgeons" (Holloway 1966, 129).[44] Although the 1815 Act did not satisfy

[44] "The efforts and objectives of the radicals—which included the foundation of a medical school, complete prohibition of medical practice by the uneducated, and an attempt to challenge the legal separation of the medical estates as a means of raising the status of general practitioners—were effectively thwarted by the passage of the Act. Indeed, those who had campaigned for fundamental reforms on behalf of that 'hybrid class' of practitioner [surgeon-apothecary] were bitterly disappointed at the turn of events in 1815. If their

the demands of the apothecaries, it did solidify and gain national recognition for their professional identity. The Apothecaries' Act, like the changes witnessed in the other orders traced earlier, was the expression of a broader spirit of medical reform that had been fomenting from the end of the eighteenth century, but had now brought the questions and complaints directly before the eyes of a parliament willing to act.

The Rise of the General Practitioner and Medical Education Reform

It needs to be emphasized that the traditional orders did not represent the full diversity of medical practice in this period. Religious healing and magic remained commonly exercised options for the poor and rich alike,[45] and commercial motives encouraged many others to careers in various healing arts: "In addition to the medical estates [orders], there were also innumerable quacks, empirics and amateur practitioners who were an important source of therapy for all classes of the population" (Jewson 1974, 374-5). There was, in fact, acute concern for "overcrowding" in the medical profession in the eighteenth and early decades of the nineteenth century. Licensed physicians faced stiff competition from "unqualified" practitioners, a fact that constituted another important catalyst for reform. As Ivan Waddington has observed, the problem "gave rise to widespread demands within the profession for the establishment of a system of registration and the stipulation of minimum training requirements. The culmination of

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principal goal was to stem the tide of quackery and unqualified practice, then the Apothecaries Act utterly failed to advance it" (Underhill 1987, 137).

[45] See Porter 1995 and Vickers 1984.

what proved to be the Medical Act of 1858" (Waddington 1990, 688; on the Medical Act, see Chapter Six below).

The problem's acceleration was regularly associated with the arrival of a new player in the field, the surgeon-apothecary, later to be termed the "general practitioner." Indeed, as the nineteenth century began, the general practitioner represented not only economic competition, but a profound challenge to the traditional professional structure and hierarchy: "the general practitioner required an education and examination in medicine, surgery, midwifery, and pharmacy, but no medical corporation required, or would examine on, an integrated course embracing all these subjects" (Waddington 1977, 180). Because general practitioners constituted a hybrid of the established professional divisions, they did not have any means of collective legal recourse or corporations through which to advance their professional cause. As a result, the leadership of the existing professional organizations was slow to acknowledge this newcomer to the scene. However, the Royal College of Physicians would eventually come to view the general practitioner as a grave threat to the status it had traditionally enjoyed. Not surprisingly, the general practitioner was a constant point of reference in the rhetoric of reform which increased in volume over the early and middle decades of the nineteenth century.

In that period, surgeon-apothecaries were competing with (and in many areas, outcompeting) both physicians and surgeons in the medical care market (Loudon 1986, 192). General practitioners in fact provided a remarkably large portion of medical care for the British laiety. A typical provincial town in Britain (with a population of 20,000)

would have been composed of roughly twenty-five medical practitioners: two or three physicians, two or three surgeons, and the rest general practitioners (Loudon 1986, 223).

I have already observed that debates over the ranks, qualifications, and criteria for differentiating among medical practitioners are central to the story of nineteenth-century British medical education reform. The general practitioner's range of competencies and their hybrid professional status adds significant complications; yet that, as well as their generally lower fees, was also a source of their success in the medical marketplace:

> Conventional wisdom suggests that the physicians would have held a university MD, usually from Oxford or Cambridge, as well as the licence or extra-licence of the Royal College of Physicians of London. … The surgeons would have held the diploma of membership or, after 1843, the fellowship of the College of Surgeons. They would have confined themselves to surgery, mostly in a consultant capacity. The general practitioners would have been clearly distinguished on three grounds. First, by the nature of their practice which included all four branches of medicine, physic, surgery, pharmacy, and midwifery; secondly, by their dual qualification of 'College and Hall,'[46] … and thirdly, by the level of their income which would, on average, have been substantially lower than those of the physicians and surgeons. (Loudon 1986, 223-4)

The degree of overlap between these three groups – physicans, surgeons, and surgeon-apothecaries -- was more pronounced in the provinces than in London. There, the public tended to be less concerned about the differences in education between these three groups and to base medical care decisions on cost and convenience.

Despite their growing public prominence, general practitioners maintained a low status in the eyes of "gentleman" physicians. As late as 1845, a critic argued in the

[46] "The introduction of the LSA (Licence [sic] of the Society of Apothecaries) in 1815 and the MRCS (the diploma of Membership of the Royal College of Surgeons)—the dual qualification known colloquially as "College and Hall'—provided the general practitioner with a broad education and formal certification. It is quoted not only as evidence of the rise of the lower ranks of the profession, but also of the protection of the public from unqualified medical practitioners" (Loudon 1992, 219-20).

Edinburgh Medical and Surgical Journal that general practitioners are "a body of men 99 out of 100 of which are most imperfectly educated, all engaged in the trading, money-making parts of the profession and not one of them distinguished by anything like science or liberality of mind" (1845, 255-6). On the other hand, some valued general practitioners for the quality and breadth of their medical training. Accordingly, in the context of the medical education reform movement, a crucial distinction emerged between "regular" (university-educated) and "irregular" (non-university educated) practitioners.

As should be apparent already, though, education figured centrally in attempts to discipline the profession. The specific concerns and objectives fueling reform of medical education included: (1) the need for a more standardized system of medical education across Britain; (2) within that system, a strengthening of education in the natural sciences; (3) the need to curtail power struggles between the traditional professional orders (physician, surgeon, and apothecary); (4) the need to root out of "quackery" in medical practice; and (5) the desire to codigy of the distinction between "regular" and "irregular" medical practitioners (especially as regards the new "general practitioner"), with university credentialing as a key litmus test.

Another factor that played a crucial part in the push for medical education reform was the rise of the voluntary hospital, which offered new opportunities for clinical medical instruction and for medical research, and also suggested a new institutional model for the university-based medical school.

The Rise of the Hospital and Clinical Instruction at Edinburgh's Medical School

> *William Hunter made a nicely prescient guess about the direction of progress in medicine. Read with the benefit of hindsight … Hunter pointed to empirical methodology for 'improvements in physic' that detached the investigation of disease from patients' experiences of illness and from direct concern for treating it. A newly conceptualized medicine started at death, when the bedside-practitioner gave up and the scientist-practitioner took over—and these were the same person.*
> (Susan C. Lawrence 1996, 1)

William Hunter (1718-1783) was a famous Scottish surgeon turned physician, medical lecturer, "man-midwife," and anatomical investigator during the eighteenth century. By the 1780s, Hunter was a well-known physician and anatomist. His focus on the importance of dissection of the dead for improvement of physic and understanding of disease required a large-scale institution such as a hospital. Contemporaries of Hunter viewed the voluntary hospital movement as the "most noteworthy philanthropic achievement of the [eighteenth] century" (Risse 1986, 11).[47] A leading historian of British medicine, Susan Lawrence has authored a number of meticulously researched publications on the London hospitals of the mid- to late- eighteenth and early nineteenth centuries.[48] Lawrence's work makes clear the reasons for the hospital's emergence as a crucial institution for medical teaching and learning. According to Lawrence, the rise of the charitable hospital was significant as a space in which to explore and deploy new methods in both medical theory and practice, methods that combined the traditionally

[47] Guenter Risse elaborates: "Bequests came in mainly from the wealthy merchant class, which insisted on efficient institutional management and integration with the city's official establishment. In the late sixteenth and the seventeenth centuries private contributions became an acceptable practice and indeed an honored charitable tradition. Sick, old, and infirm people from the lower classes of society living in London composed the population of these institutions" (1986, 11-2). See also Gale 1967.

[48] Lawrence's studies have involved research on multiple London hospitals and the use of sources such as their governors' minute books, student notes, and pupil registers.

separated orders of surgery and physic. Lawrence argues that "studying London's hospitals, practitioners, and pupils in the years between 1700 and 1820 reveals the relationships among institutions, medical training, and medical publications that created medical practitioners with different degrees of occupational and social power based more and more upon access to certain kinds of hospital knowledge" (1996, 3). She points out that as people moved between the hospitals, "'hospital medicine' gained a level of conceptual abstraction within the urban medical community" (1996, 3).

A major weakness of most university medical education up through the eighteenth century was its stress on theoretical classroom teaching rather than practical clinical instruction. Students eagerly sought out "more classroom demonstrations, more opportunities for dissection, more teaching in the clinic or hospital, and especially more hands-on experience at the bedside" (Bonner 1995, 84). Although the hospital presented vital opportunities for clinical instruction, the city of London did not have an established medical school, so hospital education there was an *ad hoc* venture. Being at some distance from urban centers, Oxford and Cambridge did not offer any clinical lectures. By contrast, Edinburgh's Royal Infirmary, founded in 1729, was from 1756 the site of regular clinical teaching for the Edinburgh medical school.

The hospital movement in London was philanthropic, and also a response to the Enlightenment call to improve public health by increased faith in the role of medicine. "Following Enlightenment ideals, the assumption underlying most medical activities, including hospital treatment, was that human happiness and productivity could be promoted if health were protected or restored. … Henceforth professionals were to be

widely employed to deal with sickness as experts" (Risse 1986, 16). In the early eighteenth century, Britain possessed only five hospitals, all of which were located in London. As the century progressed, the movement to provide better hospital infrastructure increased. This movement coincided with other reform efforts such as the establishment of charity schools, orphanages, workhouses, and prisons. Contributions made by donors carried with them social responsibilities:

> Patrons pledged specific sums of money or stock, their payments made quarterly, annually, or even in the form of life memberships. In exchange, each donor acquired the right to recommend a specific number of patients for admission to the hospital. Most subscriptions entitled contributors to sponsor one to three patients annually as long as the charitable payments were made on time. Those who were delinquent and did not follow up their pledges received first friendly reminders and then warnings, including threats that their names would be published in the newspapers as persons who had reneged on their philanthropic responsibilities. (Risse 1986, 19)

Most medical professionals in Britain played a secondary role in the early voluntary hospital movement, but they quickly realized the advantages for medical knowledge by leveraging these institutions for teaching. In the hospital, practitioners exerted more control over their patients through more consistent follow up to individual cases. However, the charitable hospitals also had a dark side consisting of overcrowding in the hospital wards, poor hygiene, and rapid spread of infectious diseases (Risse 1986, 22).

The work of the London hospitals must be understood in relation to the three major medical corporations. The Worshipful Society of Apothecaries, the Barber-Surgeon's Corporation (until 1745) or Company of Surgeons (1745-1800), and the Royal College of Physicians were all based in London. The first two (as noted earlier) were akin

to craft guilds and members were registered at the apprenticeship stage of their careers. The College of Physicians, founded in the sixteenth century was and remained a "college" in the Renaissance sense—a group of elite physicians, but not organized as a system devoted to the education of future generations. Rather, the College was a formal institution of learning and debate (Lawrence 1996, 11).

Prior to the founding of the University of London's medical school in 1826, these corporations constituted the only professional medical structure, or rather scaffolding, around the London hospitals.

> London's informal, ad hoc system of private lectures and hospital ward-walking, however, at once supplemented and subtly undermined university study and apprenticeship as sufficient ways to gain medical expertise. Accessible medical lectures, medical societies, and a prolific medical press generated a newly articulate rank and file. And, as both prominent and lowly practitioners participated in defining 'good' knowledge and practice, they further constructed claims to medical authority based upon their specialized training in and around London's hospitals. (Lawrence 1996, 12)

The robust community of aspiring practitioners supporting this ad hoc system in London challenged the traditional paths of medical education. Hospital teaching, in the form of clinical lectures, was an important part of a medical students' training. This development in London reflected a Continental influence. By the late eighteenth century, hospitals had become the primary place for formal clinical instruction in Paris; indeed, the hospitals became Paris' central medical institutions.[49] The clinical opportunities were the chief

[49] This development is by now well known in outline, though assessments vary. Susan Lawrence explains "[t]wo of the core texts firmly establishing that modern medicine started in Paris came from scholars with radically different agendas in the 1960s. Michel Foucault's [*The Birth of the Clinic*] marks one philosopher's early forays into understanding medicine as a system of power constituted by, and deployed within, certain kinds of knowledge about the body. His analysis displayed deep contemporary concern over

cause for Paris' rise to preeminence in medical education in the first half of the nineteenth century, and a huge attraction for medical students throughout Europe and beyond.

In London, science was on the radar of the hospital wards, which quickly became a place where a practitioner could pursue emerging "scientific" (clinical) medicine. The hospital men were interested in advancing medical knowledge by using experimental science as a guide.[50] Because the primary mission of London hospitals was charitable, hospital medicine's relationships between people, institutions, and knowledge placed its pursuit of contemporary science within a somewhat fraught educational endeavor—meaning: "hospital relationships were always as concerned with morality as they were with efficient or effective medical practice; with practitioners' social status as much as their science; and with patients' roles as objects of charity as much as their role as possible objects for clinical observation" (Lawrence 1996, 20). These hospitals served poor patients, who became objects of medical scrutiny by students and practitioners.

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the deep structures of human thought, over the relationships among language, experience, and epistemology that literally and metaphorically allowed certain things to be known and other things to remain unknowable. … In decided contrast, Erwin Ackerknecht, in his *Medicine at the Paris Hospital 1794-1848* (1967), situated the birth of the 'new' medicine within the 'political and technological revolution' in France after 1789. A more conventional historian, Ackerknecht argued that the political and social changes associated with the French Revolution underlay the fundamental philosophical and intellectual transformation in medicine that allowed it to finally put neo-Hippocratism and Galenism aside" (1996, 14). See Wilson on Roy Porter's conflict with Foucault's account of clinical medicine: "In short, where Foucault depicted discontinuity, Porter installed a continuous story. And this disagreement is by no means confined to these two authors, for much the same contrast is to be found between the writings of Russell Maulitz (who treats pathology as effectively beginning with the Paris school, apart from and not to Morgagni) and Othmar Keel (who has argued vigorously against Foucault's claims for the novelty of the Paris school)" (2007, 28-9). See also Figlio 1976, Keel 1985, Maulitz 1987, and Mazumdar 1983.

[50] "Caution about the word 'experiment' when applied to clinical experience, for example, displayed elite practitioners' concern to balance appropriate conservatism in practice—one does *not* experiment on patients—with a properly innovative spirit—one *does* experiment judiciously on patients—or how else would medicine advance? Hospital men negotiated this tension quite carefully, deploying a rhetoric of 'observation' and 'judgment' that supported their status as men of good character as well as good science" (Lawrence 1996, 21).

> Of course hospital relationships per se neither created clinical detachment nor invented the clinical significance that patients had for medical observers. Such attitudes were as old as systematic medical practice itself. Yet hospital teaching underlay a new sort of hospital medicine in the eighteenth century because it made seeing hospital patients as the objects of detached clinical observations part of *routine* hospital experience for practitioners and large numbers of transient pupils. (Lawrence 1996, 27)

In other words, the emphasis on hospital patients as "objects of detached clinical observations" as routine to educating the practitioner evolved within a complicated framework.

The London medical corporations' disinterest in standardized medical education encouraged the conditions of ad hoc medical training at the hospitals. Despite this laissez-fair attitude, the tripartite division between practitioners was replicated in the hospital wards. The training students received in the wards of the London hospitals was managed under the established labels of physician, surgeon, and apothecary. To illustrate, a "walking pupil" under the tutelage of a physician would typically attend rounds with the physician and have access to the physicians' books. By contrast, a surgeon "walking pupil" would also attend rounds with a surgeon but could also visit patients off rounds and watch operations and postmortems (Lawrence 1996, 109). An important aspect of the pupil-teacher relationship was that it was a short-term cash relationship. The student paid a fixed amount per year for the privilege of walking the wards.

The ideology of the Scottish Enlightenment characterized by concern with the social and economic improvement of society as well as educational enrichment of students, motivated and guided the development of the Infirmary (Risse 1986, 58). Edinburgh's Infirmary, or hospital for the sick poor, opened its doors on August 6, 1729.

This was the first voluntary hospital in Scotland and had a profound impact on the advancement of medical education at Edinburgh's medical school. A pamphlet published by "Some Gentleman" in 1730, characterized the infirmary as a social need, economic benefit, and an opportunity for instructional advantage.[51] The hospital was funded by subscriptions encouraged by the Royal College of Physicians, Edinburgh.[52] The current finances at any given time dictated the number of patients admitted to the Infirmary and their suitability for teaching purposes (Walton 1976, 73). Over time, the Infirmary had to make rules for student observation. In 1741, the hospital managers required tickets to observe in order to control the flow of students and apprentices.

> During the 1750s the charges [for tickets] were put up and the issue of tickets was adjusted to the beginnings of the University terms in November and May. Perpetual tickets were introduced authorizing attendance in the wards for life at a cost of seven and a half guineas. By 1767 the income to the Infirmary from tickets was £390, representing one-fourth part of the whole annual revenue. This had the desirable effect of yet increasing the willingness of the Managers to co-operate with the University in improving the facilities offered. (Walton 1976, 77)

In 1756, Alexander Monro the second, William Cullen, and Robert Whytt joined the clinical lectures. Each lectured twice a week for five weeks, covering a total duration of five months (Walton 1976, 78). Prior to this, university professors did not routinely give infirmary lectures (Risse 1986, 38).

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[51] See *An Account of the Rise and Establishment of the Infirmary*, 1730.

[52] The Royal College of Physicians, Edinburgh, was founded in the seventeenth century. "The list of the original 352 subscribers contains the names of many of the Scottish nobility and landed gentry. The legal profession is very well represented by Senators of the College of Justice, Advocates and Writers to the Signet. As was to be expected many of the Edinburgh physicians and surgeons subscribed, and there were also substantial contributions from Edinburgh merchants, Ministers of the Gospel, and Professors of the University" (Walton 1976, 71).

Relying on the patients as the subject of diagnosis and disease, the professors took advantage of the demographic for pedagogical and experimental purposes.

> Admission to the hospital was often a privilege of being acquainted with private subscribers. In return for free medical care, which they could hardly afford to pay for, the 'deserving' poor became in a sense 'clinical material,' especially in institutions like the Edinburgh infirmary, that were prominently involved in teaching. By virtue of their various ailments, hospital patients were welcome examples of a complex medical nosology as well as potential subjects for testing new treatments.
>
> (Risse 1986, 249)

Risse's remarks clearly indicate a tension between patients' needs and pedagogical objectives. In order to alleviate any suspicion on the part of the public, admittance to the teaching ward needed to promote the idea that the Infirmary provided equal or superior medical care. The university professors, particularly James Gregory, fought to maintain a reputable image for the teaching ward. Moreover, despite the University of Edinburgh's pedagogical innovations with regard to clinical instruction, students had limited contact with the patients in the Infirmary. Medical students had barely an hour a day to visit patients on their own. Because of this, many supplemented their training in the Royal Infirmary by spending several months in Paris or London walking the wards (Risse 1986, 272-3).

Despite these shortcomings, the system of clinical instruction in the Royal Infirmary was generally considered one of the important and distinguishing features of the education offered at the Edinburgh Medical School. A tract published near century's end, *A Guide for Gentlemen Studying Medicine at the University of Edinburgh*, states "[t]he Infirmary of Edinburgh is much superior to any similar institution in Britain for the purpose of medical education. The cases of patients are all regularly registered, and an

account of their situation is daily given by the attending physician" (1792, 45). The institutional integration of clinical instruction at the Royal Infirmary and the medical school curriculum was a successful innovation. It was one of several that contributed to the international fame enjoyed by the Edinburgh Medical School in the second half of the eighteenth century, and that would be identified as important touchstones in the reform discourse of the early nineteenth. These innovations will be taken up in detail in the following chapter.

Chapter Three

System, Science, and the Practice of Physic: William Cullen and the Edinburgh Medical School

In his *First Lines on the Practice of Physic*, William Cullen observed that, "from time to time, [it is necessary] to reform and renew the whole system [of Medicine], with all the additions and amendments which it has received and is then capable of" (Cullen, *First Lines*, 1:xiii-xiv). As professor of medicine at the University of Edinburgh, Cullen exerted enormous influence in shaping the progressive training offered there in the second half of the eighteenth century. His international fame as a medical thinker and teacher brought prestige to the Edinburgh medical school and helped establish it as a model to be emulated. The school was regularly evoked as an exemplar in the movement for a general reform of British medical education that would intensify in the years following his death in 1790.

The statement above, quoted from Cullen's most famous treatise, conveys his own reformist orientation and hints at ideas central to his individual efforts to "renew" the study and practice of medicine – to *add* to the store of medical knowledge and to *amend* its doctrines. In this chapter, I attempt to assess Cullen's contribution to the rhetoric of British medical education reform. Although Cullen did occasionally weigh in on political debates in the profession, I contend that his influence on such debates was exerted principally through the example of his teaching and through the widening endorsement of educational values he was largely responsible for institutionalizing in the Edinburgh medical curriculum. Focusing on Cullen's published medical treatises and

other documents derived from his lectures at Edinburgh, I seek to elucidate his pedagogical innovations by situating them in the intellectual context of the Scottish Enlightenment and relating them to his medical theories. I show how Cullen, embracing new scientific principles and methods, reconceived medical education by critically assessing and replacing existing doctrines. In his lectures and published texts, he promoted a similar critical and scientific outlook in students, emphasizing the development of powers of discernment, of an "acuteness of intellect" (Cullen qtd. in Thomson 1859, 484). To inculcate this rational and critical "habit of mind,"[53] Cullen offered students interpretive categories through which to give meaning to medical facts and theories. He taught systems of medicine that organized medical knowledge in a rational and consistent manner, but that also functioned heuristically as a guide to understanding and to therapeutic intervention. Medical principles were placed in a structure that was organized and consistent, but were subject to revision and flexible enough to accommodate the vagaries of healing practice. Appropriately, Cullen's teaching regularly focused on practice and included clinical instruction at the Edinburgh Infirmary; indeed, this was an institutional arrangement that Cullen worked to solidify and one of the features that distinguished the training provided at Edinburgh's medical school. I will show how Cullen's broad view of the requirements for the education of the "learned and skillful" physician was reflected in the overall curricular structure of the school.

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[53] In his essay "Habits of Thought, Structures of Feeling," Stephen Pender defines *habit* in relation to Aristotelian *hexeis*: "[habit] signals an embodied, material, circumstanced being in the world, a state of character engendered by training, repetition, and exigency" (2008, 284).

William Cullen: Brief Biography

Cullen was born in 1710 in Hamilton, Scotland, and spent his early years on a small family property.[54] He attended a local grammar school and later studied the standard humanities and mathematics curriculum at the University of Glasgow. After his university studies, Cullen was apprenticed to John Paisley, a member of the Faculty of Physicians and Surgeons in Glasgow. Paisley had a thriving practice and an extensive medical library. When Cullen was nineteen, he became ship's surgeon on a two-year trading voyage to the West Indies. Cullen's tenure on the ship inspired an interest in the effects of climate upon health. After returning to Britain, he spent one year in London and studied under an apothecary to learn more about the preparation and use of drugs.

Around 1732, Cullen returned to Scotland and with the benefit of a small inheritance was able to study philosophy and literature. These intervening years, before Cullen returned to study medicine at the University of Edinburgh in 1734, broadened and deepened his intellectual background and curiosity (Johnstone 1959, 33-4). Later, a key influence in Cullen's intellectual development would be his membership in the Philosophical Society of Edinburgh (PSE). The PSE was paradigmatic of the gentleman's intellectual milieu of mid-to-late eighteenth century Scotland. As a group, it was committed to the core values and aims of the Enlightenment, devoted to the production and diffusion of "useful knowledge," and more particularly to the promotion of Scottish achievement in these areas.[55] A primary aim of the PSE during its revival from 1748-

[54] The most detailed account of William Cullen's life remains Thomson 1859.

[55] The PSE was sustained by professors at Edinburgh University and the city's cultured elite, who shared an interest in natural philosophy and in the material improvement of Scotland: "Medical, chemical,

1768 was to demonstrate that Scottish "academic bodies dedicated to empirical, cooperative, and international endeavour were necessary to the discovery and publication of useful truths" (Emerson 1981, 134). Through its publication, *Essays and Observations Physical and Literary*, the society sought to "advertise the University [of Edinburgh] and to bring to the notice of Europeans its very successful medical school, whose faculty were to be [its] most regular[ly] publish[ed]" authors (Emerson 1981, 135). Lord Kames appointed Cullen to the society around 1755, and he became an active participant. In part through the PSE, Cullen developed a close personal friendship with David Hume (he was also Hume's physician) and with Adam Smith, both of whom influenced Cullen's thinking (Lawrence 1984, 340-44).

During his studies at Edinburgh (1734-1736) Cullen emerged as a key member of a small discussion circle that eventually evolved into the Royal Medical Society. After completing his studies at Edinburgh, Cullen returned to Hamilton and started a practice as a family doctor; he stayed in practice there for seven years. In 1740, Cullen completed his Doctorate in Medicine at the University of Glasgow and four years later moved to that city to start extramural lecturing in medicine at the university and to continue his private practice. He was assigned to teach the theory and practice of medicine in 1746, the first lecturer on this subject at Glasgow. Cullen's teaching at Glasgow displayed considerable breadth and depth. He lectured on chemistry and botany as well as medicine and materia

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agricultural, and physical topics seem to have dominated the Society's work in the early 1750s and suggest that at mid-century those who pursued these interests brought about its revival as a means of catering to them. The need to revive a Scottish academy was rooted in practical or utilitarian considerations centered on economic benefits to Scotland, as well as in the ideological needs of men who wished it to be as much an ornament to the Kingdom as they thought it an intellectual necessity in the cosmopolitan republic of letters" (Emerson 1981, 137).

medica. His teaching of these subjects was informed by his considerable experience in the basic sciences of most relevance and application to medicine. Throughout his life, Cullen maintained a special interest in chemistry.[56] An accomplished investigator, he was also an innovative teacher of the subject; he was apparently the first to utilize chemical diagrams in his lectures and employed practical demonstrations to good effect (Johnstone 1959, 38; Crosland 1961). He was also a committed mentor and worked side by side with his students in the laboratory that he convinced the University of Glasgow to provide. His teaching of botany at Glasgow, in which he employed the new Linnaean taxonomic system, was informed by his own practical botanical experience.[57]

In 1755, again with Lord Kames' encouragement, Cullen relocated to the University of Edinburgh as the professor of chemistry. When the professor of materia medica died in 1760, Cullen was appointed his successor. His Edinburgh lectures on materia medica were highly successful and in 1772, notes from his 1761 course, recorded by students, were printed, published, and circulated beyond Scotland.[58] In 1766, Cullen was appointed chair of physiology, then, in 1769, joint chair of medicine with John Gregory. Gregory died in 1773, leaving Cullen the sole chair of medicine at Edinburgh.

Cullen was an extremely popular lecturer (see below) and by the time he assumed the chair of medicine in 1773, his fame had already spread internationally. It continued to grow following the publication of a number of important textbooks and treatises. These

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[56] For Cullen's work in chemistry, see Donovan 1975; Christie 1993.

[57] In Hamilton, he had been entrusted with the management the management of the botanical garden attached to the residence of his patron (and patient) the Duke of Hamilton. See Thompson 1832, 17.

[58] The initial publication and distribution of his lectures on materia medica was done without Cullen's permission. Cullen later had to take legal action in order to be compensated for the sale of his lecture material. See Stott 1987.

included, *Nosology, or a Systematic Arrangement of Diseases* (1769); *Institutions of Medicine* (1772), a work of medical theory focused on physiology; and *First Lines on the Practice of Physic* (1777), Cullen's four-volume magnum opus on medical practice. In addition, an authorized version of his 1761 materia medica lectures -- *Lectures on the Materia Medica as Delivered by William Cullen, M.D.* – was published in 1773. At the end of his life, Cullen presented his revised and enlarged views on the subject in *A Treatise of the Materia Medica* (1789). These works – which taken together cover a wide swath of the theory and practice of medicine, of nosology and therapeutics—were hugely successful among medical students, teachers, and practitioners, and were released in numerous editions and in multiple languages.[59]

Cullen's eminence in his day was recognized in a number of prestigious appointments and fellowships. He was Fellow of the Royal College of Physicians and Surgeons of Glasgow (President in 1746-1747), the Royal College of Physicians of Edinburgh (President in 1773-1775), the Royal Society of Medicine in Paris, the Royal Societies of London and Edinburgh, and the American Philosophical Society, and he

[59] Cullen's first book, his treatise on nosology, was originally published in Latin (*Synopsis Nosologiae Methodicae*) in 1769; it was translated and published in English in 1785 and continued to be published through the 1820s. *Institutions of Medicine* was first published in 1772; subsequent editions appeared in 1777 and 1785, and a French translation was published in Paris in 1785. *First Lines on the Practice of Physic* went through numerous editions in England, Ireland, and the United States and was translated into French, German, Latin, Italian, and Spanish. Similarly, *A Treatise of the Materia Medica* was translated into French, Spanish, German, and Italian. See Bowman 1975, 211-12. The only sustained studies attending to the entirety of Cullen's published corpus are Thomson's early nineteenth-century synoptic treatments (which treat a good deal of unpublished manuscript material as well) (Thomson 1827, 1859), and the unpublished dissertations of Lawrence (1984) and Bowman (1975), the latter focused expressly on Cullen's theory of the nervous system. See also Doig, Ferguson, and Passmore 1993, a collection of important essays commemorating the bicentennial of Cullen's death.

served as First Physician to the King in Scotland from 1773. Cullen died early in 1790 shortly after retiring as chair of medicine at the University of Edinburgh.

Cullen, Science, and the Scottish Enlightenment

Cullen's approach to medicine was strongly influenced by the intellectual climate of eighteenth-century Scotland. The thought of the Scottish Enlightenment was characterized by "concern with the general rather than the particular, stressing problems such as theory of knowledge, universals, and causality" (Lawrence 1984, 206-7). He embraced the basic tenets of the Scottish Common Sense philosophers,[60] and developed a special affinity for the writings of his friends David Hume and Adam Smith. Moreover, as part and product of this intellectual milieu, Cullen adopted a fundamentally utilitarian conception of science and saw his teaching and treatises as contributing to the body of "useful knowledge" in medicine.

The local culture and politics of late eighteenth-century Edinburgh were supportive of such scientific pursuits. Patrons of the elite classes in Scotland sponsored intellectual societies, recommended university appointments, and funded scientific projects that could promote the interests of their class—which were broadly social,

[60] Lawrence summarizes: "The Common Sense philosophers accepted in their own fashion many of Hume's conclusions, notably his views on causation and the denial that reason alone could be a basis for knowledge of the material and spiritual world. The value of science was not called into question. In common with Hume they sought to use what they understood as the correct method of natural science to lay down the foundation of a proper science of mind, on which they hoped to erect a practical science of morality. … A feature of Common Sense philosophy related to this theory of method was its high valuation of ordinary language and its criticism of the more speculative works of philosophers" (Lawrence 1984, 278-285).

utilitarian, and directed to the public good.[61] Men of science were celebrated, and Cullen was part of this elite circle. Furthermore, Edinburgh was a city of considerable political power and much of the ample support and patronage of intellectual achievement and scientific inquiry was devoted to its medical school. For example, the Philosophical Society of Edinburgh would eventually issue three volumes of *Essays and Observations, Physical and Literary*; these featured contributions by all of the main professors in the school: Robert Whytt, the two Alexander Monros, James Gregory, and Cullen himself.

Cullen fully appreciated the significance of the scientific "revolution" of the preceding century, picking out for special mention the mathematical reasoning of Galileo and the method of induction pioneered by Bacon. He especially valued the latter, as well as Bacon's emphasis on experimentation, as a crucially important advance in natural philosophy (*First Lines,* 1:xvi). But interestingly, Cullen observed that these "new modes of philosophizing," and the revolutionary discoveries they had helped bring to other sciences by that time, were slow in coming to medicine (*First Lines,* 1:xvi-xvii). As will be discussed below, Cullen saw himself on the forefront of the effort to hasten the new science into medical theory and practice, often citing scientific criteria to discount past theories and to justify his own.

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[61] See Emerson 1993 and 2008: "Men in all the Scottish political factions … had an interest in keeping the universities ideologically sound. Scottish politics [during the Enlightenment] revolved around the management of Scottish society through patronage. … The patronage of the universities almost always served particular local patrons connected with politicians who mattered nationally. … Those who dispensed patronage in the eighteenth century gave [Scotland] its medical schools, good science training and the moral and social philosophy which taught boys their duties in a world growing more complex and commercial. … Scotland's history in this period was more influenced by these patrons than is often realized" (2008, 4-10).

Cullen as Pedagogue: Teaching Methods and Influence

Cullen was an accomplished and tremendously influential teacher. Much of his popularity rested on the quality of his lectures; indeed, Julius Rocca observes that, "As a lecturer, he had few, if any rivals" (2007, 92). Cullen's lectures were noteworthy for several reasons. He delivered them in English, not Latin. This was a significant choice. Not only did it make his lectures easier to follow by students not well versed in Latin,[62] but also "perhaps allow[ed] him to expand his views more spontaneously where this seemed expedient" (Johnstone 1959, 35). Cullen's lectures showed a lively wit and included passages of biting criticism as well as anecdotes drawn from his personal experience. Though muted in his published treatises, J. K. Crellin has observed that these qualities show through in the many archived manuscripts of lecture notes taken by students in his Edinburgh courses (1971, 79).

In addition to his "clarity of thought and expression, his vivacity, his candour and his excellence in communicating ideas and stimulating enthusiasm for self learning" (Doig 1993, 32), Cullen showed a sympathetic awareness of students' needs,[63] and he developed a strong personal rapport with students that carried to social interactions outside the lecture hall. These qualities endeared him to a remarkably diverse and distinguished group of students including Joseph Black (pioneering chemist and

[62] Scotland's universities had more accessible admissions criteria than did Oxford and Cambridge, and lectures would also be attended by many non-matriculated students. W. F. Bynum observes that Cullen did deliver lectures on botany in Latin in his early teaching in Glasgow, and that his writings show he was clearly at ease in the language (2004, 2).

[63] As Crellin remarks, the unpublished introduction to his 1761 lectures on the materia medica demonstrate Cullen's "sharply critical outlook and the care he took in tailoring his course to the needs and the capabilities of his students" (Crellin 1971, 80).

physician), John Coakley Lettsom (founder of the Medical Society of London), Sir Gilbert Blane (whose medical reforms of British Navy included the introduction of citrus for the prevention of scurvy), and Robert Willan (founder of British dermatology). Cullen exerted an especially strong influence on a number of American students including John Morgan (founder of the American Philosophical Society), William Shippen, Jr. (who delivered the first anatomical lectures in North America), Samuel Bard (personal physician to George Washington), and Benjamin Rush (member of the Second Continental Congress and Signer of the Declaration of Independence). Each of these men played prominent medical roles in the Revolutionary War, and they also carried Cullen's influence and that of the Edinburgh Medical School into the foundation, structure, curriculum, and emphases of the earliest American medical schools: in 1765 Morgan and Shippen established the first North American medical school at the College of Philadelphia (now the University of Pennsylvania), and Bard founded the first medical school in New York expressly on the Edinburgh model.[64]

Cullen's popularity as a teacher can be assessed quantitatively as well. Whitfield Bell, Jr., notes that Cullen's first Chemistry lectures at Edinburgh, delivered in 1755,

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[64] For Cullen's students, see Rocca 2007, 92-3, and, focusing on his influence on American medicine, Bell 1950; Doig, Ferguson, and Milne 1993, 40-46; and O'Donnell 1993. As one bit of testimony on this influence, consider Benjamin Rush's comments from a letter to Cullen written in the fall of 1783: "One of the severest taxes paid by our profession during the war [of American Independence] was occasioned by the want of a regular supply of books from Europe, by which means we are eight years behind you in everything. Your First Lines [*First Lines of the Practice of Physic]* was almost the only new book that was smuggled into the country. Fortunately it fell into my hands. I took the liberty of writing a preface to it, and of publishing it during the war. . .". Rush continues, "The American edition had a rapid sale and a general circulation throughout the United States. It was read with peculiar attention by the physicians and surgeons of our army, and in a few things regulated in many things the practice of our Hospitals. . . Thus, Sir, you see you have had a hand in the [American] revolution by contributing indirectly to save the lives of the Officers and Soldiers of the American Army" (Rush 1940 [1783], 456).

registered seventeen students, but that "[t]he next year there were fifty-nine. So popular were his lectures and so rapidly did the medicals school grow, partly because of them, that in his ninth course, in 1763, Cullen taught a class of one hundred forty-five" (Bell 1950, 276). Cullen was evidently well-suited to excel in the peculiar system of faculty compensation that prevailed at Edinburgh and the other Scottish universities:

> An Edinburgh professor derived his emolument, out of which he met the expenses associated with mounting his class, mainly from class fees and secondarily from examining. His basic annual stipend was inevitably low; indeed five Edinburgh medical professors received no salary whatsoever, which acted as a strong stimulus to erect and maintain not only a large class but also a lucrative … private practice. … At the beginning of an academic session each professor received a salutary reminder about a basic source of his livelihood when he collected two or three guineas, depending on the class, from every prospective member. … [A system which] stressed payment by results and by popularity.
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> (Morrell 1971, 160-61)

The "pay-by-popularity" model, though it could discourage pedagogical innovations or the maintenance of rigorous standards of evaluation that might alienate students, did encourage careful preparation and the organized, thoughtful presentation of the subject, and it clearly rewarded lecturing skills. This system of remuneration also worked to encourage publication (see Morrell 1971, 164, 166). Publication was not an expectation for tenured professors, but treatises and textbooks, once in circulation, would enhance the author's reputation and help spread his fame, and so draw more students, at home and abroad, to his institution and his courses.

Although contemporary scholars generally do not consider Cullen an especially significant medical thinker, all agree that, in his own day, Cullen's reputation as a teacher played a huge role in the growth – both in size and in international prestige—of the

medical school at Edinburgh: "Cullen represented pedagogic excellence which was a key factor in the international influence of the Edinburgh medical school" (Rocca 2007, 97). Of course, Cullen's numerous publications extended this influence far beyond the lecture halls at Edinburgh. But in fact, these too should be considered of a piece with his classroom and clinical teaching. His treatises' content originated from his years of lecturing. All were meant to be, and were, used as textbooks for medical students.[65] Indeed, Cullen seems to have recognized his role as fundamentally pedagogical: "[A]s soon as I was employed to teach a more complete system of the Practice of Physic, I judged it necessary to publish a Text-book, not only for the benefit of my hearers, but that I might also have an opportunity of obtaining the opinion of the Public at large" (*First Lines,* 1:xi). The tremendous popularity of Cullen's texts, I would contend, can be attributed to some of the same features that made his lectures so appealing. They preserve, for example, the sharp criticisms of past medical theory and doctrines. Similarly, they reflect the coherent and precise arrangement of his lecture courses, which Cullen organized around "systems" of his own devising. These overlaps between his teaching and writing are indicative not only of a tightly integrated pedagogical corpus, but also, as subsequent sections will show, of Cullen's reformist stance.

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[65] Joanna Geyer-Kordesch has remarked that developments in eighteenth-century medicine "pertain, first, to a bona fide corpus of contemporary medical practice and theory that was *not* derived from tradition, but claimed to be new and observational, and, secondly, its systematized dissemination through teaching and textbooks" (1995, 96). She notes, further, a lack of studies devoted specifically to the textbooks used in the progressive university medical schools (96 n. 5), a situation that does not seem to have changed since the publication of her study.

Cullen the Reformer-Teacher: Amending Medical Doctrine

The questioning of past medical doctrines was an important aspect of Cullen's approach to medical knowledge and instruction. His introductory lectures to the various courses he taught unvaryingly included a short historical review in which Cullen identifies and critically assesses past doctrines and points out their flaws. These passages regularly raise a challenge to the authority of the ancient medical writers.[66] In his introductory lecture to his 1761 course on the materia medica,[67] for example, Cullen comments on the sources of information concerning the "Virtues of Medicines," i.e., the efficacy of different medications, observing that:

> if we have recourse to the Writers on this subject we find them extremely fallacious, their writings being nothing but compilations from bad sources, generally indeed from the ancients, in whose favour we are apt to be too much prejudiced from a superstitious Veneration, as it were, and fondness for antiquity. In matters of genius they may perhaps have equat'd if not excelled the moderns; in matters where judgment is necessary they must fall short, not having the experience and number of Facts which the moderns have to direct them. In some parts of Learning, such as Oratory and Poetry they may be allowed their Excellence. As we freely condemn those who wrote on this subject 200 years ago why may we not with greater Freedom condemn those who wrote 2,000 years ago. . .[?] ("Unpublished Introduction," 86)

This feature of Cullen's introductory lectures is also found in the (sometimes lengthy) prefaces to his published treatises. In the opening of his *Nosology,* Cullen's treatise on the theory and classification of diseases, he observes:

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[66] R. W. Johnstone has suggested that Cullen's choice to give his lectures in English may have been motivated, in part, by a desire to "weaken[. . .] the authority of the ancients whose works were all in Latin or Greek" (1959, 35).

[67] This introductory lecture, unpublished in Cullen's day, is presented by Crellin (1971) from a manuscript deposited in the Wellcome Institute.

> It is, indeed, a general opinion, that the ancient Greek and Roman physicians, were very industrious and acute in observing and recording the phenomena of diseases, and that many useful histories of this kind are extant in their writings. *But, in my opinion, a foolish and superstitious veneration of antiquity, or a certain affectation of learning, has, in this matter, procured for the works of the ancient physicians, an unmerited degree of estimation. (Nosology,* ii; emphasis added)[68]

Cullen's insistence that a proper understanding of health, disease, and therapy required vigilance against the uncritical assimilation of past theories applied equally to doctrine of more recent vintage. His critical reviews of medical theories regularly conclude with specific, detailed discussion of major eighteenth figures and their views. At the center of Cullen's effort to "renew" medical theory, education, and practice was his work in physiology or the "animal œconomy." The inner-workings of human physiology had been a subject of considerable debate since the seventeenth century.[69] As I pointed out in Chapter Two, Boerhaave's mechanistic theory held sway in the early and mid-eighteenth century. Boerhaave's teaching at Leiden represented the most up-to-date and progressive medical instruction at the time. The Boerhaavian course was institutionalized by Cullen's predecessors at the inauguration of Edinburgh's medical school, and Boerhaave's two treatises, the *Institutes* and the *Aphorisms* – treating medical theory and healing practice, respectively – were the standard textbooks.

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[68] For another example, consider Cullen's comments in the Preface to his *First Lines on the Practice of Physic:* "[I]t appears to me, that the general doctrine of *Nature curing diseases,* the so much vaunted *Hippocratic* method of curing, has often had a very baneful influence on the practice of physic; as either leading physicians into, or continuing them in, a weak and feeble practice; and at the same time superseding or discouraging all the attempts of art" *(First Lines,* 1:xxiii-xxiv).

[69] The classical paradigm of the physiology textbook was Galen's *On the Natural Faculties* (2nd century A.D.). Physiology textbook publication increased markedly in the 17th century, supported by "regental and internal university support of scientific research" in that period (Rosseau 1976, 144). Rousseau contends that the seventeenth-century physiology textbooks were "ultimately attempts to answer Cartesian science" (1976, 144).

For Cullen, valid questions of medical inquiry centered on physiology and the ways in which medical students were being taught outmoded theories. Cullen sought to overturn/reform the outmoded approach to physiological knowledge. Cullen insisted a proper understanding of medical practice required vigilance against the uncritical assimilations of past physiological theories. Cullen's commitment to breaking with past doctrines of teaching medicine is evidenced in his writings, where he grounds his reformist impulse in his scientific worldview.

Cullen favored two strategies of investigation with regard to physiology, one philosophical, and the other method-bound. His philosophical physiology centered on the nervous system. He spent most of his time in his physiology lectures explicating the role of the nervous system. His approach to the nervous system differed from that of his predecessors or peers. While Cullen shared the view that the actions of the nervous system pivoted on the phenomena of sensation, he resisted a simple reduction of life to either intellectual or mechanical parameters (Lawrence 1984, 323). In this regard, Cullen was neither a strict mechanist nor a strict vitalist. He preferred a union of previous theoretical perspectives. His physiology becomes method-bound in his clarification of diseases. The aim of this methodological nosology was to help students accurately distinguish between diseases. His nosology was intended as a conceptual framework to eliminate irregularities in disease classification.

Cullen's approach to physiology has significance not only for its connection to Scottish life and culture in the late eighteenth century,[70] but also for its implications for

[70] "Cullen's theory [of physiology] was a virtually naturalistic account of the activity and principles that were central to all Scottish philosophy, that is the internal sources of behaviour, the instincts, passions,

integration of classification into medical education and practice. As outlined in Chapter One, the burden of medical education is to teach the student both abstract theory and practical intervention, to Cullen's mind, it seemed that the two work together insofar as the physician makes use of disease classifications (nosology) to analyze the specific illness of a particular patient. Cullen's key pedagogical innovation is shifting the focus from the individual patient to nosology in medical education. Teaching classification of disease would enable students to avoid overlong patient disease histories that Cullen viewed as inconsistent and often overlapping. The methodological nosology still aids in treatment of the individual patient, but the *classification* itself gains primacy in medical education. Cullen is still well before the positivistic science of the nineteenth century, but his work in physiology and nosology is an important precursor to it.

More than instructions to his students on how to proceed in medical practice, Cullen's texts served to inculcate a habit of mind that broke from the speculative medical systems "which have hitherto prevailed" (*First Lines* 1:xiv). Cullen adopted methods from other, more established disciplines, such as botany but applied them to physiology in a new way.[71] For Cullen, physiology was linked to the nervous system and sensation, and these "moving powers" of physiology led all inquiry that considered diseases occurring in the human body. He urges his students and readers to see physiology through the primacy of the nervous system, but also to rely on methodological nosology

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desires, and so forth. Since for Cullen sensation was the basis of all activity this meant that the factors affecting it were crucial in the development and modification of all physiological activity, behaviour and thought. The *quality* of the sensation was ultimately the factor governing the *quality* of life" (Lawrence 1984, 332-33).

[71] "[T]he scenes of inquiry of the new 'vitalist' physiology were in large measure determined by methods derived from emulation of other, more firmly established, disciplines" (Jardine 1991, 104).

for treating patients. Cullen's nosology claimed Linnaean methodological precepts, which he abstracts and applies freely to the classification of disease.

The goal for Cullen is clear: to reform existing medical education by structuring a solid pedagogy in order to groom students to develop scientific habits of mind in the context of education and subsequently medical practice. An understanding of the still-present humanism in medical education, but the failure of medical humanism to account for inductive, fact-based methods of inquiry illuminate Cullen's approach to teaching, which gestured toward a nascent scientific medicine. Cullen's work seeks to correct past physiological theory, culminating in his reform of some of the central doctrines of teaching medicine.

Cullen's Nosology as "Modes of Inquiry"

If one accepts Struever's claim that intellectual history is really *the history of modes of inquiry*, then Cullen's work offers a rich site for tracing a momentous development in the history of medicine insofar as it expresses and encapsulates medicine's shift to a "scientific" mode in the late eighteenth century at the University of Edinburgh. Past conventions of teaching medicine were based on habits of thought characteristic to rhetoric, an "*ars,*" as opposed to science "*scientia*."[72] Cullen was suspicious of teaching medicine fundamentally as a humanistic art and based his doctrines first in reason, not conjecture. In assessing Cullen's approach to medical

[72] Walter Ong describes this difference as a varied type of logic: "[R]hetoric … which govern[s] the … use of words … [is an] individual art. … [A] logical art … [it is] not only a *habitus* of the intellect (all arts are this) but a *habitus* directive of the operations of the intellect itself. And yet [it is] not of the same species of logic as that according to which science (scientia) proceeds; for the connections in logic of rhetoric … are not the necessary connections which exist in the logic of demonstration" (1942, 25).

knowledge formation, i.e., revaluing, reassessing and asserting doctrine, it is useful to clarify three key terms: *mode of inquiry*, *humanist inquiry*, and *scientific inquiry*. I draw my understanding of "mode of inquiry" from Nicholas Jardine who asserts that a type or mode of inquiry is constituted by "the range of questions that are locally real … in a community of practitioners of a given discipline at a given time … [and] there is an intimate connection between the local reality of questions and the understanding of questions" (1991, 4). Humanistic inquiry finds its *habitus* in the particulars of human experience—the contingent. Insofar as medicine's resonance with humanistic inquiry gains purchase with a comparison to rhetorical modes of thought, I invoke this useful definition from Michael Leff: "[R]hetoric [as humanist is] a universal activity that finds its habitation only in the particular. … Its adaptive genius cannot be circumscribed by the fixed boundaries of theoretical constructions" (1999, 62). Finally, scientific inquiry is an investigative initiative that aims to provide general laws and has a novel relation to practice. Gadamer argues "with the idea of the unitary method of understanding [in science] … the ideal of certainty [reliability] became the standard for all understanding" (1996, 5).

Here, I look at Cullen's definitions of medicine and physiology as well as his call for reform of medical education. Additionally, I examine Cullen's explication of disease to illustrate how his understanding of disease demonstrates his desire to base doctrines of medicine on scientific inquiry. Cullen felt obligated to deliver a system of doctrines and rules to his medical students that were sound and universally applicable in medical

practice. Finally, Cullen's attention to particular methods of nosology suggests that his notion of scientific inquiry necessitates adherence to particular methods.

The beginning line of *Institutions of Medicine* states, "medicine is the art of preventing and curing diseases" (5). Cullen divides the institutions of medicine into three parts: (1) the treatment of life and health, (2) a general doctrine of diseases, and (3) a general doctrine on the means of preventing and curing diseases. For Cullen, physiology is the doctrine that explains the "conditions of the body and of the mind necessary to life and health" (7). The nervous system is central to Cullen's understanding of physiology:

> The nervous system, as the organ of sense and motion, is connected with so so many functions of the animal œconomy, that the study of it must be of the utmost importance, and a fundamental part of the study of the whole œconomy. … In the living man, there is an immaterial thinking substance, or MIND, constantly present; and every phenomenon of thinking is to be considered as an affection or faculty of the mind alone. But this immaterial and thinking part of man is so connected with the material and corporeal part of him, and particularly with the nervous system, that motions excited in this give occasion to thought; and thought, however occasioned, gives occasion to new motions in the nervous system. (23-8)

Several key things happen in Cullen's passage above. First, he favors the nervous system as fundamental to the whole study of physiology. Cullen was not the first medical theorist to point out the nervous system as central to understanding physiology. In 1747, Robert Whytt (a predecessor to Cullen at Edinburgh) added a non-material rational agent to Boerhaave's mechanism. This non-material rational agent governed involuntary activity through the nervous system (Lawrence 1976, 88). Whytt called this the "sentient" principle. For Whytt, a patient's temperament was now governed by sensibility rather than a humoral theory of fluids. But, the basic concept of restoring a correct balance to

the patient, in this case "sensibility" rather than "fluids," remained unaltered from previous humoral accounts. The key innovation for Whytt was that the bridge between the mind and body was the nervous system. Cullen differed from Whytt insofar as his account of the nervous system "made continuity a neurological phenomenon and independent of any of the arguments about the existence of the soul, either in man or in animals" (Lawrence 1984, 332). For Cullen, the soul was limited only to the "seat of consciousness."[73]

The nerves were the key to physiological motion. The way in which the nerves produced motion depended on "impressions" or "sensation." Cullen writes "sensation and volition, so far as they are connected with corporeal motions, are functions of the brain alone; and we presume, that sensation arises only in consequence of external impulse producing motion in the sentient extremities of the nerves" (*Institutions* 30). Because Cullen differed from Whytt in terms of the neurological function acting independent of the soul, his approach to physiology demanded a rational explanation. The requirement that the nervous system be untouched by the soul to create involuntary movement allowed Cullen to direct his physiological ideas on a more rational foundation. The soul as no longer necessary to bodily motion removes the individualistic mandate from physiology. Cullen maintains the soul as integrated with his physiological theory of the nervous system, in other words he does not resort to mechanism, but the soul operates a certain kind of voluntary nervous movement. Cullen defines two types of sensation that

[73] Thomas Willis' *Pathology of the Brain* (1667) was the paradigmatic work that located the soul in the brain. "If indeed the soul is limited to the brain, as Willis and his followers … contended, then nerves alone can be held responsible for sensory impressions, and consequently for knowledge; it also follows that the nerves must necessarily be hollow tubes rather than solid fibres, so that the brain's unique secretion, animal spirits, can freely flow through them to the body's vital organs" (Rousseau 1976, 146).

affect the nervous system: (1) "those which arise from the impulse or impression of external bodies" and (2) "those which arise from the mind's being conscious of its own action and the motion it excites" (*Institutions* 34). These changes to physiology in the late eighteenth century had important intellectual implications. Theodore Brown suggests that the move to a strict vitalism at Edinburgh and the disavowal of Boerhaavian mechanism "coincided with a change in the natural philosophical climate, the rise to the surface of the Newtonian proto-positivist methodological stream, and the social transformation of the community of physiologists" (216).[74]

Unseating the soul in Cullen's vitalism had implications for constructing a more rigorously scientific physiology. Emphasis on a general function of the nervous system took the focus off of the individual and allowed a more generalizable understanding of the workings of the body in medicine.[75] Cullen does concede that sensation or impressions will have different individual effects, but "this must arise from some difference in the state of the bodies acted upon" not to the actual physiological laws (*Institutions* 45).

> As to the mechanism of the brain, suited to its several functions, is not at all perceived, and at the same time, as very few of these functions are carried on without sensation and volition, it must appear from this, and

[74] See also Jardine (2000): "General methodological precepts which claim wide jurisdiction … [is evidenced] by the fortunes of Newtonian method in eighteenth-century physiology. … [T]he example of Boerhaave and the teachings of his followers brought the strictly mechanistic approach into disfavour. Instead there was pursued in the name of Newton and his four rules of reasoning in philosophy a variety of experimentally oriented non-mathematical approaches which cautiously forswore the attempt to specify *verae causae* for the phenomena described … so-called 'vitalism' came into prominence. Newtonian method was still invoked: the vital forces were treated by analogy with gravitation as general properties of matter whose inner nature is entirely inaccessible to us, but whose *modus operandi* can be investigated through experimental study of physiological phenomena" (102-3).

[75] Figlio (1977) notes that "[t]he idea of vitality, constrained in its expression by the material organisation in which it resided, ultimately allowed the primary emphasis to be placed upon that organisation itself. … heavily upon organisation" (273).

> many other considerations, that the mechanism of the brain would not be sufficient for the purpose, without being united with a sentient principle, or mind, that is constantly present in the living system. But, at the same time, it is with little probability alleged, that the administration of the corporeal functions is entirely directed by the mind acting independently of the body, and with intelligence perceiving the tendency of impressions, and exciting such motions as may favour the beneficial, or obviate the hurtful tendency of all causes acting upon the body. We are certainly conscious of no such administration. Many impressions have their effects without sensation or volition. (*Institutions* 89)

Undoubtedly, Cullen endorsed a general principle of physiological function that is not contingent upon the "soul" or a "sentient" principle. In addition to noting that the brain or "sentient" principle is not necessary to direct the corporeal functions of the body, Cullen clearly describes that impressions affect the body without sensation or volition. Perhaps more importantly, Cullen suggests that movement does not require the mediation of a sentient principle; it does not require constant conscious thought. In suggesting this, Cullen demonstrates that physiology can be based on foundational principles not contingent upon a soul, but also that the soul can *still be* integrated into his system of physiology. In other words, he eschews mechanism, but does not embrace an unabated vitalism. He seeks for a rational ground.

In *First Lines on the Practice of Physic,* Cullen legitimates his system of physiology by critiquing the inherited systems and their outmoded approaches to medicine. Here, Cullen explicitly addresses the intellectual history of his profession offering an assessment of its strategies of investigation. He begins his critique with Georg Ernst Stahl, moves to Friedrich Hoffman and finally to Hermann Boerhaave. These

outmoded theories, Cullen contends "certainly produce that caution and timidity which have ever opposed the introduction of new and efficacious remedies" (1:xxiv).

> I might go farther, and show how much the attention of the *Autocrateia*, allowed of, in one shape or other, by every sect, has corrupted the practice among all physicians, from Hippocrates to Stahl. It must, however, be sufficiently obvious, and I shall conclude the subject with observing, that altho' the *vis medicatrix nurture* [healing powers of nature] must unavoidably be received as fact; yet, wherever it is admitted, it throws an obscurity upon our system; and it is only where the impotence of our art is very manifest and considerable, that we ought to admit of it in practice. (xxv)

Cullen is concerned with therapeutic advance. In other words, Cullen did not agree that nature was the only curative measure in healing a patient.[76] When a physician leaves everything to nature, it is difficult to measure the efficacies of current systems of physic. Cullen placed greater trust in a skilled physician than in nature running its course. Cullen perceives revision to former systems/theories of medicine as an important part of advancing medical practice and thought.

Cullen's revision to inherited medical theories allows him to legitimate his particular medical system and practice by reinforcing a particular view of the physician's role.[77] In legitimating his own contributions, Cullen has to critique but also do justice to

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[76] "In general, physicians working within humoral pathology explained disease as an effort of the *vis medicatrix naturae* [healing power of nature] to expel the morbific matter in the bodily fluids. Since such fluidist accounts were unacceptable to Cullen, he modified the concept of the *vis medicatrix naturae* in accordance with his theory of the nervous system" (Bowman 1975, 148-49).

[77] The physician … the traditional role up to this point was for a physician to take the case history of patients. The physician would observe patterns of the patient at the sick bed but maintained a noninterventionist posture. Rather than continue a humoral theory of physiology, Cullen emphasized a nosology of disease that would allow physicians to find the best method of cure. Furthermore, Cullen's theory of physiology was neurologically based—or dependent on the "moving powers" of the nervous system. One caveat: "Even Cullen's neurophysiological framework was highly speculative and incapable of shedding much light on actual disease processes or mechanisms promoting healing. Practitioners were painfully aware that both physiochemical and neuropathological explanations consistently failed to clarify

past systems of medicine. Moreover, to show his relevance, he must emphasize his break with the past.[78] Cullen presents his theory of physiology as a necessary revision to prevent the proliferation of outmoded medical theories and misguided medical education.

> [I]t is necessary, from time to time, to reform and renew the whole system, with all the additions and amendments which it has received and is then capable of. That at present this is requisite with regard to the Science of Medicine, will, I believe, occur to every person who at all thinks for himself, and is acquainted with the Systems which have hitherto prevailed. (*First Lines* 1:xiii-xiv)

In addition to noting that revision to medical systems is periodically necessary, Cullen clearly claims that in order for the science of medicine to inhabit the proper framework it must be reformed to reflect methodological innovation. Writing in the vein of a pragmatic Enlightenment medical history, *First Lines* assumes "a single line of progress culminating in the present … treating progress as causally explicable, as the outcome of education, patronage, and the application of sound methods" (Jardine 2000, 127-28). Cullen perceives a reformed medical system as predominantly tied to scientific investigation, wherein sound methods as opposed to conjecture, is applied to generate cures. In particular, Cullen's desire to create a "system" of medicine, not a theory based

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bedside events. Thus physicians were frequently forced to return and consider discredited humoral schemes that seemed to harmonize with clinical reality" (Risse 1986, 178).

[78] Nicholas Jardine assesses the pragmatic Enlightenment histories [showcasing theoretical progress in learning itself as opposed to seventeenth-century erudite histories of prominent thinkers] of which Cullen's *First Lines* typifies: "[I]n the latter part of the eighteenth century … these works take for granted the victory of the moderns over the ancients … and the history of the sciences is now confidently reconstructed as a progress towards their current superior status. … Theoretical and practical development of disciplines, rather than the lives and development of the disciplines, rather than the lives and opinions of their practitioners, became the central motifs. And there is much concern with the causes of progress in the sciences. … Above all, pragmatic histories are openly didactic in intent, concerned to show how reason properly applied triumphs over superstition and fantasy to unveil the truth" (2000, 127-28).

on uncertain hypotheses,[79] constitutes a direct contrast to rhetorical modes of thought that have a history in medical practice. In essence, Cullen argues that renewal and reform of the whole system of medicine with "additions and amendments" will allow medicine to more closely inhabit scientific modes of thought. *First Lines* is concerned with the way in which a new understanding of physiology, based on the importance of the nervous system and further acquisition of empirical evidence, would bring a scientific focus to medicine.

Nancy Struever has convincingly argued that the Enlightenment desire for system building excludes rhetorical modes of inquiry from explanatory power (2009, 10). Indeed, rhetoric's inherent *modality* resists system building as a result of rhetorical modes of inquiry. It is the connection between the contingent and the probable that allows rhetorical inquiry its modality. Struever contends that a description of rhetoric as inquiry should take a pragmatic[80] approach insofar as it is concerned with temporality and necessity, not universalism.

> There is … a very thick history of rhetoric as an alternative formation and oppositional investigative initiative. It seems perverse to argue that there is a larger, encompassing, and archetypically philosophical concern which invests rhetoric with much of its interest and power as inquiry. … The most inclusive inquiry rubrics are those of modality: necessity, contingency, actuality, possibility. … Rhetoric both defines and *poses* possibilities, both finds and creates, energises possibilities. But this task

[79] Cullen's notion of "uncertain hypotheses" suggests a reaction to reasoning from first principles "whose aim was to provide an account of nature in terms of principles demonstrated to be true" (Bowman 1975, 162-63). Moreover, Cullen sought to eliminate unnecessary speculation and unfounded hypotheses from medicine.

[80] Struever argues: "The description of rhetoric as inquiry should employ … the Peircian pragmatic approach … where he claims the investigative core is the set of beliefs that generate the habits of action in inquiry. … Peirce's linkage of beliefs and habits gives us a formula marked by modesty and happily, 'rhetoricalness.' The modesty, or radical inclusiveness, is of use to the consideration of inquiry in general, while the rhetorical values resonate with rhetoric's topical concerns: its engagement with a community's beliefs, shared opinions (*endoxa*), and with rhetoric's inveterate habits of activity, persuasion as practice and goal. … [A]ll must be located, assigned value in process, an activity turgid, stained by uncertainty, a process cluttered by demands for (investigative) action. 'Impure' inquiry, in short" (2009, 3-4).

> raises more issues; the modal notions must be considered in their relation to each other, but also to the elements of chance, coincidence, and to the hypothesis of determinism, a determinism that would undermine rhetoric's obligations to use and to response, and also to the obtrusive presence of categories of time, truth, change. (Struever 2009, 5-7)

So, contrary to universal system building, rhetorical habits "constitute a remarkable array of inquiry strategies" (Struever 2009, 74). Enlightenment system building appealed to the universal through a systematic coherence that assumed "necessity as mode"[81] rather than "assuming a continuous engagement with possibility in order to cope with necessity" (Struever 2009, 71-73). In short, rhetoric functions outside ideological or systematic certainty. The Enlightenment-scientific engagement with systems and universal/abstract explanatory systems, for example Cullen's methodological nosology, makes claims to serve every possible context; systems are generalizable rather than particular. Put differently, the patient's experience becomes the test bed to verify scientific facts, contrary to experience as the starting point for generating inquiries to produce medical knowledge or decide on a cure. He offers recourse to experience when induction fails. Cullen introduces a new possibility of medical inquiry, building on the past but revising it based on new scientific discoveries and rational thought—characteristic of Enlightenment modes of inquiry. Cullen serves as an interesting crossover figure in medical education.

Advocating a new mode of inquiry for medicine, Cullen relies heavily on the language of system insofar as he develops certain "necessitarian" theses of scientific investigation. Necessitarian in the sense that physiology must appeal to a more universal audience and have deterministic qualities to account for disease patterns. To develop his claims, Cullen must appear to do justice to the contributions to medical knowledge

[81] To clarify, Struever refers to axiomatic thinking in philosophical inquiry, i.e. in the vein of Cartesianism.

preceding him. On the other hand, to emphasize his own contributions, he clearly breaks with the past and advocates a new system of inquiry for medicine. Cullen achieves this balance by presenting his own position as an amendment to past systems that no longer serve the present purposes of medicine. He also avoids affiliation with any one precursor of medical thought by citing multiple ancestors. Progress in medicine, for Cullen, has culminated in the need for a more robust theory of the nervous system as well as a methodological nosology. His predecessors of the mechanistic school argued that muscle fiber was the basic unit of action essential to physiological function. Departing from Boerhaavian mechanism but aligning himself with his colleagues Whytt and Gaubius, Cullen advocates that the nervous system possessed the inherent quality of life for physiological functions.

> [For Cullen] all diseases would be 'nervous' in the sense that the so-called 'moving powers,' which one considered in accounting for disease, were related to the nervous system. … However, as Cullen himself admitted, referring every disease to the disorders in the nervous system would not contribute much to pathological knowledge. Physiological functions were so complext that it would be naïve to attribute every disease to the nervous system alone, although diseases ultimately involved neural functions. (Bowman 1975, 143-44)

The centrality of the nervous system for physiology allows Cullen to demonstrate that his notion of physiological theory is closer to the truth than his predecessors. The language of renewal is prevalent in *First Lines*, "I think it is necessary for me to point out particularly the imperfections and deficiencies of the Boerhaavian system, in order to show the propriety and necessity of attempting a new one" (1:xxxv). Thus, Cullen

affiliates himself and his style of inquiry with progress in medicine and medical education.

Cullen believes that medicine attentive to science demands an empirical methodology. He repeatedly invokes empirical practices against speculative theories of medicine. For example, "The distinction of t he genera of diseases, the differentiation of the species of each, and often that of the varieties, I hold to be a necessary foundation of every plan of Physic, whether Dogmatical or Empirical" (*First Lines* 1:xliii-xliv). To hearken back to Struever, rhetorical modes of inquiry are dominated by possibility. "[T]he mode of possibility demands invention as skill … possibility has the force of modifying necessity and tempering deterministic initiatives" (2009, 73). While medicine has to work within possible outcomes of disease and a physician must be inventive with his patients' cures, Cullen wants his new system to have more deterministic qualities that allow a universal assessment of disease processes in relation to physiology, nosology and pathology.

> [F]or when many new facts have been acquired, it becomes requisite that these should be incorporated into a system, whereby not only particular subjects may be improved, but the whole may be rendered more complete, consistent, and useful. Every system, indeed, must be valuable in proportion to the number of facts that it embraces and comprehends. (*First Lines* xli-xlii)

It should be noted that Cullen takes great pains to emphasize the methods proper to his new system of medicine.

Throughout Cullen's writings, there is an insistence on the importance of establishing more scientific methods of cure based on cautious induction. Cullen's

language suggests that he views the collection of verifiable medical facts as possible within medical study and that significant correlation to disease is possible.

> I have endeavored to collect that facts relative to the diseases of the human body, as fully as the nature of the work and the bounds necessarily prescribed to it would admit: But I have not been satisfied with giving the facts, without endeavoring to apply them to the investigation of proximate causes, upon these to establish a more scientific and decided method of cure. In aiming at this, I flatter myself that I have avoided hypothesis, and what have been called *theories*. I have, indeed, endeavored to establish many general doctrines, both physiological and pathological; but I trust that these are only a generalization of facts, or conclusions from a cautious and full induction: and if any one shall refute to admit, or directly shall oppose, my general doctrines, he must do it by showing that I have been deficient or mistaken in assuming and applying facts. … Further, to obviate any dangerous fallacy in proposing a method of cure, I have always been anxious to suggest that which, to the best of my judgment, appeared to be the method approved by experience, as must as it was the consequence of a system. (*First Lines* 1:liv-lv)

Insofar as there is a specific methodological protocol to validate or invalidate specific explanations of disease, there is no such thing as the "Cullen method." Certainly, however, there is Cullen's quest for applying nosological facts to the investigation of proximate causes in order to find a more precise method to cure patients. Here again, Cullen dismisses theoretical, speculative or hypothetically driven medical claims. To emphasize, Cullen states that he "flatter[s] [him]sef that [he] has avoided hypothesis, and what have been called *theories*." Cullen's dismissal from physiology all theoretical questions that are not amenable to empirical investigations of disease and cure underscores his deep commitment to shifting medical modes of inquiry to a scientific foundation.

A prime example of Cullen's critique of medical thought founded upon conjecture, hypothesis, or deductions of reasoning is found in *First Lines*.

> It is … possible for a judicious physician to avoid what is vulgarly called theory, that is all reasoning founded upon hypothesis, and thereby many of the errors which have formerly taken place in the Institutions of Medicine. It is possible also for a person who has an extensive knowledge of the facts relative to the animal œconomy in health and in sickness, by a cautious and complete induction, to establish many general principles which may guide his reasoning with safety … he may with great advantage establish a system of practice chiefly founded on the doctrine of proximate causes. But when this cannot be done with sufficient certainty, the judicious and prudent physician will have recourse to EXPERIENCE alone. (1:60-61)

Cullen remains committed to the idea that to cure diseases, a physician must found his therapeutics on the knowledge of proximate causes. He specifically points out that to do this, a physician must be acquainted with the "Institutions of Medicine; that is, the knowledge of the structure, action, and functions of the human body." His caveat to this method of practice is to acknowledge, "our knowledge of these particulars … is still incomplete … [and] in many respects doubtful, and has often been involved in mistake and error" (*First Lines,* 1:61). Cullen does not, of course, object to uncertainty in physiological knowledge: on the contrary, he repeatedly recognizes that physiology continues to progress as the body of facts grows. Hence, medicine by its very nature inhabits uncertainty.[82] Rather, his objection lies in speculative hypotheses or theories that are not founded upon induction and, to his mind, have no place in the practice of medicine. He finds this objectionable insofar as what he terms *theories based on hypothesis* (i.e., conjectures) have not established "general principles" to guide a physician's reasoning safely. These *theories* belong to the old systems of medicine that were not based on careful examination of evidence and induction. Cullen warns that

[82] "Cullen regarded his physiological and pathological doctrines as theoretical and temporary, but also as the necessary basis of medicine. His system was an inspiration of further work, not a final summary of medical knowledge" (Lawrence 1984, 372).

medical systems based on hypotheses—particular those that appeal to *a priori* grounds—are prone to determine their validity based on a given hypothesis rather than against empirical statements. Cullen and other eighteenth-century Scottish thinkers believed that Newton's *regulae* were important criteria for validating empirical or inductive reasoning. In other words, induction was axiomatic for reasoning in medicine.[83] For most Scottish philosophers and scientists inductive-driven systems of thought were consistent with reliable science. So, available evidence and accumulated facts were a necessary condition to accept a medical system. The goal was to separate untrue, hypothetically driven theories from legitimate scientific ones.

Cullen does not go so far as to posit that induction as a method is infallible. Influenced by Humean skepticism, Cullen did not see a complete uniformity in nature; rather, he wanted to establish a more generalized scientific paradigm for the study of

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[83] "[Cullen] was by far the most outspoken and skeptical teacher visiting the infirmary. … Cullen indeed insisted that students be fully acquainted with the sources of uncertainty and error in medicine. He repeatedly stressed in his lectures that every pupil should be aware that it was difficult to make complete observations. Lack of attention, bias in favor of certain medical systems, partiality toward specific remedies—all were for Cullen sources of false experience. Above all, Cullen stressed that there was no place for a rigid adherence to the hypotheses and theories of previous medical authorities" (Lawrence 1984, 260). Furthermore, Cullen and his contemporaries were greatly influenced by Newtonian inductive science: "Newton was seen as the harbinger of an inductive, experimental learning which proceeded by a gradual ascent from the particulars of observation to general laws which were true and virtually incorrigible. What Bacon had prophesied in the way of an inductive interpretation of nature, Newton had brought to fruition. … [I]t was Newton's inductivism and experimentalism—in short, his peculiar kind of empiricism—rather than his optics or his mechanics that motivated the leaders of 18th-century English intellectual history. … [Interestingly it was Cullen's colleague Thomas Reid (1710-96) who] was the first major British philosopher to take Newton's opinions on induction, causality, and hypothesis seriously. … One of the foundational stones of Reid's philosophical system and the central attitude he adopted from Newton, was his suspicion of, bordering on contempt for, any theories, hypotheses, or conjectures which are not *induced* from experiments and observations. … It was a characteristic of the time to lampoon hypotheses and their proponents and to treat them as anachronistic legacies of the pre-Newtonian era. … What tended to happen, therefore, was that the older meaning of 'hypothesis' (as an axiom or postulate) came to be confounded with the notion of an unempirical or untestable proposition. Where the two had been clearly distinguished, they were now indiscriminately confused and the legitimate arguments against *a priori* and untestable hypotheses were mistakenly used against all hypotheses whatever. … [Reid] calls [Newton's] *regulae* 'the axioms upon which men reason in physicks'" (Laudan 1981, 86-9, 95-6).

physiology. Furthermore, he explains that when a physician cannot address a patient's case based on the knowledge of proximate causes then he has recourse to experience. On several occasions in *First Lines*, Cullen cites recourse to experience when science fails; this suggests that a method of generalized experience can enhance scientific facts. "I have always been anxious to suggest that which, to the best of my judgment, appeared to be the method approved by experience; as much as it was the consequence of a system" (1:lv). However, Cullen's primary mode of approaching medicine is advocating his empirical methodology, that is, generalized truths acquired through observation.[84] As Lawrence points out, "For their theory Edinburgh physicians [were influenced by] the rigid dictates of Herman Boerhaave. In their practice they were influenced by the therapy available and the need to describe clearly the irregularities of sickness. In theory they were Newtonians, taxonomists embracing an ontological view of disease, in practice they were humouralists dealing with the unrepeatable clinical event" (1976, 81).

Like many eighteenth-century physicians, Cullen was committed to a classificatory approach to diseases. Classification of diseases was influenced by the Baconian view of science and encouraged by the success of botanists in systematizing plants. Classifying diseases rested upon the premise that the disease itself was consistent enough in nature and occurred with enough regularity and similarity that classification was possible. Cullen's goal was to establish a nosology "based on external appearances alone" (Lawrence 1976, 84). He built his nosology upon four classes: *Pyrexiae* (febrile

[84] Risse notes "Cullen questioned every observation, judgment, and conclusion made at the bedside. When it came to patient care, he adopted an almost empirical attitude and remained his own harshest critic, freely acknowledging errors and omissions in lectures. Yet medical theory, he insisted, was a necessary organizing instrument employed to link and arrange facts. … What ultimately mattered was the direct clinical experience as the *only* guide to diagnostic judgments and therapeutic indications" (1986, 278).

disorders), *Neuroses* (nervous disorders), *Cachexiae* (anatomical modifications and physical wasting) and *Locales* (local disorders). Cullen accepted, without hesitation, the assumed similarity in the problems of classifying plants and diseases (Bowman 1975, 162-63). Much of Cullen's nosology was not based on any clear idea of disease, since reliable medical data was not available in the eighteenth-century. "The understanding of disease processes would eventually require knowledge of etiological factors, the anatomy of diseased parts, and the knowledge of normal and abnormal functions—areas in medical science which slowly came into light as the nineteenth century progressed" (Bowman 1975, 175).

Cullen's language in *Nosology, or a Systematic Arrangement of Diseases* (1800) suggests that he views a methodological nosology as fundamental to medical education. "But while the most experienced physicians are often at a loss to discriminate diseases, they justly complain that nothing is to be found in medical books to assist in solving their doubts … [a] more complete, and more accurate histor[y] of diseases … defined by more distinct characters than we can at present have recourse to, are greatly wanted" (i). It seems that Cullen viewed a systematic nosology as important in bringing order to pathology not only to recount histories of diseases but also to create an up-to-date classificatory scheme. Directed by scientific and pragmatic motives, Cullen's intent in classifying diseases was to organize them scientifically; hence, creating a "short hand" from which physicians could decide on a method of cure for patients once the disease had been identified.

SYNOPTICAL VIEW OF THE CLASSES, ORDERS, AND GENERA.

To face page 23.

CLASS I.—PYREXIÆ.

ORDER I. *FEBRES.*

§. 1. *Intermittentes.*

1. Tertiana.
2. Quartana.
3. Quotidiana.

§. 2 *Continuæ.*

4. Synocha.
5. Typhus.
6. Synochus.

ORDER II. *PHLEGMASIÆ.*

7. Phlogosis.
8. Ophthalmia.
9. Phrenitis.
10. Cynanche.
11. Pneumonia.
12. Carditis.
13. Peritonitis.
14. Gastritis.
15. Enteritis.
16. Hepatitis.
17. Splenitis.
18. Nephritis.
19. Cystitis.
20. Hysteritis.
21. Rheumatismus.
22. Odontalgia.
23. Podagra.
24. Arthropuosis.

ORD. III. *EXANTHEMATA.*

25. Variola.
26. Varicella.
27. Rubeola.
28. Scarlatina.
29. Pestis.
30. Erysipelas.
31. Miliaria.
32. Urticaria.
33. Pemphigus.
34. Aphtha.

ORD. IV. *HÆMORRHAGIÆ.*

35. Epistaxis.
36. Hæmoptysis.
37. Hæmorrhois.
38. Menorrhagia.
39. Catarrhus.
40. Dysenteria.

CLASS II.—NEUROSES.

ORDER I. *COMATA.*

41. Apoplexia.
42. Paralysis.

ORD. II. *ADYNAMIÆ.*

43. Syncope.
44. Dyspepsia.
45. Hypochondriasis.
46. Chlorosis.

ORD. III. *SPASMI.*

47. Tetanus.
48. Trismus.
49. Convulsio.
50. Chorea.
51. Raphania.
52. Epilepsia.
53. Palpitatio.
54. Asthma.
55. Dyspnœa.
56. Pertussis.
57. Pyrosis.
58. Cholica.
59. Cholera.
60. Diarrhœa.
61. Diabetes.
62. Hysteria.
63. Hydrophobia.

ORD. IV. *VESANIÆ.*

64. Amentia.
65. Melancholia.
66. Mania.
67. Oneirodynia.

CLASS III.—CACHEXIÆ.

ORDER I. *MARCORES*

68. Tabes.
69. Atrophia.

ORD. II. *INTUMESCENTIÆ.*

§. 1. *Adiposæ.*

70. Polysarcia.

§ 2. *Flatuosæ.*

71. Pneumatosis.
72. Tympanites.
73. Physometra

§. 3. *Aquosæ.*

74. Anasarca.
75. Hydrocephalus.
76. Hydrorachitis.
77. Hydrothorax.
78. Ascites.
79. Hydrometra.
80. Hydrocele.

§. 4. *Solidæ.*

81. Physconia.
82. Rachitis.

ORD. III. *IMPETIGINES.*

83 Scrophula.
84. Syphilis.
85. Scorbutus.
86. Elephantiasis.
87. Lepra.
88. Frambesia.
89. Trichoma.
90. Icterus.

CLASS. IV.—LOCALES.

ORDER I. *DYSÆSTHESIÆ.*

91. Caligo.
92. Amaurosis.
93. Dysopia.
94. Pseudoblepsis.
95. Dysecoea.
96. Paracusis.
97. Anosmia.
98. Aghenstia.
99. [illegible]thesia.

ORD. II. *DYSOREXIÆ.*

§. 1. *Appetitus Erronei.*

100. Bulimia.
101. Polydipsia.
102. Pica.
103. Satyriasis.
104. Nymphomania.
105. Nostalgia.

§. 2. *Appetitus deficientes.*

106. Anorexia.
107. Adipsia.
108. Anaphrodisia.

ORD. III *DYSCINESIÆ.*

109. Aphonia.
110. Mutitas.
111. Paraphonia.
112. Psellismus.
113. Strabismus.
114. Dysphagia.
115 Contractura.

ORD. IV. *APOCENOSES.*

116. Profusio
117. Epidrosis.
118. Epiphora.
119. Ptyalismus.
120. Enuresis.
121. Gonorrhœa.

ORD. V. *EPISCHESES.*

122. Obstipatio.
123. Ischuria.
124. Dysuria
125. Dyspermatismus.
126. Amenorrhœa.

ORD. VI. *TUMORES.*

127. Aneurisma.
128 Varix.
129. Ecchymoma.
130. Schirrus.
131. Cancer.
132. Bubo.
133. Sarcoma.
134. Verruca.
135. Clavus.
136. Lupia.
137. Ganglion.
138. Hydatis.
139. Hydarthrus.
140. Exostosis.

ORD. VII. *ECTOPIÆ.*

141. Hernia.
142. Prolapsus.
143. Luxatio.

ORD. VIII. *DIALYSES.*

144. Vulnus.
145. Ulcus.
146. Herpes.
147. Tinea.
148. Psora
149. Fractura.
150. Caries.

Linnæus, Vogel, and Sagar, have in general followed the classification of Sauvages. But as there are many of their classes, such as the Vitia, Anhelationes, Dolores, and Fluxus, which are neither natural nor proper, I have here adopted a more simple, and I think, in general, a more proper classical arrangement. It may perhaps appear the less perfect that it does not clearly distinguish between diseases affecting the whole system, enumerated under the three first classes, and those affecting only a particular part, placed in the fourth class, or the *Locales*. I allow that this may be the case, though seldom. Nothing better however occurs to me at present; and for the reasons assigned in the preface, p. vii. I am not very solicitous about a perfect classical arrangement.

Figure 3.1: Cullen's Nosological Classification System

A major undertaking, Cullen's system of nosology sought to correct past classifications of disease. Aware that a perfect system would not be attained, he insisted that an attempt at a more accurate classification was necessary. "And though we may not be able to attain to such a system as will be in all cases certain and accurate, the attempt itself will be of great advantage" (*Nosology* viii). Construction of a nosological system that corrected the past's errors would be a major undertaking for Cullen. In particular, as with any broad inquiry, Cullen faced problems of scope.

> It is certainly a very difficult thing in Nosology to say what is really a true species, or what is only a variety; as those marks which serve to distinguish species from varieties in Zoology and Botany, are not to be found in diseases. I therefore considered it as safest and even necessary, to enumerate many varieties. And as I esteem such a distinction very useful in practice, I have every where endeavoured to make it: not always, indeed, with equal certainty, but often, at least, with some degree of probability. … And I am of the opinion that diseases which differ only in degree, constitute merely varieties of a certain species. (xiii)

Above, Cullen draws our attention to the fluid categories of disease and the difficulty they present in nosology as an exact science. In this passage, Cullen confronts the difficult problematic of working and teaching in a discipline that must balance theory and practice. There is, of course, nothing new about this confrontation; however, Cullen sought to make nosology more reliable for teaching practices than past systems of disease classification.

As he carved out the major classes of disease, Cullen shows a concern with questions of a "generalizable patient." He gestures to the importance of "discovering" similarity in disease patterns among patients insofar as students can learn the skill of discriminating similarity from difference.

> [A]s I am on the subject of the distinction of diseases from one another, I shall take this opportunity of observing, that there are two circumstances of considerable importance in discovering similitude or affinity of diseases in different persons. The one is, that similitude in the cause of disease, argues a similitude in the disease thence arising: thus, when the diseases of two different persons arise from one and the same cause; when that cause is essential to the production of the disease in both; and when the same cause appears to be of the same quality, we may safely infer that such diseases are of the same, or of a similar kind. (xiv-xv)

This approach to nosology articulates the role in medicine of universally distributed "disease" patterns in patients.[85] This played a substantial role in medical education and practice insofar as Cullen's methodological nosology began to calibrate new modes of medical inquiry against precedents and standards of physiology and pathology. Cullen's emphasis on validating a universal understanding of disease endorses a more scientific approach to medicine. This approach makes its way into the educational practices at the University of Edinburgh.[86]

Cullen's Focus on *System* Reorients Medical Pedagogy toward Science

A recommended curriculum did exist at the Edinburgh medical school; however, a small portion of the student body followed it. Key historians of medicine have reviewed the specifics of different students' positions at the University of Edinburgh in order to

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[85] In his treatise on nosology, Cullen also explains "the other circumstance which may shew the similarity of diseases in different persons, is a similarity in the remedies by which they are cured. For the resemblance of diseases really consists in the agreement of their proximate cause, whatever that may be: and as remedies cure diseases only in so far as they remove their proximate causes, we must therefore consider those diseases to be of the same nature which are cured by the same means" (*Nosology* xvi).

[86] "[Cullen] introduced simplification into the existing systems of classification by using a group of symptoms as the basis of classification, thus remaining more truthful to the teachings of Sydenham. Again, following Sydenham and contemporary nosologists, Cullen believed that individual diseases exist and that they can be distinguished and classified. If this contention makes him appear an adherent of the view that disease is an entity, at the same time he regarded disease as a process" (Bowman 1975, 208).

understand the pedagogical impact of Cullen and other medical educators between 1770 and the early nineteenth century.[87] Additionally, an important primary document, *A Guide for Gentleman Studying Medicine at the University of Edinburgh*, explicates and recommends a typical educational structure for a medical student at this time. The medical lectures given annually at the University of Edinburgh medical school in the late eighteenth century were in anatomy, botany, chemistry, institutions or theories of medicine, materia medica, midwifery, practice of medicine and lectures on patient cases at the Royal Infirmary of Edinburgh. A scholar of the history of Edinburgh's medical school, Lisa Rosner's extensive study of medical education at there centers on the following:

> Young men became medical students at Edinburgh University in order to set up medical practice. This apparently trivial statement is actually loaded with four assertions about the majority of Edinburgh students: first, that they were men, second, that they were young, third, that their education was deliberately chosen to enable them to set up practice, and fourth, that they believed study at Edinburgh would help them do that. (1991b, 11)

An image of the medical students at Edinburgh as "rational economic actors, choosing whichever courses would best serve their educational and professional needs" stemmed from the influence of Adam Smith (Rosner 1991b, 4). Students' choices and professors' offerings reflected a redefinition of medical education from a classical liberal education for a gentleman as enough for medical practice to modifying medical subjects as more scientifically focused (Rosner 1991b, 35). Not only was there a sophisticated adaption of the concept of a classical liberal education to medical subjects, but also a new locus of

[87] See Barfoot 1993; Bonner 1995; Chitnis 1970; Comrie 1932; Dow and Moss 1988; Frank 1973; Lawrence 1976; Morrell 1971; Newman 1957; Poynter 1966; Risse 1986, 1987, 1992, 2005; and Rosner 1991b.

medical education was the hospital—in particular the Royal Infirmary of Edinburgh. As the later part of the eighteenth century progressed, no longer was classical medical education seen as useful but only seen as prestigious. To make pedagogy more user-friendly, professors at Edinburgh "presented courses and wrote textbooks that assumed no knowledge of the classics [and] based [them] on eighteenth-century medical concepts, observations and vocabulary" (Rosner 1991b, 37).[88] In short, medical education was losing its direct link to classical studies.

For a concrete picture of the courses offered at the University of Edinburgh, one has to examine the matriculation records as well as the records of curriculum offerings. These have been well-documented by Lisa Rosner. Although matriculation was not necessary to attend classes at the University of Edinburgh, students did have to pay a fee to professors to attend their courses and receive a ticket.

[88] Rosner also explains "The division between ancient and modern was not absolute … both Hippocrates and Celsus could be adapted to eighteenth- and early nineteenth-century medical ideas. But instead of being the foundation of medical study, they became stylistic ornaments, recommended, not required reading" (1991b, 37).

Figure 3.2: sample student ticket to Alexander Monro's Anatomy and Surgery course

The formal matriculation records were the source for the university to track students. All classes at the medical school met five days a week, except for the clinical lectures at the Royal Infirmary that met only twice a week (Rosner 1991b, 47). Cullen arranged his lectures according to his principles of nosology, which continued to be a dominant pedagogical tool at Edinburgh until well after his death in 1790. Although lectures were given in English, exams were administered in Latin until the 1820s.

Course Offerings and Sample Schedule of Classes 1763-1826:[89]

Winter Session

Materia Medica	8-9am
Medical Practice	9-10
Chemistry	10-11
Medical Theory	11-12
Royal Infirmary open to students	12-1pm
Anatomy and Surgery	1-3
Midwifery	3-4
Clinical Lectures (Tuesday and Friday)	4-5
Clinical Surgery (Monday and Thursday)	5-6
Military Surgery	2-3
Medical Jurisprudence	1-2

Summer Session

Botany
Clinical Lectures
Clinical Surgery

Source: Rosner 1991b, Appendix B

Figure 3.3: Edinburgh Medical School Course Offerings 1763-1826

In *A Guide for Gentlemen Studying Medicine at the University of Edinburgh* (1792),[90] J. Johnson describes the content of each course as well as the method for studying each subject. "The following sheets are offered, with much respect, by their obliged pupil, the Author." In his pamphlet, Johnson explains the advantages of a medical education at the University of Edinburgh, which are "denied [students] in other universities" (1). The main advantage Johnson perceived was the lack of regulations or constraints on course of study. The courses commenced on the last Wednesday of

[89] Average course attendance out of total medical students according to Rosner's research spanning 1763-1826: Anatomy and Surgery 65%, Chemistry 76%, Medical Practice 61%, Medical Theory 37%, Clinical Lectures 33%, Midwifery 27%, Materia Medica 38%, and Botany 25% (57).

[90] See Appendix A for a detailed description from Johnson's *Guide* of the "classes" of students at Edinburgh's medical school and the recommended plan for medical study correlated to each demographic.

October and concluded at the end of April each year; students were charged three guineas for each course attended. Lectures given in the Royal Infirmary on patient cases were offered in the winter and the summer only (Johnson 1792, 4-5). The growing importance of systematic scientific subjects on medical education manifests in Johnson's description of chemistry:

> Chemistry being the art of discovering the effects of heat and mixture on the various substances of nature, presents to every individual of mankind important and interesting subjects of enquiry. To the philosopher it furnishes views of the most exalted kind; to the practitioner of the healing art, it affords means for discovering many valuable remedies; and to the people in general, it exhibits the nature of all substances, in so far as such knowledge is necessary for the purposes of life. Chemistry is now, therefore, with much propriety, considered as a branch of general education. (15)

Johnson emphasized the theoretical importance of a course like chemistry to medical students. However, he noted student objections to Dr. Joseph Black's pedagogy: "It has been objected to Dr. Black's course, that it does not include sufficient number of practical directions for students of medicine. These objections are urged only by those who prefer a few mechanical rules to scientific knowledge, for if the principles of chemical operations be accurately understood, the practical rules may be very readily acquired" (16-17). Scientific knowledge was central to doctrines of Edinburgh's medical discipline and educational focus. Science oriented the student to the proper end of medical study, namely, the use of science to enhance medical practice. Moreover, there was every indication in Johnson's pamphlet that medical curriculum at Edinburgh consciously put science to use in pedagogy.

Johnson articulated for readers of his guide the most efficient method of studying chemistry. The professor gave regular lectures on subjects in chemistry, but often the medical student had to select the best treatises to read tandem with the course. On this point, Johnson recommends the most useful treatise on chemistry:

> Although the publications on chemistry have, within these few years, become very numerous, yet it is difficult to recommend any one as a syllabus to Dr. Black's lectures. Chaptal's works, in three volumes, will, perhaps, answer that purpose better than any other. The student ought to read over, very carefully, Chaptal's observations on the subjects of the lectures, immediately (or as soon as possible) after having heard the professor, and should write down the general principles. (17-18)

In a general sense, training in scientific subjects such as chemistry provided the Edinburgh medical student with a common scientific vocabulary relevant to medicine—particularly in relation to the Continental medical schools on which Edinburgh had modeled its medical curriculum earlier in the eighteenth century. Johnson's outline of the importance of chemistry to medical education reflects the growing concern for science as an important facet of medical education at Edinburgh.[91] Science was becoming a mark of prestige for medical schools, and the late eighteenth century at Edinburgh medical school manifests this pedagogical shift.

The Royal Infirmary of Edinburgh offered one of the few opportunities for medical students to see patients. With the use of hospital teaching as essential to medical education at Edinburgh, prior to the rise of the Paris clinical school in the 1790s,

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[91] Morrell points out: "Serious students could easily see that Edinburgh's great advantage over Oxford and Cambridge lay in the wider range of available subjects from which they could choose according to their needs and aspirations. While Oxford and Cambridge stressed classics and mathematics respectively, Edinburgh voraciously spanned professional and liberal education in its characteristic emphasis on medicine and philosophy. Not surprisingly, science at Edinburgh occupied an important position in both the medical arts and faculties. … [T]he medical courses formed the chief magnet to students interested in science" (1971, 169).

Edinburgh's medical school was the best in Europe (Morrell 1971, 170). Cullen was an advocate of clinical lectures and made sure to teach them.

> For Cullen, nosology was not only a necessary effort to discern individual disease states and get a grasp of the entire panorama of sickness; it was likewise the key for an improvement in therapeutics. … In Cullen's view, as more patients were seen, especially in hospitals and dispensaries, new genera of disease could be established and a number of 'imperfectly related' ones dropped or possibly reclassified. … Cullen's [nosological] categories implied the existence of a large number of disease species. These entities, defined purely by clinical criteria and based on the characteristic unfolding of symptom sequences, were considered to be as real as plant and animal species and part of the natural world order. (Risse 1986, 116-18)

But, Cullen's neurophysiological framework and disease classification system did little to improve therapeutics. Despite the lack of advance in therapeutics, clinical teaching became an important part of medical pedagogy. Most of the clinical judgments made were qualitative, highly speculative, and vague. Indeed, as Cullen pointed out "most clinical phenomena had not been well enough described and differentiated to justify specific therapeutic indications" (Risse 1986, 259). A marked success of the Edinburgh medical school was its effective integration of clinical teaching into the rest of its curriculum; furthermore, the organization of this clinical teaching around Cullen's nosological system. Methodological nosology offered "convenient explanations and categories for organizing and expressing information" in the clinic (Risse 1986, 278). In this sense, the bedside in the clinic enabled an empirical framework for the generalizable patient.

Johnson offers a section dedicated to the Royal Infirmary in his *Guide*. He argued that the Infirmary was superior to any similar institution in Britain (45). Medical students

were not allowed to attend to medical cases until they had acquired the "general principles of the practice of medicine" (46). Students attended both clinical lectures and clinical surgery twice a week, respectively.

> The cases of the patients are all regularly registered, and an account of their situation is daily given by the attending physician. Two ordinary and an assistant physician have the charge of medical patients; and the members of the royal college of surgeons take each in rotation the management of the chirurgical patients for the space of two months at a time. (Johnson 1792, 45)

The patients at the Royal Infirmary were limited to those admitted by charity, which meant students acquired experience with diseases of the poor (Rosner 1991, 55). Clinical training at Edinburgh included the opportunity for students to have access to the ward journals and copy entire case histories for educational reference. The Edinburgh professors conducted clinical instruction, and students were allowed to visit patients for one hour prior to this instruction period (Risse 1987, 6-7). This instruction was intended to illustrate existing medical knowledge. For Cullen, it provided the opportunity to put his methodological nosology to use in pedagogy. The pedagogical tendency in clinical instruction was attention to "simplified clinical classifications, a more flexible vitalistic physiopathology, and the growing importance of local pathology" (Risse 1987, 16).

The integration of clinical lectures and hospital teaching prompted new educational guidelines for the University of Edinburgh. Formal regulations for surgical education were worked out at Edinburgh between 1804 and 1808, when they were finally published for the first time. The Royal Commissioners for Visiting the Universities and Colleges of Scotland in 1826 called for more rigorous standardization of medical education at Edinburgh. These regulations were published in *The Medical Calendar* in

1828 (Rosner 1991, 161). The regulations did not drastically alter the medical curriculum at Edinburgh, but they made the course of study required not flexible. In 1825, just before the commissioners' study, new graduation requirements were put in place. "In order to protect the value of their degree and their own reputation, Edinburgh medical professors had to ensure that their graduates were … scientific physicians" (Rosner 1991, 172).

Conclusion

The position of science in medical education at Edinburgh—under the watch of Cullen and the influence of Cullen's pedagogical innovations well into the nineteenth century—draws from Cullen's key pedagogical principle of teaching careful induction and systems of classification for disease. An organized and coherent presentation of medical topics distinguished Cullen's teaching, showcasing his adoption of "system" as "an integral part of the process of learning medicine" (Barfoot 1993, 116). Science gave Cullen's pedagogy a grounded coherence and, to his mind, allowed medical curriculum to advance and progress. Moreover, scientific medicine in medical education and curricula inculcated different habits of mind in medical students. In the late eighteenth century educational scenario at the University of Edinburgh, one can readily identify the emergence of a scientific medical pedagogy based on Cullen's dominant doctrine of systems.

Chapter Four

British Medical Periodicals and the Rhetoric of Reform, 1805-1830

During the late eighteenth and early nineteenth centuries in Britain, the medical periodical emerged as an important new forum for communication among scholars, teachers, and practitioners. Typically functioning as organs of the growing number of scientific academies, learned societies, and professional organizations, these publications likewise increased in number and diversity in the period.[92] In Britain, this growth accelerated from around 1800 and although there was a movement toward increasing specialization in publication, it was a period of intense competition among players in the emergent medical "press."[93] Then, as now, medical journals were a means of disseminating knowledge—reporting new discoveries, and sharing new therapies, etc.—and for promoting professional events and activities, but they also were an important venue for the discussion of pressing issues facing the medical discipline. Through periodicals, many perspectives were brought to conversations about the state of medical science and practice. Chief among the concerns expressed in British periodicals in the early nineteenth century related more specifically to medical education and teaching. The periodicals presented "diagnoses," so to speak, of the current state of affairs and a range

[92] On the linked development of scientific societies and periodical publication over the seventeenth and eighteenth centuries, see Vickery 2000, 72-95. Curiously, medical periodicals in this and later periods are completely ignored in the important recent work by rhetoricians of science focused on the history of scientific communication; see Gross, Harmon, and Reidy 2002 and Harmon and Gross 2007.

[93] Reference sources for British medical periodical publications in the period include Garrison 1934, Leiper 1931, Morton 1990, and Porter 1992b. Bynum, Lock, and Porter 1992 is an important collection of essays on the topic.

of suggested "therapeutic" interventions. Articles complaining about the state of British medical education—for example, as compared to that on the Continent—or about the shortcomings of contemporary education generally were matched by others that lauded the instruction available at certain British schools and/or condemned that of others; still other articles and editorials presented specific proposals for small- or large-scale education reform.[94]

The periodicals' important role in furthering medical reform was recognized even in the period.[95] Though it has received some scholarly attention,[96] there have been no studies devoted specifically to the periodicals as a forum for debate over medical education. In this chapter, I investigate the disciplinary rhetoric of medical periodicals from the early nineteenth century. I examine articles that expressed deepening concerns about the status of British medical education, focusing on those published between roughly 1805 and 1830 in three important journals: the *Edinburgh Medical and Surgical Journal* (*EMSJ*), the *London Medical and Physical Journal* (*LMPJ*), and the *Medico-Chirurgical Transactions* (*MCT*). Influential and long running representatives of what I term the "first wave" of early nineteenth century British medical periodicals,[97] these

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[94] See, for example, Kind 1827, "Medical Education in England" 1827-8; Graves 1832; "Medical Education and Professional Grades" 1833-4. Several important pamphlet publications also addressed these issues and were often taken up in periodical reviews. See Withers 1794, "Observations on Medical Reform, By a Member of the University of Oxford" 1814, Whalley 1816, Marshall 1827, with, for example *EMSJ* 13 (1817): 225-29.

[95] See, for example, Ryan 1830, 43, and for discussion, Crawford 1991, 203.

[96] Useful studies of the role of the medical press in nineteenth-century British reform include Crawford 1991; Loudon and Loudon 1992; Burney 2003; Pladek 2011.

[97] *EMSJ* was published from 1805 to 1855 and continues to the present as *The Edinburgh Medical Journal*; *LMPJ* was published from 1799 to 1833 and continued, under different names, until 1877; *MCT* was published from 1809 to 1907 and continues to the present as *The Journal of the Royal Society of Medicine*.

journals were written principally for general practitioners. That is, the "rhetoric of medicine" examined here is of the sort that Joanna Hartelius has identified as "Language produced by and within a professional discourse community"—and, more specifically, language that is "directed at an audience of peers" (i.e., specialists, experts) as opposed to an "audience of laypersons" (Hartelius 2009, 469 n. 4). In fact, the new medical periodicals helped to form an intellectual and professional community (see Pladek 2011), one that viewed the reform of medical education as crucial to the organization of a disordered discipline and to the improvement of medical practice. Contributions to the debates played out in the periodicals emphasized the need for clearer educational standards in the credentialing of practitioners and suggested measures for the accommodation of new science in a more rigorous and uniform medical curriculum. Arguments for educational and professional reform went hand in hand, and would intensify in the pages of a second wave of periodicals starting in the later 1820s.

The periodicals emerged as an important source of medical knowledge and continuing education for practitioners, especially those general practitioners cut off from the urban centers of London and Edinburgh. In this respect, they are in between theory/practice in terms of the literature, i.e., they speak to both interests, creating a tension in this relationship. Hence, Hans-Georg Gadamer's work in the theory and

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This "first wave" of nineteenth-century British medical periodicals developed upon such eighteenth-century publications as *Medical Essays and Observations* (1731-1746), *Medical Observations and Inquiries* (1754-1784), *Medical and Philosophical Commentaries* (1773-1797), *The London Medical Journal* (1781-1790), and *Medical Facts and Observations* (1791-1800); see Porter 1992b. The "second wave" would include *The Lancet* (1823-), the *London Medical Gazette* (1827-1851), *The Medical Times* (1839-1851), the *London Medical and Surgical Journal* (1828-1837), and the periodicals issued by the Provincial Medical and Surgical Association – *Transactions of the Provincial Medical and Surgical Association* (1832-1853) and *Provincial Medical and Surgical Journal* (1840-1852) – that from 1857 would become the *British Medical Journal.*

practice of medicine proves useful to my analysis of these medical periodicals, and so I devote a section to treatment of his thought. After that, I contextualize the medical periodicals by considering: their editorial statements as well as the institutional and/or private support they received. I then analyze the texts themselves. I consider key statements published during a portion of the respective periodical's tenure to identify four chief rhetorical features of the period: (1) Medical case studies filled many pages in periodicals of the time; although, important to note, these case studies were not well vetted and often represented excitement with experimental science rather than rigorous research. (2) Many of the journals provided an outlet to promote specific educational initiatives in medicine, both inside and outside the university. (3) The medical journalism of the early nineteenth century established a reciprocal relationship between reform in medical education and practice. Through this relationship, medical education reform gains traction with the public. (4) The periodicals provided commentary on institutional patterns in medical education, weighing in on differing disciplinary aims and methods of medical inquiry, and on policy initiatives for education reform and the professionalization of medical practitioners. Finally, I conclude the chapter with discussion of the effort in Britain to establish a broader base of medical educational institutions in order to support the growing emphasis on medical science and the changing definition of the medical practitioner.

History of the Medical Periodical[98]

[98] [Well-respected] medical periodicals consisted of the following: (1) were agents of medical teaching and advances in medical science, (2) communicated results of medical research, (3) acted as a repository of

In the Enlightenment, there was an overarching idea that knowledge should be diffused; in practical terms, for knowledge to progress, publication was necessary. The history of the medical periodical in Britain in the seventeenth and eighteenth century is interesting but complex. "Scientific and medical journals first made their appearance in the latter half of the seventeenth century, and provided a new and revolutionary means of communication. The early journals were of two kinds—the transactions and proceedings of academic bodies, which reproduced the texts of papers delivered at their meetings; and journals published by individuals or societies and containing papers from a variety of sources" (Morton 1990, 221). Change in medical publishing around the late eighteenth century resulted in more diversity, Roy Porter describes this diversity in terms of culture:

> In short, the relations in Georgian England between medical knowledge and medical publishing were not simple. After the lapsing of the Licensing Act in 1695, publishing was a booming business. But a medical world in which aspiring practitioners had to look more to lay patrons than to their peers for name and fame hardly provided the best seedbed for a specialist medical press. Contrast the far more favourable conditions obtaining in the Victorian age: a heightened sense of professional *esprit de corps* and exclusiveness, concentrated in clubs, societies and associations, disciplinary specialization, radical reform campaigns, and all those other features later conspicuous in the pages of *The Lancet* and the *BMJ* [*British Medical Journal*]. (1992, 13)

Medical periodicals were vitally important in presenting "new ideas on medical practice and medical research [and] reflecting and shaping the development of medical education and the medical profession" (Loudon 1992, 66).[99] Although British periodicals published

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reference sources for research work and medical literature, and (4) provided political news mostly related to the rules and regulations of pharmacopœias.

[99] Brock describes three kids of commercial science journals during the nineteenth century in Britain: "[T]hose launched by proprietors as purely financial speculations, to be abandoned immediately [if] their

in the nineteenth century had various support mechanisms ranging from private to institutional funding few survived into the twentieth century (Morton 1990, 226).

Before the advent of scientific and medical periodicals, communication between scientists consisted primarily of private correspondence. Medical periodicals continued to publish correspondence, but they also published scientific papers, medical case studies, editorials, medical politics, reviews, news, obituaries, and notices of lectures and societies. The most successful medical periodicals combined scientific content with a lay magazine format (Loudon 1992, 57). The new medical periodicals began with a statement of their aims. Nearly all stated the aim of improving medical communication amongst practitioners and to promote the "healing art." "The healing art covered both case histories and more fundamental enquiries, often, as in the eighteenth century, taking the form of 'letters' or 'communications'" (Loudon 1992, 56). Additionally, one sees the move to both professionalize medicine and create a more educated medical practitioner through attacks on both quacks and the exclusive London Royal Colleges (Loudon and Loudon 1992, 56). Consider, for example, the following statement of aims from the inaugural issue of the *Edinburgh Medical and Surgical Journal*[100] published in 1805:

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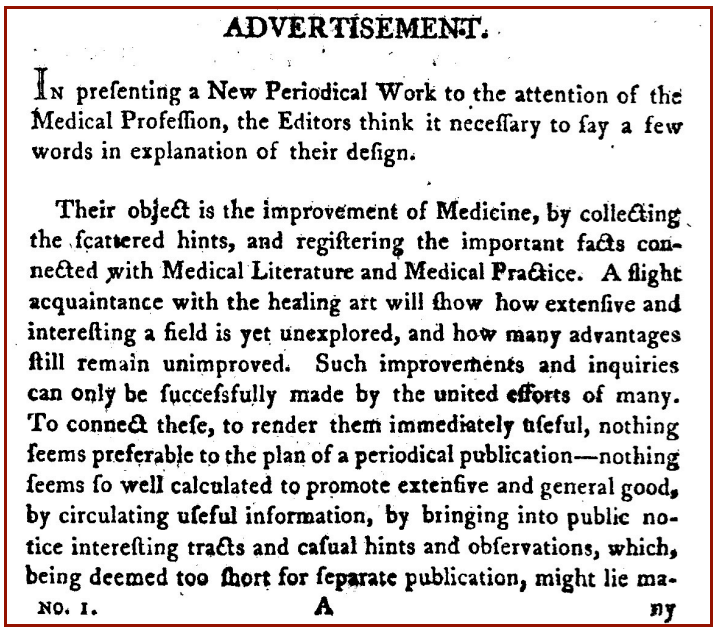
profitability became questionable; those launched altruistically by their owners for the good of science, and supported by the unpaid contributions of readers, the journal being heavily subsidized until either it was solvent or the owner approached bankruptcy; and those launched with genuine desire to further science and to give proprietor, editor and possibly contributors a fair financial return for their time and efforts. … Although there were more society-sponsored journals founded during the nineteenth century, few of them had long lives" (1992, 72).

[100] "One of the finest of all the early journals, the *Edinburgh Medical and Surgical Journal*, was really a house journal, for it was supported by the Edinburgh College of Physicians and its editor, Andrew Duncan junior, professor of the Institutes of Medicine in the University of Edinburgh, was almost the only editor to hold a senior appointment. … House journals possessed the obvious advantage that members of the institution could be counted on to write articles and act as a captive readership willing, and able, to underwrite at least some of the cost of publication" (Loudon and Loudon 1992, 54-5).



ADVERTISEMENT.

In preſenting a New Periodical Work to the attention of the Medical Profeſſion, the Editors think it neceſſary to ſay a few words in explanation of their deſign.

Their object is the improvement of Medicine, by collecting the ſcattered hints, and regiſtering the important facts connected with Medical Literature and Medical Practice. A ſlight acquaintance with the healing art will ſhow how extenſive and intereſting a field is yet unexplored, and how many advantages ſtill remain unimproved. Such improvements and inquiries can only be ſucceſsfully made by the united efforts of many. To connect theſe, to render them immediately uſeful, nothing ſeems preferable to the plan of a periodical publication—nothing ſeems ſo well calculated to promote extenſive and general good, by circulating uſeful information, by bringing into public notice intereſting tracts and caſual hints and obſervations, which, being deemed too ſhort for ſeparate publication, might lie ma-

No. I. A ny

Figure 4.1: *EMSJ* Advertisement 1805

This six-page "advertisement" standing at the beginning of the issue continues, "A New Work of this kind, therefore, if properly conducted, cannot fail to be favourable to the best interests of Medical Science. … while at the same time an opportunity will be afforded to all who are actuated by a zeal for the diffusion of knowledge … and to add to the general stock of Medical information" (1805, 2-3).

Many new perspectives were brought to the pages of medical periodicals in the early nineteenth century. They captured something important about the changes taking place in medical education and the desire for its reform. They served as a vital source of medical knowledge to provincial surgeon-apothecaries and the emerging general practitioners; additionally, the medical periodicals expressed institutional criticismand influenced policy, and explored medical theory and practice.

The Loudons suggest "much of the [medical reform] strife was mediated through the columns of the medical periodicals which are almost the only source of what happened in the period of medical reform" (1992, 65). Given this function of medical periodicals, they reflect an important judgment on the transformation of British medical education during the early decades the nineteenth century. In comparison to the general periodical press, medical periodicals tended to be more polite and dispassionate. The *London Medical and Physical Journal* had a detached analytical approach, the *Edinburgh Medical and Surgical Journal* was "studious and gentlemanly," and the *Medico-Chirurgical Transactions* "stood out for the high scientific quality of its papers related to medical practice" (Loudan 1992, 61-2). The roles of these three medical periodicals varied, but they all represent an important account of the state of medicine at this time.

The *Edinburgh Medical and Surgical Journal* (*EMSJ*) was published quarterly. This journal had a genealogy dating back through the eighteenth century. *Medical Essays and Observations* (six volumes ending in 1731) was the first medical journal published in Scotland and an ancestor of the *EMSJ*. The next journals in line were *Essays and Observations*, *Physical and Literary*, Edinburgh, 1754-65 and *Medical and Philosophical Commentaries*, *by a Society in Edinburgh* vols 1-6, 1774-9, continued as *Medical Commentaries*, 1780-1804, continued as *Annals of Medicine*, 1794-1804. Finally, the journal emerged as the *Edinburgh Medical and Surgical Journal of Medical Science* in 1805 (Morton 1990, 227-8). The *London Medical and Physical Journal* (*LMPJ*) was published monthly from 1799-1833 as a private medical venture. Richard Phillips, who also had influence on policy, owned this publication. "Phillips encouraged medical

reform, was antagonistic towards the Royal Colleges in London, and thus supported the emerging general practitioners" (Loudon 1992, 57). The Royal Medico-Chirurgical Society of London (established in 1805) began its quarterly publication of *Medico-Chirurgical Transactions* (*MCT*) in 1809. This society of London was founded on a commitment to the merger of medicine and surgery and continued to publish periodical content until 1907.

Medical Periodicals as Source of Medical Knowledge for Practitioners

In some way, each periodical felt compelled to disseminate knowledge to medical practitioners in Britain. For example, many of the provincial medical practitioners in Britain were cut off from the urban centers of learning; thus, the medical periodicals were an important source of scientific knowledge for them. In more explicit references to the aims of their respective medical periodical, the *EMJS*, *LMPJ*, and *MCT* each treat their purposes as centered on specific goals. The *EMJS* identifies *utility* as its primary aim; the *LMPJ* identifies *pedagogy* as central to its purpose; *MCT* identifies *improvement and practical knowledge* as its emphasis. The respective self-characterizations are noteworthy in relation to the shifts in medical education taking place in the early nineteenth century.

EMJS associates the function of medical periodicals with a very specific definition of utility related to medical knowledge. "[T]he principal object of the Editors is utility; and they do not conceive that their exertions can be more usefully employed, than in giving an early and summary account of the publications connected with Medicine"

(*EMJS* 1805, 5). To ensure the principle object of utility, the inaugural editorial statement carefully outlines its vetting process for the journal's content.

> In selecting a part for detailed analysis, the Editors will be chiefly regulated by the importance of the subject, the excellence of the manner in which it is treated and the rarity or expence [sic] of the work; and it is their wish rather to bring into notice real improvements, and to encourage dissident abilities, than to discover imperfections, and to expose errors. These, however, when sanctioned by high authority, and advanced with imposing confidence, it is the duty of the Editors to supply or correct; and, by thus combining judicious analysis with independent criticism, they hope to be able to render this department of their undertaking frequently interesting and original, always useful and instructive. (1805, 5)

By appropriating their purpose in terms of utility, the editors of *EMJS* claim their place in the contemporary medical periodical literature. With utility as the contextual aim, *EMJS* also underscores related initiatives: rarity and novelty of selected content, encouragement of dissident abilities, emphasis on significant improvements in medicine, and judicious analysis with independent criticism. Given this editorial direction, *EMJS* then outlines the content organization of each journal. Each quarterly publication was divided into three sections: "Original Communications," "Critical Analysis of Medical Publications," and "Miscellaneous Intelligence on Medical Subjects." The "Original Communications" section was composed of content related to a sampling of these subject areas: medical and surgical histories and reflections, anatomy, physiology, pathology, natural history, chemistry, causes and treatments of disease, philosophy of medicine, disease as the object of rational inquiry, the application of the science of medicine to public health, and pharmacy. The "Critical Analysis of Medical Publications" treated content in these areas: recent medical publications both foreign and domestic and the promotion of medical

science. Finally, "Miscellaneous Intelligence on Medical Subjects" would consist of medical news, correspondence and extracts.

The *LMPJ*'s editorial aim was centered on pedagogy. The editors proposed two objects for their journal. The first object was to render the journal a "respectable vehicle for those discoveries, improvements, and medical cases" that without such a publishing opportunity would "be consigned to oblivion" (1799, preface). The second object was to "collect and condense" the improvements in medicine coming out of Europe in order to accommodate the practitioners that could not afford to buy the "voluminous and expensive works" in which they were published. These stated aims were educational in nature. *LMPJ* was published in London, which did not have a medical school affiliated with a university; rather, apprenticeship, private lectures and the hope of working at a hospital were the outlets for an aspiring surgeon-apothecary or general practitioner. *LMPJ*'s efforts arose in a specific medical climate in London to which they responded; a climate shifting to the surgeon-apothecary's and emerging general practitioner's desire for recognition in the practice of physic. As such, the journal captured the spirit of instruction:

> Whether these two objects, so essentially involving the merits, as well as the success of the present undertaking, have in sufficient degree been attained, we submit to the decision of the candid and unprejudiced reader … [T]he conductors believe that their publication has had the merit of exciting of the student, and a general spirit of investigation … and at the same time it has been the means of diffusing no little variety of instructive and valuable information. And as it is the primary object of a periodical work, that it should become a center of communication, the conductors congratulate themselves on the very flattering and unexampled testimonies of favour they have received, by the regular and abundant supply of original articles, equally instructive and valuable. (1799, preface).

The effort to focus the journal on valuable instruction is evidenced in the passage above. By submitting the decision of success to the "candid and unprejudiced reader," the editors of the journal set up a relationship between themselves and their readers that was instructional. In this respect, their two editorial objects can be characterized as pedagogical with a stated ambition to "excit[e] … the student."

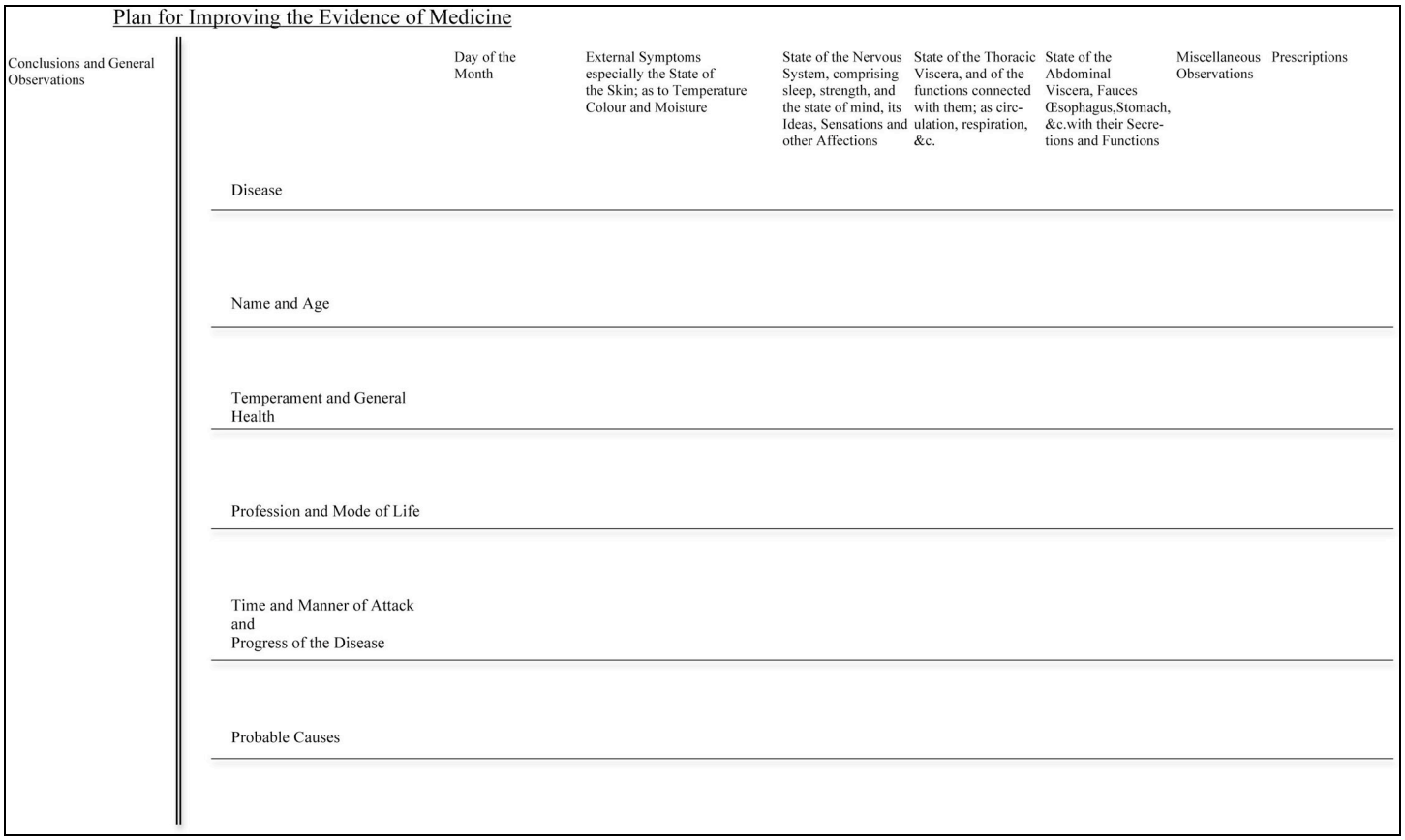
The *MCT* characterized their publication under the auspices of improvement and the "interchange of practical knowledge." The first published volume consisted of papers composed and read at meetings of the Royal Medico-Chirurgical Society of London. The hope of the Society for this periodical was that the medical public would "support [its] claim of respectability and usefulness" to medical science and practice (1809, preface vi). Indeed, practical knowledge was a virtue to which the editors aspired:

> 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. … Researches in anatomy, physiology, and that part of chemistry which is immediately connected with some of the branches of medicine, are also considered appropriate objects of communication. … The reading of such communications as are presented to the Society, forms one part of its ordinary business. The interchange of practical knowledge … affords a greater facility of obtaining accurate information on many points of practice, than could have been derived from a Society, composed of either Surgeons or physicians alone. … [Furthermore] it does not at all enter into the plan of this institution, to suffer its proceedings to assume the form of debate or disputation. (1809, preface vii-x)

The Society's practical attitude toward the purpose of medical periodicals was expressed in their desire for publishing subjects of high interest and those considered appropriate to medicine. The wish to avoid debate and dispute echoes the desire of the Society to come

across as "gentlemanly." As such, *MCT* did not include content other than medical case studies and the occasional editorial statement. Moreover, as surgery and physic merged in practice, both the Society and its associated periodical, *MCT*, focused on the role of surgery as a key element in medical education.

One can most easily understand the role of nineteenth-century medical periodicals as an important source of knowledge for the medical public by examining the ways in which information was disseminated to medical practitioners through their content. The periodicals defined themselves as a source to improve the science of medicine and streamlined contemporary medical science findings, debates, and practical medical advice for their readers. One such example of providing not only a useful hermeneutic for medical practitioners, but also a tool that endorsed the use of physical evidence for disease patterns is found in the 1811 volume of *EMSJ*, titled "Plan for Improving the Evidence of Medicine."



Plan for Improving the Evidence of Medicine

Conclusions and General Observations		Day of the Month	External Symptoms especially the State of the Skin; as to Temperature Colour and Moisture	State of the Nervous System, comprising sleep, strength, and the state of mind, its Ideas, Sensations and other Affections	State of the Thoracic Viscera, and of the functions connected with them; as circulation, respiration, &c.	State of the Abdominal Viscera, Fauces Œsophagus,Stomach, &c.with their Secretions and Functions	Miscellaneous Observations	Prescriptions
	Disease							
	Name and Age							
	Temperament and General Health							
	Profession and Mode of Life							
	Time and Manner of Attack and Progress of the Disease							
	Probable Causes							

Figure 4.2: Plan for Improving Evidence in Medicine "This schedule for facilitating an arranged record of medical observations appears to be so well adapted to the purpose for which it is intended, that we think its general adoption would be attended with important consequences. It may be printed on a larger or smaller sheet, according to the hand-writing of the person for whose use it is designed; but, in general, the size of a foolscap folio, or post quarto, will be found most convenient" (*EMSJ* 1811, 251-2).

This evidence table asks the practitioner to record details of a patient's disease and what were perceived by medical science at the time as related physiological details. The practitioner should record details such as external symptoms, state of the nervous system, state of the thoracic viscera, state of the abdominal functions, and any other miscellaneous observations. From the standpoint of contemporary medical science, an "arranged record of medical observations" in a standard format would be, with large-scale adoption, "attended with important consequence." This plan for improving evidence in medicine offers a hermeneutic for medical practitioners. This is a telling case of what Gadamer deems a problematic between theory and practice in medicine. In other words, the practitioner is "limited to what [he] must answer by [the structural element of his] questions." This hermeneutic structure modifies practice insofar as the "practical knowledge of human beings themselves becomes the object of science" (Gadamer 1996, 28). Tracking evidence in bedside encounters organizes or "systematizes" the dynamic between practitioner and patient. The patient's disease is normatively determined by the appropriate physiological focus, and the physiological theories on which the practitioner should focus are determined by the hermeneutic structure. In short, this approach to disease leaves room for the practitioner's therapeutic choices, but it dictates the frame through which the disease is to be examined.

In 1805, the *LMPJ* published an anti-quack essay, "On the Publication of Medical Cases," in which the claim was made that medical cases have "prevented the ignorant and illiberal mind from taking shelter under the recovery of the patient, as done daily by the Quack and Charlatan" (207). The author recognizes that medicine's historical orientation

toward the "case" has "brought the healing art to its present perfection" (207). Without this genre, medicine would be infiltrated by quacks. This grounds practice in medical theory. With the proliferation of medical periodicals, the medical case was broadly disseminated and generalized for instructive purposes and used as a tool to treat patients. The medical case could facilitate the teaching of medicine by offering an important commentary on successes and failures in medicine and by identifying "best practices."

Although all three of these medical periodicals predominantly published medical cases, *MCT* published nothing else. The medical case directs the practitioner to generalizable patterns in disease through the use of individualized narrative accounts. Though etiology was not advanced in medicine, practitioners attempted to reason from symptoms in order to intuit nosological patterns that could be applied more generally to medical practice. Although hardly conclusive, the practice of engaging with the patient in this manner allowed the practitioner to use a patient narrative to elucidate contemporary theories of medicine, though not always successfully.

Reference to a sample from the 1813 issue of *MCT* allows one to see the instructive nature of the medical case in nineteenth-century medical periodicals. In the "Case of Paralysis of the Face, Succeeded by Certain Nervous Disorders," submitted by Dr. Edward Percival to the Medico-Chirurgical Society, classification of symptoms in a female patient points to "some views of pathology, which are not wholly uninteresting nor uninstructive" (*MCT* 1813, 17).

> The following case is submitted to the attention of the Society, as exhibiting a singular and connected series of nervous diseases, which occurred in a young woman and hitherto healthy female. Each disorder, or class of symptoms, taken separately, is by no means of rare occurrence;

> but their regular sequence, each distinctly lapsing into the other, together with a community, in a considerable degree, of cure throughout, seem to point to some views on pathology. … thus reducing the three successive disorders to the same class of *nervous* derangements, I presume only to conjecture. The narrative of facts is authentic. (*MCT* 1813, 17, 24)

The doctor's "views on pathology" are never clarified in this medical case. The reader must rely upon his own expertise in order to analyze the narrative facts of this case. In the contemporary medical context, the doctor's self-proclaimed "authentic" "narrative of facts" reveals an implicit desire to grasp the "facts" of a particular case in relation to broader classifications of disease. This approach to similarly published medical cases was characteristic throughout the pages of *MCT*.[101] The direct links between a patient's symptoms and the definitive classification of disease were not always sufficiently connected. Most important to consider, is the desire to place the medical case in the emerging scientific systems of medicine, asserting the ties between medical practice and medical science. The medical case, the staple of the medical periodical in this period, is undoubtedly both representative and a force behind these developments in medicine.

I have tried to put the medical case found in these medical periodicals in perspective by noting that the development of this form of knowledge dissemination was relevant to broader shifts in scientific medicine. Hints of the patient becoming the object of science through the generalization of disease patterns can be found throughout the cases in these periodicals. As scientific medicine develops in the early nineteenth century, its "capacity for objectification [becomes] fundamental to the acquisition of knowledge"

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[101] "An Account of a Peculiar Disease of the Heart" *MCT* 1809, "A Case of Exposure to the Vapour of Burning Coal" *MCT* 1809, "A Case of Secondary Small Pox, with References of Some Cases of a Similar Nature." *MCT* 1811, "Facts and Observations Respecting Intermittent Fevers, and the Exhalations which Occasion Them." *MCT* 1812, and "Observations and Cases Relating to the Operation for Artificial Pupil" *MCT* 1816.

in order to educate the medical public about broader disease patterns (Gadamer 1996, 22). The preservation of the medical case in a permanent record such as the medical periodical facilitated the cataloguing of practitioners' observations with the goal of systematizing patient treatment. The core of cases and clinical materials in these periodicals engendered a new method of consuming scientific medicine. "With its linear narrative arrangement of information, the case history was the medium through which a physician's observations could be communicated to his colleagues and to medical students" (Berkenkotter 2008, 18). The organization of medical cases in periodicals such as *MCT* provided a rich catalogue to which general practitioners and students—eager to learn broad similarities and categories of patient care—could refer.

The Medical Periodical and Medical Education Inside and Outside the Universities

The medical periodical endorsed an emerging view that medical education should be more scientific. At more progressive British medical schools (particularly Edinburgh), medicine was considered scientifically taught if schools had separated both surgery and physiology from anatomy. This separation was evident in the courses and lectures offered to students that no longer lumped anatomy into a single subject (see Chapters Two and Three). In the early 1800s, particularly in London, the shift in medical education was being driven by private courses outside the universities. Indeed, the University of London (University College Hospital) would not open until 1828.[102] Although science was not

[102] See Newman 1957: "The original founders of University College had the notion of medical education specifically in their minds when they were considering a non-sectarian university … [they wanted] to set up an institution for the advancement of Literature and Science for young men … residing in … the component districts of London" (113).

therapeutically useful at this time, the medical periodicals were a constant reminder of an emphasis on new scientific considerations in medical education and practice. Charles Newman elaborates that medical education interests became oriented toward scientific subjects:

> Despite the advantages of a classical education, it was inevitable that it should be abandoned in practice. As the science of medicine progressed, there grew a larger and larger body of technology for the student to learn, and whether it was applicable to medicine or not, it appeared more closely related to it than the literary subjects. And the utilitarian age was bound to react against the tradition of the humanities in favour of the application of 'useful knowledge'. Moreover, a more and more progressively materialistic outlook was bound to affect that aim which educational reformers set before themselves as the object of their reforms: they saw, rightly, that doctors must acquire knowledge which put into their hands new power to treat their patients effectively and to prosecute further investigations which would continue to increase that power. (1957, 54-55)

Intellectual shifts in medical education turned pedagogical interests toward scientific disciplines, and the medical periodicals encouraged this commitment. "Knowledge useful for practice took precedence over the acquisition of method of thought and the ability to learn" (Poynter 1966, 159). Though growth in science in medical education did not produce certainty in medicine immediately, it shifted the pedagogical emphasis. The aim, then, of the medical periodicals was to place medicine within this framework.

Beginning with its 1810 volume, *EMSJ* excerpts portions of *MCT*, continuing this practice going forward. Of particular interest is that Edinburgh considered London's *MCT* of enough scientific value to regularly include excerpts in its volumes. Sourcing scientific medical knowledge was characteristic of medical periodicals. Not only did medical case studies fill the pages of periodicals, but also key medical commentary or source material marked to be of pertinence to the medical practitioner. In this regard,

then, medical periodicals were a vital catalogue of current medical knowledge. And, of course, educational ambitions were treated in their pages. Many of these sources revealed greater awareness that science was becoming a key priority in medical education.

One such understanding or awareness is seen in *EMSJ* on the issue of consistent scientific nomenclature in medicine. A contribution to the 1811 volume titled "Remarks on the Nomenclature of the New London Pharmacopœia" advocated uniformity in the profession. "Many of [the differences in nomenclature] originate in error in one or both of the royal colleges, and will be removed as their members become better informed or progress of science advances. … A principle which has been sanctioned by the adoption of any one of the [royal] colleges should always be adopted by the other, unless another, obviously and greatly preferable, should be substituted in its place" (368). In this commentary, the author acknowledges that "absolute uniformity" will probably not be attained, but "these changes, if not arbitrary, are all advances toward permanency" (369). It seems reasonable to interpret this description of a uniform nomenclature, although dependent on institutional adoption, as a claim to the link between science and medical education. The application of a uniform nomenclature to achieve consistency and permanency makes clear the connection between science and the desire to increase its pedagogical use. Put differently, the desire was to achieve consistency in the scientific language used to teach medicine, i.e., what is taught as valid nomenclature in Edinburgh is taught the same way in London. This begins to lay the groundwork for later medical education reform that seeks to establish consistent medical education requirements for practitioners across Britain.

Another notable publication in the 1809 volume of *EMSJ* was "Regulations to be observed by Candidates, Previous to Their being taken upon Trials for obtaining Diplomas from the Royal College of Surgeons, Edinburgh." Medical publishing that outlined improvements in educational standards for medical students sought to establish a link between stricter degree requirements and safer care for patients. "In enacting and publishing the following Regulations, respecting the course of study to be followed by Candidates for Surgical Diplomas, the Royal College of Surgeons of Edinburgh are anxious to evince to the public how desirous they are of adopting … such measures as appear to them to be calculated to improve the education of those who are hereafter to have the care of … their fellow citizens" (387). The basis of these regulations was not only to direct students in their studies, but also to emphasize a strong conviction that this was necessary for the public good.

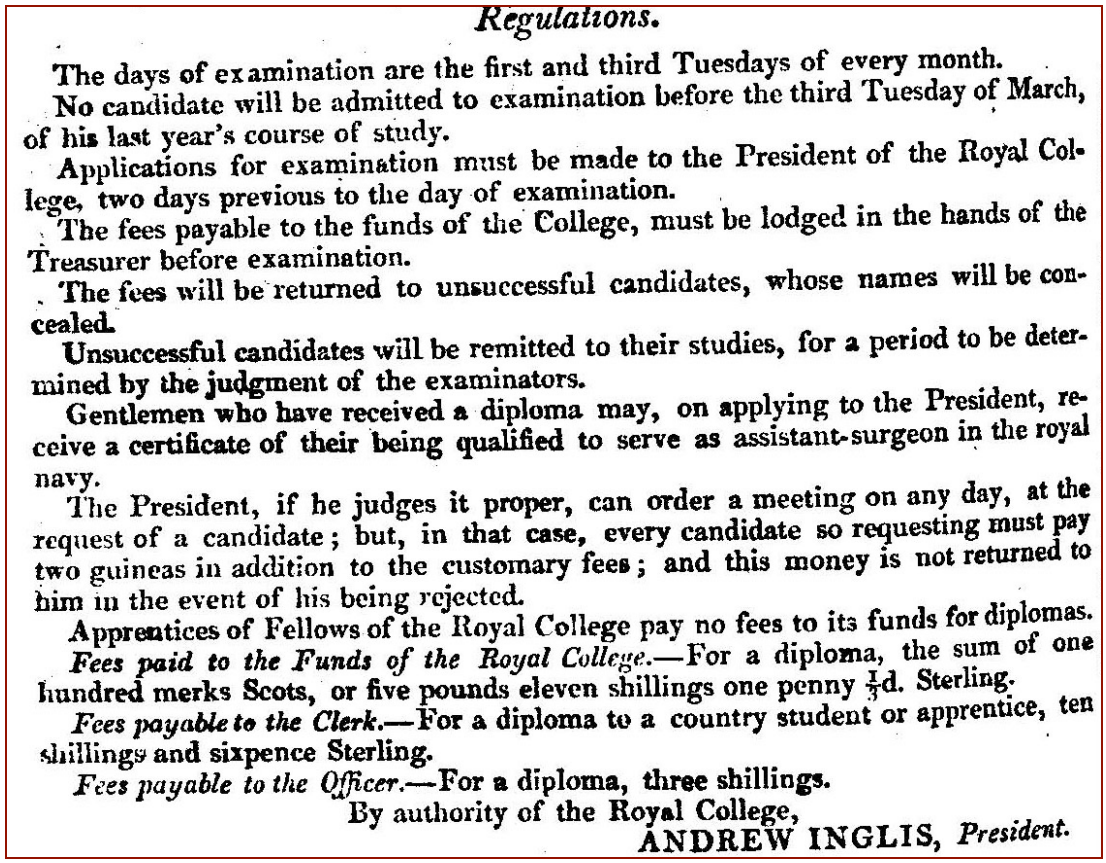
> The Royal College [of Surgeons] … will prevent any candidate from offering himself for examination unless he has made himself acquainted with the principles of his profession; and, on this account have now given orders to have them published … [to direct] young men who are educating to the profession of Surgery, may be apprised of the extent of the course of study requisite to be pursued … and [can] direct the education of [them] according to a systematic plan; and likewise for the satisfaction of the public at large. (387)

The significance of these regulations was further enhanced by the stipulation that candidates for surgical diplomas must study at "some university of reputation, or under teachers who are members of the Colleges of Physicians or Surgeons of London, Dublin, or Edinburgh" (387). In sharp contrast to the history of surgery as an art learned through apprenticeship under the tutelage of a lay surgeon, the universities had adopted surgery under their auspices as a scientific enhancement to medical education. Hands-on training

was still necessary for the surgeon, but increasingly, the endorsed or legitimate path for surgeons was a university education. The integration of surgery into the medical curriculum of universities was also a strategic move to enable the education centers and university-trained physicians to maintain control over the course of the practice of physic—not allowing it to be dominated by another of the orders, apothecaries or surgeons.[103]

The following figure details the regulations outlined by the Royal College.

[103] "[A]ttempting to gauge with exactitude the extent to which nineteenth-century physicians were, by present standards, scientific, proves an unproductive task. Patients judged the profession by the criteria of their age, an authority which was incapable of distinguishing in any absolute sense the relative scientific merit of, for example, a phrenologist or his opponent. Given this limitation, 'valid' science becomes irrelevant to the attainment of status, while to pursue diligently its antecedents adds little to an understanding of the past. What is of paramount importance, however, is the manner in which physicians used, not the content, but the rhetoric of science. In an analysis of the deployment of science by physicians it will become apparent that the nineteenth-century profession, though outwardly demonstrating increasing homogeneity, must be resolved into a series of distinct and frequently competing subgroups. Each of these fragments invoked a definition of biomedical knowledge designed to accord with its particular aspirations. In effect, science, mirroring the profession itself, must be seen not as a fixed entity but as a collage of discrete and malleable constituents" (Shortt 1983, 60).



Regulations.

The days of examination are the first and third Tuesdays of every month.

No candidate will be admitted to examination before the third Tuesday of March, of his last year's course of study.

Applications for examination must be made to the President of the Royal College, two days previous to the day of examination.

The fees payable to the funds of the College, must be lodged in the hands of the Treasurer before examination.

The fees will be returned to unsuccessful candidates, whose names will be concealed.

Unsuccessful candidates will be remitted to their studies, for a period to be determined by the judgment of the examinators.

Gentlemen who have received a diploma may, on applying to the President, receive a certificate of their being qualified to serve as assistant-surgeon in the royal navy.

The President, if he judges it proper, can order a meeting on any day, at the request of a candidate; but, in that case, every candidate so requesting must pay two guineas in addition to the customary fees; and this money is not returned to him in the event of his being rejected.

Apprentices of Fellows of the Royal College pay no fees to its funds for diplomas.

Fees paid to the Funds of the Royal College.—For a diploma, the sum of one hundred merks Scots, or five pounds eleven shillings one penny $\frac{1}{3}$d. Sterling.

Fees payable to the Clerk.—For a diploma to a country student or apprentice, ten shillings and sixpence Sterling.

Fees payable to the Officer.—For a diploma, three shillings.

By authority of the Royal College,

ANDREW INGLIS, *President.*

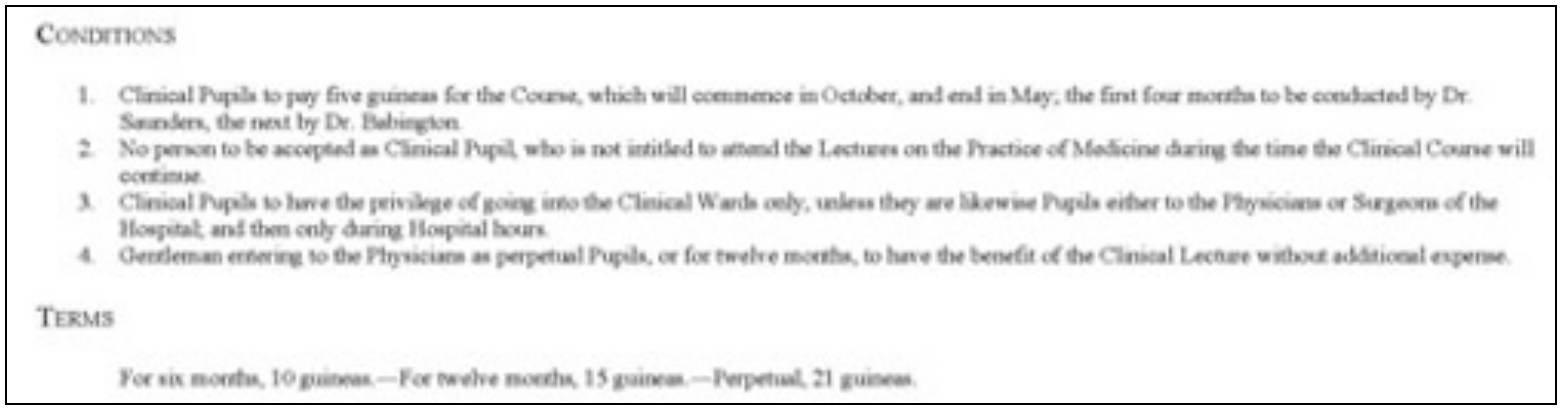
Figure 4.3: Regulations for Medical Education by RCP (*EMJS* 1809, 388).

In addition to publishing educational regulations, the medical periodicals also published a list of public and private lectures. *LMPJ* was particularly keen on doing this, as there was not an established medical school in London. Private medical lectures were well-known by aspiring practitioners in London and elsewhere, but the *LMPJ* offered a venue to advertise them. In the 1804 volume of *LMPJ*, it states: "We have authority to announce the following Medical Lectures, [which] … will commence at these united Hospitals in the following order" (280). Reputable surgeons or physicians in the theaters of London hospitals such as St. Thomas and Guys gave most of the lectures. The topics consisted of subjects endorsed by established universities, such as the medical school at Edinburgh: Theory and Practice of Medicine (Dr. Babington), Chemistry and

Experimental Philosophy (Drs. Lowder and Haighton), Physiology or Laws of the Animal Economy (Rev. Mr. Roberts and Dr. Babington), and Materia Medica (Dr. Haighton (*LMPJ* 1800, 280). The announcement insisted, "the most interesting Cases will be selected from among the whole number of Medical Patients admitted to the Hospital. … Every Thursday evening, at eight o'clock, a Lecture will be delivered upon the most important cases; in which the symptoms of each will be examined, the leading and essential ones pointed out, and the disease referred to its proper place in the best Systems of Nosology"[104] (*LMPJ* 1800, 281).Outlined below are the strict conditions and terms the hospitals maintained for the attendees.[105]

[104] Incidentally, in the same volume of LMPJ, William Cullen's system of nosology is endorsed as a "comprehensive compilation … considered as a Medical Library for young students; and we think it may, for some time, supercede the necessity of any other" (*LMPJ* 1800, 262).

[105] Susan Lawrence's book-length examination of London Hospitals in the eighteenth century provides helpful context (see more in Chapter Two). "Teaching, especially public hospital teaching, was central to the construction of hospital knowledge. Hospitals had been used for training medical men ever since London surgeons took their apprentices with them into wards … Ward teaching changed dramatically in the eighteenth century, however, when the pupils who entered London hospitals ceased needing personal connections to hospital staff and instead paid to spend a few months or a year walking through the wards" (1996, 25-7).



CONDITIONS

1. Clinical Pupils to pay five guineas for the Course, which will commence in October, and end in May; the first four months to be conducted by Dr. Saunders, the next by Dr. Babington.
2. No person to be accepted as Clinical Pupil, who is not intitled to attend the Lectures on the Practice of Medicine during the time the Clinical Course will continue.
3. Clinical Pupils to have the privilege of going into the Clinical Wards only, unless they are likewise Pupils either to the Physicians or Surgeons of the Hospital; and then only during Hospital hours.
4. Gentleman entering to the Physicians as perpetual Pupils, or for twelve months, to have the benefit of the Clinical Lecture without additional expense.

TERMS

For six months, 10 guineas.—For twelve months, 15 guineas.—Perpetual, 21 guineas.

Figure 4.4: Conditions for Clinical Pupils (*LMPJ* 1800, 281-2).

The courses were designed with the object to "unite Theory and Practice, to verify general precepts by individual examples, and thereby give a connected and systematic view of the History, Nature, Causes, and Cure of Disease" (*LMPJ* 1800, 281). Particularly notable, the description of the plan for the clinical lectures distinguishes individual examples from general precepts. These clinical lectures supplied a more prescribed structure for teachers who sought to achieve an overall consistency or rubric within which to identify and comment on individual patient cases. In other words, the patient experience was used to verify a general, systematic view of disease in medical education. As Gadamer points out, there is an important distinction to be made between the practice (art) of medicine and the theories to which medicine subscribes. The practice or art of medicine requires skilled judgment applied in particular cases in contrast to general knowledge produced by the emerging theories of scientific medicine, which were meant to provide general rules for teaching and learning.

Medical Education and Medical Practice in the Periodicals

Talk of medical education reform began early in the nineteenth century. Much of the debate centered on the role of the Royal Colleges in London to regulate and license physicians to practice. The tripartite division of the medical profession was being blurred, and the rise of the surgeon-apothecary and the general practitioner could no longer be ignored. The Colleges were fighting to maintain their control of the practice of physic. Hence, medical reform was a professional campaign, not a popular movement (Newman 1966, 62). In the early nineteenth century the hospital and university were not integrated

as they are today. Edinburgh was progressive in its use of clinical teaching at the Royal Infirmary; however, in London, there was not an established university, so the charitable hospitals offered practical education.[106] The medical periodicals were the main source of public discussion about the merits of medical education reform in Britain. In a sense, the periodicals were the platform for each side to make their case. Often, the periodical itself would be associated with one side or the other of the educational reform movement.

A large portion of the public in the early nineteenth century relied on apothecaries, surgeons, and the general practitioner for their care.[107] So, the idea of reforming medical education to be more aligned with science had to be sold to the public as a worthy goal—a way to ensure that one's practitioner was "safe." If the lay practitioner's knowledge could be rendered illegitimate, then the regulated practitioner would gain the public's support. Medical reform was a layered issue: (1) the more progressive schools such as Edinburgh were fighting the Royal College of Physicians on the idea that only an Oxford and Cambridge degree constituted a valid education, and (2) the tripartite divisions in medicine were eroding, so the only way to claim territory over

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[106] Newman clarifies: "It is to be noted that contemporary opinion distinguished automatically between a medical school and a hospital: the two things were still quite different, one providing academic and the other practical teaching, with no connexion between the two. It is also to be noted that there was a footnote to the Abstract of the bill, as printed in 1810, which observed that 'sufficient Medical Education ought in every instance to be a title of practice'. The agitation for the Apothecaries' Act was essentially an educational movement" (1957, 66-7).

[107] Loudon authored a book-length study on medical care and the general practitioner in Britain between 1750-1850. "[T]here are two major difficulties in attempting a coherent picture of ordinary medical practice in the eighteenth century [and turn of the nineteenth century]. First, there is the diversity of medical men, and second, the absence of a clear distinction between the orthodox or regular practitioner and the unorthodox irregular or quack. … The 'grey area' of uncertainty is brought out by examples such as medical men who started as grocers, selling drugs as a sideline, who simply changed the board over their door to 'surgeon' or 'apothecary' if it suited them to do so. … Orthodox medicine before 1850 fell into four well-know categories of physic, surgery, pharmacy, and midwifery. Only from the mid-nineteenth century was there … an increasing multiplication of specialties" (1986, 13, 18-19).

lay practitioners was to require a state-sanctioned, regulated medical education. The shift in Britain in the early nineteenth century was compelling insofar as it was located in the fight between universities, the Royal Colleges, lay versus educated practitioners, and finally, the investment of the public in reform. Medical education based on emerging science was a means to wedge apart these disparate loyalties and center the debate on an existing educational framework that recent scientific advances would improve. If the lay medical practitioner was delegitimized by the integration of science into medical education, and progressive models of scientific medical education (such as Edinburgh) invalidated the Royal Colleges' control, then medical education and its institutions would be changed. The pages of the medical periodicals presented several voices in the debates.

The 1806 volume of *EMSJ* published a debate on medical reform that was driven by Edinburgh's skepticism of the Royal College of Physician's control of the practice of physic and related education reform. *EMSJ* justified its publication of the debate because the Royal College of Physicians had repeatedly published an advertisement in the London newspapers calling for their sole regulation of the practice of physic. The *EMSJ* published it in the "Medical Intelligence" section of their journal, stating, "it's immediately affecting the interests of the whole Medical Profession, it merits a conspicuous situation in this department of our Journal" (1806, 487).

> Highly as we esteem the talents of the Fellows of London College … we must candidly confess, that to us the object and tendency of this act of their corporation, are not very apparent. Complaints have been made of the number of irregular practitioners in medicine throughout England, and the Royal College feel it their duty to apprize the public that *all* practitioners, who have not been licensed by them, except the graduates of Oxford and Cambridge, are irregular, and exercise their profession in defiance of the laws of the land … we have very great doubts, indeed,

> whether, in law, they are legally intitled to designate all other physicians as irregular practitioners. (*EMSJ* 1806, 487-8).

From the perspective of Edinburgh, the commentary apprises where the Royal College of London has overstepped its bounds. One important issue brought out in this text: the idea of what constitutes an "irregular" practitioner in Britain. Confronting this issue specifically, *EMSJ* interrogates the notion of what type of education qualifies or does not qualify a medical practitioner. Clearly, *EMSJ* is invested in laying claim to Edinburgh's place in the medical profession writ large.

Debate over the definition of "regular" practitioner filled the pages of the medical periodicals of the early nineteenth century. In large measure, medical education reform grew out of this debate and continued to echo the language that science in medical education would guard against "irregular" practice. The concept of an "irregular" practitioner is contained in the periodicals' campaigns against quackery. Expanding on the notion of quackery, the *LMPJ* published a letter to the editor on the subject of quackery in its inaugural volume. "The plan for erecting a public board for the examination of every new medicine is undoubtedly judicious, and, if properly executed, might contribute, in a considerable degree, to the prevention of at least part of the mischief to be dreaded as the consequence of the unlimited indulgence which is at present afforded." A proper "man of science" was invoked as the alternative to quackery: "the value of a medicine compounded under the direction of a man of science, must differ widely from that … put together in an unskillful manner" (1799, 275). The efficacy of a medicine depends on the training of the compounder. The public should be skeptical of a

medicine that was not compounded under the direction of science. Rather, scientific training accomplishes the task of protecting the patient from an unskilled quack. In fact, this should be understood as a difference in kind between regulated medicines based on science and novice unscientific practice.

Taking this a step further, in 1814 *EMSJ* published an essay "On the Qualifications of Surgeon-Apothecaries"—the general practitioner equivalent. While the physicians were protecting themselves against the encroachment of surgeon-apothecaries, the apothecaries were also protecting themselves against chemists that were slowly taking over the compounding of medicines. The essay connects the state of apothecaries to the "odious and pernicious system," which allows oversupply of medicine and the subsequent "disrepute of apothecaries" who were accused of over dispensing it. "[P]eople find it now much more economical to employ a physician, and send his prescriptions to the chemist, than to send for the apothecary. … [Furthermore] it is intended that medical practitioners should have certain legal claim; of course, then, the rate [of medicine] must be fixed" (*EMSJ* 1814, 179-80). In other words, confidence can be produced by relying on the instruction of a learned physician—a man of science:

> But, unless there be a law prohibiting any one to practise medicine or surgery but those who are declared qualified, after being examined by a board appointed for that purpose … they will not raise the profession to that rank in society, which, as guardians of the public health, they ought to enjoy. This calls loudly and imperiously for legislative authority, and, till that be afforded, empiricism will triumph,--science will be depreciated. (180)

Even though this is not a direct controversy about medical education reform, it is an excellent example of how the medical periodicals generated the terms of the debate. By

pitting empiricism against science, the essay offered reformers concepts and language to advance science in medical education and practice. Science, it claims, is required for the safe practice of medicine. Throughout this essay and other similarly minded content in the contemporary periodicals, science is viewed as working as a close ally to medical education reform and key to successful care of the public.

Commentary on Institutional Patterns in Medical Education and Practice

Contemporary medical periodicals provided commentary on institutional patterns in medical education. One can identify a rudimentary structure to the commentary; it focused on disciplinary aims, methods of inquiry in medicine, and medical education policy initiatives. What is apparent in this structure is that all of these foci are closely tied to the reform movement that plays out in the early decades of the nineteenth century in Britain. Among these foci, the notion of scientific medical education realizing its ambitions within an educational framework forms a bridge between them. In the pages of the medical periodicals, medical education and practice are transformed by science, institutionalized in a changing educational framework.

To accomplish the emerging disciplinary aims of scientific medicine, the medical student had to master generalized knowledge about disease within a fairly prescribed institutional framework.[108] With this structure in mind, a notable feature of medical

[108] "The key shift into the eighteenth century seems closely related to consistent educational provision for medical professionalism on a broader scale. Where learning was earlier an attribute of social class and competence or the result of corporate regulation, the image of a modern medical professional could, after the Enlightenment, be distinguished through degree programmes. Education defined parameters; social standing by virtue of being a doctor only ensued via the use of that education for a career. … The history of modern medical professionalism is based on the inclusion of science in learning" (Geyer-Kordesch 1995, 100).

education at this time was the move to broaden scientific medicine in an institutional context. As Gadamer points out, the rise of modern science post-Galileo is significant in the development of medicine and its associated educational institutions: "[Modern] medicine is characterized by its capacity, based on the mathematical model, to organize concrete information concerning observed phenomena under general laws. … The development of constructive models which allow the fundamental features of a universal principle to be grasped in its concrete instances undoubtedly represents one of the decisive achievements of modern science" (1996, 97). Nevertheless, the tension between science and practice persists in medical education. "Once science has provided doctors with general laws, causal mechanisms and principles, they must still discover what is the right thing to do in each particular case" (Gadamer 1996, 95). As such, the language in the medical periodicals reflects this complexity. Because different factions competed on the nature of medical education reform, the periodicals play an important role as a source of interpretation on the connection between science and medical education during the early nineteenth century. More often than not, the urgency of science as ground for disciplinary aims and methods of inquiry is distinct.

One such example of outlining the disciplinary aims of the medical discipline is found in the 1799 volume of *LMPJ*. Here, the connection between theory and practice in medical education is clearly articulated.

> [I]n every well regulated University, or school of medicine, [theory] is taught before the Practice, it has obtained the name *Institutions of Medicine*. How can it be expected that any one should conceive accurately of disease, its causes and effects, preserve health by proper regimen, or restore it when lost, which are the objects of the practice of physic, unless he possess a competent knowledge of the animal fabric, the organization

> powers, faculties and functions of life and health? When this introductory knowledge has been acquired, the path to the more useful and valuable part of medicine, distinguished by the title of Practice, becomes direct, plain, and easy. (*LMPJ* 1799, 336)

Notice that this is a distinct description of the order in which medical education should be pursued, with theory (i.e., universal principles of medicine) as the governing precept to practice in medical education at "every well regulated University." As is clear in the passage above, abstract or general medicine resides in a solid foundation of learning the *Institutions of Medicine*, which the author explains as "delivering and explaining the general doctrines of anatomy, physiology, pathology, semeiotice, hygiene, and therapeutics" (336). In other words, these general theories/doctrines orient the general aims of medical pedagogy. It is worth noting that these medical subjects are the functional categories upon which medical education rests. In the early nineteenth century, these subjects accounted for the relevant science of medicine.

With an emphasis on the connection between theory and practice in medical education, the content of these periodicals tended to explore the increasingly organized disciplinary methods of inquiry to be acquired by medical students. An 1813 submission to *EMSJ*, "Pathological and Practical Observations," reflects the centrality of induction to methods of inquiry in medicine.

> It is, indeed, only by such close and scrutinizing observation of the operations of nature, that we can ever hope to acquire a perfect knowledge of her proceedings; or to arrive at fixed and unerring principles of pathology, so necessary for enabling us to apply, with confidence and precision, suitable treatment to all the varied forms in which disease is presented to us. … With such views respecting the objects of medical science, and the means of attaining these; and satisfied that, from general

> pathological principles, must the medical practitioner ever derive his best and surest aid in combating particular diseases. (174-5)

The immediate purpose, then, of the medical practitioner is to "combat particular diseases" through observation and conceiving the patient's condition within the context of "general pathological principles" whenever possible. Consistent with similar commentary in the early nineteenth century medical periodicals, I would argue that this essay shows a level of engagement with defining methods of inquiry in medicine common among advocates of medical education reform.

An 1805 essay in *EMSJ*, "Is There any Certainty in Medical Science?", devotes attention to the conflict over certainty and uncertainty in medical science. In what follows, I focus on a few aspects of the argument in the essay that are particularly characteristic of this problematic: namely, the significance of this subject in the contemporary medical periodicals and its relevance to medical education. As scientific medicine establishes itself in the institutions of Britain in the nineteenth century, perplexity over how to manage the inherent uncertainty in medicine persists. Although not fully realized, the rise of positivistic science grows out of this persistent concern. On this concern, Gadamer has the hindsight to filter this quality of medicine and its subsequent unfolding:

> Nothing which is capable of being experienced can remain withdrawn from the competence of science. If we encounter anything unpredictable, accidental, contrary to expectations, the claim of universality of science remains uncontestable for these things as well. … The progress of science is sustained by its continual self-correction. And practice which is based on the application of science likewise requires that science further and further improve, by continual self-correction, the reliability of the expectations placed upon it. (1996, 3).

Gadamer brings an advanced understanding of the problematic of medical certainty and uncertainty. With this statement, he offers a more sophisticated distinction between the theoretical impulses of scientific medicine and their constant confrontation with the uncertainties in practice. In other words, as science becomes the operating mode of inquiry in medicine, it must continually self-correct to maintain reliability and engender the confidence of patients and practitioners. However, as science is adopted in medical education, it slowly undermines the possibilities of a medical education rooted in humanistic practice. Science provided a different, more comprehensive vision of the place of medicine in relation to practice—a vision linked to the desire for certainty.

"Is There any Certainty in Medical Science?" is a rich source to understand the thinking of medical practitioners and educators at the beginning of the nineteenth century. This essay sought to tease out the complexity of this issue in scientific medicine by stipulating that induction was foundational to medical inquiry. The body, the author asserted, was "subject to the laws of inductive philosophy" (427). Strong belief in the use of induction marks the entirety of the essay: "one fact is explained by classing it along with other facts of the same nature; and since organic bodies are subject to particular laws, it becomes necessary to form those peculiar laws by induction" (427). Medicine was considered fraught with uncertainties.

> To particularize all the sources of uncertainty to which the practice of physic is exposed, would be endless: Let it suffice to say, that the art of medicine has for its object a most complicated, most fugitive set of phenomena. … [W]e are ready to grant that the science of medicine is not arrived at its ultimate degree of perfection; but our knowledge, so far as it goes, answers important and useful purposes in life. … A mistake of

> proceeding from ignorance or inattention should ever be referred to its true cause, as that is the only way to correct the want of skill. (426, 429)

Furthermore, the author claimed "uncertainty can never be the true character of any part of natural history, when the study of science shall be properly conducted" (427). The nature of this problematic is indicated here by a focus on the character of medicine. Insofar as medicine was under the auspices of natural history, uncertainty should be avoided and remedied by using science to practice and learn medicine. When considering the influence of science on the art of medicine, the author acknowledged "the science of medicine [has] not arrived at its ultimate degree of perfection"; however, the current state of medical knowledge—within the realm of inductive methods—offered, "answers important and useful" (429). In short, medicine defined as a discipline within natural history should aspire to certainty achieved through science. Disputes over the problematic of uncertainty in medicine would be resolved through scientific methods of induction.

More specific institutional commitments are made in the same 1805 volume of *EMSJ*. With debates beginning to rage on the merit of medical education in Britain, *EMSJ* set out to promote the respectability of an Edinburgh medical degree by listing the requirements and regulations. The journal laid out these specifics in order to appease any concerns about the training of an Edinburgh graduate "that the public may be enabled to judge of the respectability of an Edinburgh degree, and that those at a distance may know the conditions upon which it can be obtained" (1805, 391). Key elements of the requirements for a degree (see below) were (1) candidacy would not be considered

without proof of attendance of courses in all branches of medicine[109], (2) delivery of a medical dissertation, (3) completion of a medical examination by faculty either *viva voce* or in writing, (4) additional oral examinations subsequent to initial exams, and (5) all exercises for the degree were to be performed in Latin. Publishing these requirements and regulations demonstrated Edinburgh's commitment to rigor in medical education. Furthermore, it demonstrated the institutional framework necessary to enforce these stipulations. As medical education reform organized proceeding into the nineteenth century, proof of a solid institutional structure to medical education became vital[110]. Not only were the regulations published in *EMSJ*, but also each volume published the classes in the different branches of medicine offered at Edinburgh's medical school.

Figure 4.5a: Requirements and Regulations of Edinburgh Medical Degree

I. No person shall be promoted to the degree of Doctor in Medicine, except on one of the two stated days in every year; viz. on the 24th of June, or the 12th of September, or the days immediately thereafter.

II. No person shall be received as a candidate, until he has applied during three complete years to the study of Medicine, in this or some other university, and has attended to all the branches of the science of Medicine; viz. Anatomy and Surgery, Chemistry, Botany, Materia Medica, and Pharmacy, Theory and Practice of Medicine, and Clinical Lectures delivered by Professors of Medicine on hospital patients.

[109] Anatomy and surgery, chemistry, botany, materia medica, pharmacy, theory and practice of medicine, and clinical lectures in the hospital.

[110] Charles Newman argues: "As the science of medicine progressed, there grew a larger and larger body of technology for the student to learn, and whether it was applicable to the medical student or not, it appeared more closely related to it than the literary subjects. … [A] more and more progressively materialistic outlook was bound to affect that aim which educational reformers set before themselves as the object of their reforms: they saw, rightly, that doctors must acquire knowledge which put into their hands new power to treat their patients effectively and to prosecute further investigations which would continue to increase that power" (1957, 54-5).

Figure 4.5b: Requirements and Regulations of Edinburgh Medical Degree

III. Whoever is desirous of obtaining a degree must deliver, before the 24th of March, or the 12th of June, a medical dissertation, composed by himself, to some one of the Medical Professors, that he may peruse it, if necessary correct it, affix to it a written testimony that he has persued it, with the date when he received it.

IV. Then, whoever is desirous of obtaining a degree must communicate his intension to the Dean of the Faculty of Medicine, on or before the 20th of April or June, and at the same time deliver to him his inaugural dissertation, with the testimony of the Professor who perused it, to be subjected to consideration of the Faculty of Medicine.

V. After this, he is to undergo a medical examination by the Faculty, either *viva voce* or in writing, that no person may be received as a candidate who is not well acquainted with polite literature and the science of medicine.

VI. On the 18th of May, or 6th of August, the candidate shall, in an examination by two Professors, in the presence of the Faculty of Medicine, give a farther proof of his advancement in the various branches of medical knowledge enumerated above.

VII. To the candidate, after having passed these trials, shall be proposed, by some one of the Professors, an *Aphorism of Hippocrates*, and, at the same time, by another Professor, a *Medical Question*; the former of which explained by himself, and illustrated by a commentary, and the latter, along with an answer to it supported by proper arguments, he shall return to the Professors by whom they were proposed on the 28th of May, or 11th of August, and shall defend his commentary, and answer before the Faculty of Medicine on the 30th of May, or 18th of August.

VIII. If, by having duly fulfilled these conditions, the candidate shall deserve to be promoted, he shall receive from two of the Professors two histories of diseases, with questions annexed to them, for the purpose of writing an illustration of the one, and answers to the others. These histories, with the illustrations and answers, he shall deliver on the 12th of June, or 1st of September, to the Professor who proposed them, and defend them before the Faculty of Medicine on the 15th of June, or 3d of September.

IX. After the candidate has been approved of at his first examination on the 18th of May, or 6th of August, he shall be permitted to send his dissertation ot the press, and shall deliver eight copies, accurately printed, to the Dean of the Faculty of Medicine on the 15th of June, or 3d of September.

X. If the candidate, after having printed his dissertation, shall be approved of by the Medical Faculty at his third examination, all these proceedings shall be reported to the Senatus Academicus by the Dean of the Faculty of Medicine, with whose approbation and authority he shall be ordered to publish his dissertation, and defend in a meeting of the University on the 24th of June, or 12th of September, when, if the Senatus shall think fit, the highest medical honours, that is, the degree of Doctor of Medicine, shall be conferred on him with the usual solemnities, as the reward of his diligence and study.

XI. To give greater solemnity to all these proceedings, the Faculty of Medicine shall always meet within the University on each of the above mentioned days, at nine in the morning. And if any candidate shall absent himself at the hour appointed, without sufficient reason, he shall not be permitted, on this occasion, to proceed with his trials, or obtain the degree of Doctor in Medicine.

XII. All the above-mentioned exercises shall be performed in the Latin tongue.

Conclusion

In 1812, the *LMPJ* expressed concern with obviating inaccuracy and bias in the case studies reported in its pages: "medical opinions are valuable only when founded on incontrovertible facts" (1812, 2). This sentiment fit well with the spirit of medical periodicals in the early nineteenth century. The medical press played a deliberately active role in highlighting a concern with the need for more certainty in medicine based on induction and facts, i.e. science. As seen in this chapter, the strategy of exposing the defects in medical uncertainty and advocating for more exactness in medicine was commonly employed in medical periodicals. Crawford argues:

> An underlying concern of much programmatic medical writing of the late eighteenth and early nineteenth centuries was the problem of medical uncertainty. Medical authors frequently explained that the complexity of the bodily economy and the difficulty of assessing causation made it easy for charlatans to deceive the public with false or exaggerated claims. This preoccupation with fraud in the form of quackery was accompanied by concern about the prevalence of error in medicine generally. Growing dissatisfaction was expressed in medical journals about the quality of the evidence on which medical knowledge was based. The need for systematic and comprehensive induction was frequently reiterated. Reliance on medical authorities and on analogical reasoning was disapproved of, and it was becoming unacceptable to justify opinions with vague references to personal 'experience.' Scepticism with respect to medical facts was tirelessly preached in the medical press. … The medical journals themselves functioned as a sort of professional tribunal, providing critical reviews and a forum for debate, and imposing rules on the process of evaluation. (1991, 205-6)

While the medical periodicals of this time are only one source of evidence relevant to the study of medical education and practice, and their shift to science, they offer a reliable vantage point to consult in order to grasp the tenor of the debates. Indeed, examination of

the medical press offers a robust reading of the lines of argument that developed around medical education reform.

The medical press issued commentary on shifting priorities in medical education. As evidenced in the texts I have examined, reformists preferred neither ad hoc medical education nor humanist-based medical education. Education, in many of these arguments, could use more science. Furthermore, medical education needed a uniform approach to make it standard across Britain. The standard by which medical education could be "objectively" measured was medical curricula founded on scientific principles of investigation. The pages of these medical periodicals represent a working out of the "ideal" medical curriculum in Britain's institutions. Moreover, the medical periodicals repeatedly declared that medical education demanded more consistent rigor in order to train science-minded practitioners. In dealing with subject matter pre-eminently scientific during the early nineteenth century, such as chemistry and pathological anatomy, the medical periodicals strongly identified with scientific medicine. Given this focus, the ideal of medical education could be presented with respect to the "objective, certain, scientific knowledge that reformers envisaged for medicine in general" (Crawford 1991, 208).

Chapter 5

Parliamentary Papers: Britain Reforms Medicine 1830-1858

In 1832, *The Quarterly Journal of Education*[111] opened its third volume with an essay titled "Recent Improvement of Medical Education." Its emphasis on medical education was to acknowledge the quality of medical publications that had "issued from the press during the last few years, to present proofs that medical Education in England is assuming a much higher character than that, which, until within a few years past belonged to it" (1). A spirit of reform gripped Britain during the early to middle decades of the nineteenth century, represented in the Reform Act of 1832. The drive for medical education reform, the *QJE* outlined, was provoked by measures taken at Edinburgh's medical school to establish a solid curriculum upon which to train medical scientists and general practitioners.[112] Furthermore, education reform was fomented by the failure of the Royal College of Physicians to admit a broad base of physicians to their fellowship, predominantly limiting fellows to Oxford and Cambridge graduates. Finally, reformers perceived scientific medicine as a necessary focus for medical education in order to keep pace with Continental medicine, to even the playing field in medicine, and to improve outcomes in public health. In other words, the fulfillment of reformist ambitions began

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[111] *The Quarterly Journal of Education* was published under the "superintendence of the Society for the Diffusion of Useful Knowledge" in London (1832).

[112] The essay in *QJE* states: "Up to the present time no system of clinical teaching has been adopted in any school of London which is to be compared, in point of utility, with that so long pursued in Edinburgh, and which was, perhaps, never equaled except in Vienna during the time of the celebrated John Peter Frank" (17).

with scientifically educating the medical student. "The mere extent and rapidity of these changes in medical science have made some summary of them indispensable to the student, to the country practitioner, and to those engaging in the public service as physicians and surgeons" (20).[113]

In this chapter, I examine three key Parliamentary reports on medical education and practice published in 1830, 1834, and 1848. Each report echoes the debates taking place in Britain regarding medical education reform. Moreover, the reports elevate the status of medical education reform to that of a government policy issue, which helps in the eventual passage of the 1858 Medical Reform Act. A useful way of thinking about these reports, I argue, is to consider them in the context of reformers' desires to establish uniform standards for medical education founded on science, which would ideally result in "safe practitioners" of medicine in Britain. I suggest that these explicit purposes guiding medical education reform at the policy level can also be conceived as a working out of the relationship between disciplinary formation and practice in medicine. The conception of which is evidenced in the meticulously compiled minutes and findings of each report. Medical education reform manifests during this period as a government policy issue centered around the following issues: (1) ensuring a thorough scientific education for medical students, (2) defining the essential subjects for the medical discipline, (3) regulating medical practice by requiring rigid admission tests to be licensed, and (4) firmly establishing medicine under the educational auspices of science

[113] "The explanation of this continued want of a good system of medicine is, perhaps, that the time when such a work could be well composed by any one man has gone by. The science of practical medicine has become too vast to be shaped into a book by any individual writer, let his industry, or his research, or his zeal, be what they may" (*QJE* 1832, 18).

and not literature at the universities. I shall explore these Parliamentary reports by examining the ideal models they offer of a disciplinary and practical medicine based on science. In these discourses, emerging notions of what medical education should be are presented, suggesting an institutional shift—eventually codified in the 1858 Act—that suppresses the long-standing relationship between rhetoric and medicine in medical education and practice. I conclude with a brief look at some of the other legislative initiatives in Britain between 1830-1858 that serve as attempts to work out the place of science in medical education.

Parliamentary Papers

The term "Parliamentary Papers" represents all the materials generated from both houses of the legislature in Britain: (1) journal, votes and proceedings, debates; (2) bills, reports and papers; and (3) Acts of Parliament (Rodgers 1967, 1). My focus is on three reports generated by Parliament, which embody the results of a general Parliamentary inquiry into medical education during three periods of the nineteenth century, published in 1830, 1834, and 1848 respectively. Often, the reports generated by Parliament are referred to as "Sessional Papers," designating the session in which the report was presented to the legislature. Select committees of Parliament and a Royal Commission appointed to study Scottish universities wrote the reports considered in this chapter, the official titles are as follows:[114] (1) *Report made to his Majesty by a Royal Commission of*

[114] Select committees are small, consisting of fifteen members or less. "Appointed to consider special subjects on behalf of the House, they generally have the power to interview witnesses and call for evidence to be produced" (Rodgers 1967, 4). Beginning in the nineteenth century, the "House began to depend more and more upon the investigation by Commissions rather than by Select Committees. … This mode of

Inquiry into the State of the Universities of Scotland (1830), (2) *Report from the Select Committee on Medical Education with the Minutes of Evidence, and Appendix* (1834), and (3) *First, Second, and Third Reports from the Select Committee on Medical Registration and Medical Law Amendment; together with the Minutes of Evidence, and Appendix* (1848). Committees or commissions were (and still are) a vital part of Parliamentary proceedings because not all topics could be covered in floor debates. For my purposes, the sense of reform reflected in these reports is useful for determining the contemporary legislative function regarding medical education.

In these three Parliamentary reports, one can see development of a particular focus on the *systemization* of medical education. By "systemization," I mean something quite specific. "Systemization" in the context of medical education and practice in nineteenth-century Britain means adopting measures to agree upon the best curriculum, exams, and subsequent licensing of physicians. A system, therefore, would necessarily consist of a medical degree "equivalency" among the universities of Britain. This equivalency would allow the public and legislature to trust in physicians as safe to practice insofar as they had received a scientific medical education. A more established and consistent approach to medical education based on science would recalibrate the universities as capable of producing a British physician with certain competencies. If reformers had their way, when the Parliamentary inquiry into medical education was

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investigation had many advantages over the Committee method. Commissioners were not necessarily Members of Parliament, but might include men of affairs and experts in the subject under investigation. The term of their Commission was not limited by the Parliamentary session, and they could meet whenever they needed. Many of them traveled widely, examining a great number of witnesses" (Rodgers 1967, 22).

complete, medical education would be transformed, largely modeled after the medical curriculum at Edinburgh.

The movement in medical education reform toward greater involvement of the British Parliament in shaping the outcome of both the medical discipline and medical practice reflected the sentiment to reform professional education in general. No longer could the reform movement grow organically and gain any significant traction; it needed the help of Parliament. Furthermore, after the Apothecaries Act of 1815, the new breed of general practitioner was anxious to lay claim to more inclusive regulations in medical education and practice.[115] "[P]rofessional reform was part of the movement elevating the status of all professions, ensuring that if the most interesting occupations were to be reserved for the most intelligent, and rewarded by the highest remuneration, they should involve the obligation of an efficient and thorough education, rigid tests of admission, and adherence to a strict professional ethical code" (Newman 1957, 112). Undoubtedly, without the complicity of Parliament, medical education reform would not have succeeded. Even with the help of Parliament, it took decades to achieve. The adoption of science as a marker of professional status in medical education and practice was partly a

[115] Charles Newman argues "After 1815, in the medical world, two forces developed and gathered strength simultaneously: the scientific revolution and the radical political revolution. The one consisted of the application of scientific method to medicine itself and was, in the long run … successful" (1957, 82). Paul Underhill underscores the professional advantages to reform: "Between the end of the Napoleonic Wars in 1815 and the passage of the Medical Act of 1858, English doctors waged a long campaign to establish their professional identity, to enhance their collective status and to increase the economic rewards accruing to medical labour. Medical politics had been far from quiescent during the later part of the eighteenth century. However, the period between 1815 and 1858 witnessed an intensification of the profound social changes wrought by the dual revolution - industrial and bourgeois democratic - as it grew apace and brought into existence, as it matured, a viable class society. The relative stability and simplicity of the older social structure - an image evoked by one historian's misleading notion of a 'one class society' – was shattered as an unprecedentedly numerous population fragmented into diverse interest groups whose place in the new society was not fixed or ossified within a given static economic structure, but depended rather upon the outcome of processes of social negotiation and active political intervention" (1987, 149-50).

strategic move by reformers to ensure that medicine would be accessible to those with the properly sanctioned scientific medical degree.[116]

The direct engagement of Parliament with the disciplinary formation of medicine in the nineteenth century appears most clearly in the three reports I will discuss. Reform, undertaken by factions differently invested in the outcome, converged in the legislative process. Parliament's commitment to medical education reform during these decades manifests a concern with the way in which medical practitioners were trained under the auspices of specific disciplinary constraints. It is significant that Parliament recognized universities as the locus of viable educational change insofar as universities were the disciplinary home to medical training outside the apprenticeship model. A new type of medical discipline, founded on science as opposed to humanism, was crucial for the educational goals of reform, and the inculcation of medical inquiry based on experimental science. Medical education had begun its transformation in Britain with Edinburgh's emphasis on scientific pedagogues, slowly shifting the focus from teaching habits of inquiry common to rhetorical modes of thought and probabilistic reasoning to methods of classification and generalization of patient disease. With Edinburgh's medical curriculum largely modeled on the success of Continental experimental science and clinical lectures at the Royal Infirmary, Parliament began its inquiry into medical education with a commission to study the universities of Scotland—a significant portion of the report was devoted to the discipline of medicine.

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[116] See Shortt 1983: "By the rhetoric of science into the social vocabulary of the period, physicians secured a vehicle for their professional recognition" (62). See Also Abbott 1988 "[In the nineteenth century] professions [became] organized bodies of experts who applied esoteric knowledge to particular cases. They had elaborate systems of instruction and training, together with entry by examination and other formal prerequisites" (4).

Parliament's evaluation of Edinburgh's medical school curriculum cannot be understated insofar as university teaching "has long played a substantial role in the formation of competent practitioners" (Jardine 2000, 111). In order to calibrate the extent to which Edinburgh was producing competent practitioners, Parliament needed to closely scrutinize its medical school.[117] The study of Edinburgh's medical school curriculum was "an obvious source of understanding maintenance and change of disciplinary practices" and how to judge them in relation to the broader strokes of medical education reform (Jardine 2000, 111). Edinburgh served as a measurement of progress in the transformation to scientific medical education definitively lacking at Oxford and Cambridge and also served as a model for medical education at the new University College in London.[118] In this respect, Edinburgh's medical school was an obvious place for Parliament to start its inquiries.

A primary context for the legitimation of established disciplinary doctrines and related methods and practices is education. Thus, in textbooks, pedagogy, and exams one will find support of accepted methods and practices (Jardine 2000, 121). The state of medical education in the early nineteenth century in Britain was largely a contrast between the Scottish and English universities. The Parliamentary reports of 1830, 1834, and 1848 yielded an abundance of information on the conflict and factions within the medical discipline writ large—specifically between the Royal College of Physicians in

[117] Insofar as the Parliamentary reports analyzed in this chapter are manifestations of histories of medical education, Nicholas Jardine's explanation of disciplinary histories is useful: "The legitimating uses of history come into play in both the principal contexts of legitimation, the educational and the polemical; and they are, I believe, of great importance in explaining shifts of scene of inquiry. Moreover, they are of special concern to us given our interest in calibration of methods against precedents and standards; for calibration is an intrinsically historical activity" (2000, 124).

[118] Founded in 1826.

London and the progressive methods of teaching medicine in Scotland. Oxford and Cambridge had a deeply embedded tradition of teaching humanistic medicine.[119] In fact, there were not clinical lectures or scientific courses required for the medical degree.[120] In contrast, Edinburgh offered a scientific approach to medical education. It is important to consider the pedagogical traditions of each of these institutions in the context of Parliament's inquiries into medical education. "In the educational domain, [one must] emphasiz[e] the importance of canons of classic works and the control of their interpretation, of pedagogical methods and fashions, and, more generally, of modes of initiations into disciplines" (Jardine 2000, 146). One productive way to understand the norms of medical education in early- to mid-nineteenth century Britain is in the pages of these reports. In them, one can apprehend the conventions and practices of medical education and the relevant questions Parliament asked in consideration of medical education reform. Moreover, these reports preserve the debates central to endorsing a uniform medical education based on science.

Royal Commission of Inquiry into Scottish Universities, 1830

> The Course of Study in the Science of Medicine, which ought to be followed by persons desirous of obtaining a Degree as the title and introduction to Medical practice, we shall advert principally to the Regulations in the University of Edinburgh, being the University in which the Medical School is the most complete.

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[119] See Peter Slee 1988: "The function of [Oxford] was to provide, through the subjects best suited to the task, a unifying, binding, cultural education and an exercise in method. It was not the knowledge imparted through the study of classics and mathematics that was valuable but the skills, qualities and habit of mind developed by the nature of the subjects themselves" (66).

[120] D. S. L. Cardwell notes "[p]rofessional studies … had no place in the university[ies] [of Oxford and Cambridge]. Law was studied at the Inns of Court, medicine at the London hospitals and for clergy no special training was thought necessary. … The universities were concerned with the liberal education of men of a privileged class who would later adopt suitable professions or else follow a life of leisure. The educational ideal was the Christian gentleman; if he was a scholar, then so much the better; if not, then he would benefit from the corporate life in the university" (1972, 57-8).

Within the last twenty years there have been considerable improvements in the Course of Study for the Medical Degree. At present, in order to entitle a Candidate to be taken upon Trials for his Degree, the following is the substance of the Regulations or Statutes of the University, to which he must conform:

I. No one shall be admitted to the Degree of Doctor in Medicine who has not studied Medicine for the space of four years, during at least six months annually, either in the University of Edinburgh, or in some other University where the Degree of M.D. is given.

II. No one shall be admitted to the Examinations required for the Degree of Doctor, who has not given sufficient evidence—

1st, That he has studied, once at least, each of the following departments of Medical Science under Professors of Medicine in this or in some other University, as already defined:

Anatomy and Surgery
Chemistry
Materia Medica and Pharmacy
Theory of Medicine
Practice of Medicine
Midwifery, and the Diseases peculiar to Women and Children

Clinical Medicine, that is, the Treatment of Patients in Public Hospital, under a Professor of Medicine, by whom Lectures on cases are given

Botany _ _ _ _ _ _ _ _ _ _ _ _ _ _

2nd, That he has also studied, either in this or in some other University, such as is specified above, two at least (which he is at liberty to choose) of the following subjects:

Practical Anatomy
Natural History
Medical Jurisprudence and Police
Clinical Surgery
Military Surgery

} During a Course of at least three months. It is not permitted, however, to attend Clinical Surgery and Clinical Medicine at the same time

3rd, That in each year of his Academical studies in Medicine, he has attended two at least of the six months' Course of Lectures above specified, or one of these and two of the three months' Courses.

4th, That besides the Course of Clinical Medicine already prescribed, he has attended, during his studies, for at least six months of another year, the Medical Surgical practice of a General Hospital, either at Edinburgh or elsewhere, which accommodates at least 80 patients.

III. No one shall obtain the Degree of Doctor who has not studied, in the manner laid down, for at least one year in the University of Edinburgh.

IV. Every candidate, before he shall be examined in Medicine, must satisfy the Medical Faculty, at a private meeting convened for the purpose, that he has attained a competent knowledge of the Latin Language.

(*Report of the Commissioners on the Universities and Colleges of Scotland*, 1831, 58-9)

The *Report made to his Majesty by a Royal Commission of Inquiry into the State of the Universities of Scotland* is roughly 436 pages consisting of an inquiry into Scottish

universities, which was ordered by the House of Commons. One hundred sixteen pages were devoted to the University of Edinburgh including a substantive appendix of interviews with the faculty, course descriptions, and curricula change suggestions. The Royal Commission was explicit in its purpose to "make a Report to Your Majesty on the matters intrusted to us, setting forth the state of each University and College, and the Rules, Statutes and Ordinances which we may propose to be established therein" (1830, 6). The commissioners carefully assembled the charters of each Scottish university and relevant documents illustrating the history of the university and their present state.

> We, then, after due notice, examined at great length the Principal and Professors of the University of Edinburgh, with the view of obtaining more minute information than could be derived from documentary evidence, and for the purpose of collecting whatever opinions or suggestions they wished to submit to us, on every point of importance. (1830, 6)

The focus of the report was to submit the commission's opinion on eight specific subjects relevant to their inquiry: (1) "the Constitutions in the several Universities," (2) "the Course of Study followed in the different branches of knowledge taught in these Universities," (3) "the System of Instruction, or Mode of Teaching in the individual Classes," (4) "the propriety of Instituting some new Classes, and of modifying some of those now existing," (5) "the Duties of Professors," (6) "the Discipline and Management of the Classes," (7) "the Mode of conferring Degrees," and (8) "the Management of the Museums and Libraries" (1830, 7). The outcome of this research was to offer suggestions for revisions to Scottish universities when thought expedient by the Royal Commission.

The report was the first "General Visitation" to the Scottish universities in 130 years and the first ever for the Edinburgh medical faculty. "The Edinburgh medical faculty seems to have believed, and certainly behaved, as if they were victims of a surprise attack" (Rosner 1991b, 176). What the commission proposed was an ideal curriculum based on Edinburgh's medical school; it was hardly a radical critique, more of an endorsement and call to follow Edinburgh's lead. The motives of the commission were mixed: on the one hand they had hoped to recommend an undergraduate education similar to the English tradition of classical education, on the other, they realized the impact of Edinburgh's success in medical education and reluctantly validated it in their report. So, the objective was not simply to advocate for scientific medicine, rather to sort through the ways in which Edinburgh (and Scottish medical education in general) was outpacing Oxford and Cambridge in this regard. "Concern for the interests of professors and means of students had been build into Edinburgh medical education from the start, and the former, at least, had not changed dramatically from the day William Cullen began lecturing" (Rosner 1991b, 179). The commission had another interest, which was concern for public safety. Universities were not just responsible to educate future practitioners, but also to ensure that they were responsible to future patients.[121]

The measure by which the commissioners determined if changes were necessary was whether or not the established system of education "contributed to the general diffusion of knowledge." A broad measurement, this had a very specific meaning in

[121] "If, however, the medical faculty wished to assert that there was something in the institution of a University that made it different from merely a collection of private teachers, if there was some justification for six of those teachers to call themselves Professors and charge ten guineas for awarding medical degrees, then those Professors and that University had an obligation to the public to provide the best medical education possible" (Rosner 1991b, 180-1).

early- to mid-nineteenth century Britain. The Society for the Diffusion of Useful Knowledge was established in London in 1826. This society was part of a movement to form institutions for science and the arts; its founders were scientists, philosophers, and literary men of the period (Weiss 1991, 6).[122] Many of the key members of the society were involved in political and social activities, such as the Royal Commission. The principle governing the Royal Commission was to "suffer things [i.e. existing educational format] to remain as they are, unless it appeared on satisfactory evidence that an abuse or defect existed … we have [never] departed from this rule, except for in a few instances, for the purpose of extending a principle previously adopted and of approved utility" (1830, 8). Likewise, the commission intended that their report would provide provisions for the "gradual introduction of such improvements in the system of instruction" (1830, 11). Their report exemplified the perspective that "every alteration should be made with the utmost caution" and should "consider how deeply the country is interested in the result, to secure the fair influence of public opinion upon the deliberations of University Bodies" (1830, 11). The Royal Commission felt that a prescribed course or system of study was necessary to settle on "usages of Establishment, [without which] the objects of National education could not be adequately secured" (1830, 12).

The Royal Commission's report evaluated and presumed the higher branches of education as distinctly "Literature and Science." Here, the commission presents these two

[122] "In spring 1827, the society began an ambitious publications program. It issued dozens of treatises summarizing available knowledge, primarily on scientific and economic subjects, and written in nontechnical language for an audience of workingmen. Today, we might call these publications 'knowledge syntheses.' … [T]he society was concerned with *useful* knowledge, and they hoped that workingmen would benefit from their learning. The [Society] did not have 'utilization' in its charter … it did not seek to have its audience use the knowledge in specific ways. It aimed, as did many of the institutions set up in the period, at making people more literate about scientific, literary, historical, and ethical subjects and was primarily an institution of popular education" (Weiss 1991, 6-7).

branches of education as the rubric under which individual disciplines would fit: medicine, in the report, clearly belongs to science. “If the classes of a University are maintained for instruction in Literature and Science … [then] if [a] system is to be adhered to at all, care must be taken that the Course of Study shall be suitable to the purposes of a University, and calculated to promote the interests of sound learning … and that regulations are necessary … to render the Course of Study more perfect” (1830, 13). From this perspective, pedagogy is linked to maintenance of literature and science through the classes that support these subject areas. The commission’s outline of a subject “superstructure,” so to speak, for the interests of “sound learning” was an explicit reference to systematic adoption of knowledge in literature and science. Later in the report, by emphasizing a scientific approach to the course of study in medicine, the Royal Commission validates Edinburgh’s decades-old inclination—to organize medical education scientifically.

The Royal Commission organized its report around general content divided as such: arts, theology, law, medicine, and miscellaneous. This structure reflected the traditional university educational pattern of preliminary education in the arts followed by advanced training in a “learned” profession of law, theology or medicine. In addition to other topics, the section on medicine detailed its findings on preliminary education requirements, medical curriculum, exams, and regulations for the medical degree. Much of the section on medical education was conceived in terms of the teaching practices connected with the specific universities in Scotland. The role of the teacher was important insofar as it was a measurement of the handing down of disciplinary practices

within these medical schools. For my purposes, I will focus on the commission's report on Edinburgh's medical school.

In addition to the chairs of different medical and scientific subjects at Edinburgh, part-time teachers, many of whom had thriving medical practices, did a lot of the teaching in the medical school at Edinburgh. Despite the emphasis on scientific subjects in the medical curriculum at Edinburgh, this part-time teaching model disallowed the medical school to initiate a lot of original scientific work.[123] A unique characteristic of Edinburgh's medical school was that these "professional lectures" were taught by the equivalent of today's "specialist." Although this model limited the infrastructure for studies in experimental medicine, similar to that emerging on the Continent during the nineteenth century, Edinburgh managed to continue a strong pedagogical emphasis on science. "One reason for the vitality of Scottish universities was that they remained throughout the eighteenth century in touch with scientific thought on the Continent … maintain[ing] a constant traffic of ideas, especially with the universities of Holland" (Ashby 1958, 15).

The Royal Commission evaluated the existing curriculum at Edinburgh's medical school, course by course, which gives one a sense of the specific teaching practices at the medical school. In their report, the commissioners detailed the weekly ritual of each medical course and its respective content, interviewing the primary instructor of each

[123] It is important to qualify the pursuit of medical science within early- to mid-nineteenth century British institutions. In *Science and the Practice of Medicine in the Nineteenth Century*, W.F. Bynum offers a clarification: "[T]he pursuit of science would until sometime in the nineteenth century be qualified as a profession only in the inspirational aspect … Within medical science, three of the most energetic experimentalists of the eighteenth century were Lazzaro Spallanzani, Albrecht von Haller, and John Hunter. The first was a clergyman, the second a university professor turned local civil servant, the third a practicing surgeon. They were never called 'scientists,' since that word was not coined by William Whewell until 1833" (1994, 94).

subject. This approach offered evidence of what teachers were actually doing in their classrooms. For example, the treatment of the class of "Practice of Physic" summary states:

> This class, which is an essential one to all who contemplate obtaining a Medical Degree, meets one hour for five days of the week, during a session of six months, and there are many extra Lectures, and an hour frequently, though irregularly, for Examination. The numbers returned as having attended Session 1825-6 were 232 … In the Lecture delivered is given an account of the whole history, causes, symptoms and treatment of such diseases as require little manual operation in their treatment. The Professor avoids as much as possible theoretical views, confining himself to mere fact. The class, previous to his induction, had been carried on by his distinguished predecessors almost entirely by lecturing, he being the only one, till very lately, who has taught it, not only by Lecture, but by Examinations. … The Students are asked what are the symptoms of a disease, what is the mode of distinguishing one disease from others nearly connected with it; and in a particular manner, in what way it should be treated. (1830, 144)

Dr. Home, the course instructor, commented on the usefulness of exams to the course: "'I find the greatest advantage from that mode of teaching. It forces my Students to attend more carefully and pointedly to the Lectures; it obliges them from the strictness of the Examination, to read at home … and I am enabled to know a good deal of [them] … before they come for private Examination for a Degree'" (1830, 144). This passage shows how instructors of medical courses understood their role as pedagogues. Each course varied, but the pedagogical soundness of exams was at the forefront of many instructors' minds insofar as it offered a credentialing mechanism—course by course—for the students' advancement in and engagement with medical knowledge. In reporting such outcomes, Dr. Home outlined a pedagogical ideal for medical students, or an aspirational teaching structure. For him, exams held great pedagogic value.

Commonplace to medical pedagogy now, course exams were subject to intense scrutiny as pedagogical tools in medical education.[124]

The clinical medicine class informed the conception of the medical discipline at Edinburgh. New to medical education in the mid to latter part of the eighteenth century in Edinburgh, clinical lectures were a distinct mode of teaching scientific medicine. "In Clinical Lectures, whether Medical or Surgical, general truths are illustrated by special cases, selected for the purpose from the whole patients admitted into the hospital" (1830, 148). The practicality of clinical medicine also echoed the move to a generalizable scientific curriculum in medicine. So, in this regard, the class served disciplinary, pedagogical, and practical ends. The Royal Commission interviewed Dr. Duncan about the class and it "appear[s] to him to be one of the most important branches of Medical instruction in Edinburgh and that, in his opinion, there is two [sic] little of it required by the Statutes of the University, only six months attendance being insisted upon" (1830, 148-8). The Edinburgh medical school valued clinical medicine as important to qualifying for the degree in medicine. Instruction in the clinic was meticulously organized:

> The most proper cases are selected; a history of these is prepared, under the direction of the Professor, by two of the senior pupils, selected by himself, who are called Clerks. The patients are privately visited by the Professor, that he may be prepared for the public visit at 12 o'clock, when he examines the patients, an art of considerable difficulty, which is to be acquired only by experience. After pointing out to the Students how such

[124] The instructor of Anatomy and Surgery, Dr. Monro did not think that examination as a universal practice in medical classes would work: "Dr. Monro, however, was so much impressed with the importance of examination, that he established for that purpose the [a separate class for exams]. It is quite distinct from his ordinary class; and he requires from all who attend it an additional fee of a guinea. The institution is quite a private matter of the Professor, the existence of which is known to the Senatus, but it is not conducted under their authority, nor is the extraction of the fee expressly sanctioned by them. The examinations are conducted in Latin, and sometimes in English" (1831, 147).

> examinations should be conducted, he reports the results of his own, which is recorded by the Students in the same book in which they had previously inserted the history of cases. This is done daily while the case is under consideration of the Physician. (1831, 149)

Clinical teaching was a class through which students were not only taught the practice of physical exam and the general relationship between disease, but it was also an important aspect of the institutional arrangement at the medical school and a fundamental part of the curriculum through which students were indoctrinated.

The Royal Commission evaluated the place of literary studies as preparatory to a medical education. Often thought as essential preparation to the practice of physic, medical education's place within the scheme of literary training was questioned. Part of the function of a literary education was to inculcate rhetorical-humanist habits of thought enabling the physician to reason in order to make sound conjectures on what may be a plausible course of treatment. Increasingly divorced from these modes of thought, medical education's connection with the literary was now an uncertain pedagogical truth. If anything, professors saw literary training as a way to connect with patients and for the physician to conduct cautious reflection, but science was increasingly the preferred emphasis in medical pedagogy.

> There is, too, a connexion between the Sciences, the cultivation of one certainly predisposing, or at least creating a facility for the cultivation of another. And with a view to the general dissemination of knowledge, it would be of moment that a class of men so widely diffused, and mingling so much with society as the Members of the Medical Profession, should be so instructed as to be able to give a tone to conversation, or to promote among those with whom they associate the love and pursuit of literary and scientific accomplishments. But after granting all this, the question still remains, whether there should be, before commencing the study of Medicine, or while that study is pursued, the acquisition of what is

> commonly called a learned education; and it is as to this that most intelligent men of medical proficiency are not agreed. (1830, 187)

Rather than remaining central to medical education, literary education was seen as a supplement enabling the physician to be "well-informed … [and] would [allow them] access to sources of enjoyment peculiarly valuable in the sequestered situation in which many Medical Practitioners must spend the great part of their life" (1830, 190). Scientific study was increasingly important to medical education after the early decades of the nineteenth century as a means of legitimating its pedagogy and curriculum. If rhetorical-humanistic medical education suffered from the rise of scientific medical education, it is evidenced in these recommendations.

A crucial element to medical education was the discipline of the students. The Royal Commission devoted a section of the report to this issue. The commission emphasized not only the ability to conceive of a student doctrinally disciplined, but also disciplined by good habits. "With respect to the Discipline of the Medical Classes, the general maxims laid down are strictly applicable. Means should be devised for securing attendance, for examining the proficiency of Students; and for rendering the certificates which are given to them faithful representations of their conduct, and of their fitness [to enter] the profession" (1830, 191). These habits, the commission felt, were important to the "advancement of medical knowledge." The commission's enthusiasm for a disciplined medical student was part of the ideal disciplinary practices identified with a uniform medical education.

In the pages of the Royal Commission's report on Edinburgh's medical school, the subordination of literary training to scientific training in medicine was clear. Although classical preparatory education was a view the commission strongly held and highly recommended for the student prior to the course of study in medicine, the commission wanted to see in the university lecture halls medical curricula based on science. The report reflected the educational aims of the commission; it felt this focus would advance scientific knowledge. While the role of science in medical education was still working itself out, one thing was clear, that science must inhabit the majority of the medical student's disciplinary training. Educational institutions would achieve this goal if medicine was organized under science, not literature. In other words, the nineteenth-century university trained physician was validated professionally through an educational foundation in medical science. The stress on scientific medical education is perhaps the most distinctive feature of this report.[125]

Report from the Select Committee on Medical Education, 1834

> *Martis*, 11º *die Februarii*, 1834
>
> ---
>
> *Ordered*, That a Select Committee be appointed to inquire into, and consider of the Laws, Regulations and Usages regarding the Education and Practice of the various Branches of the Medical Profession in the United Kingdom.
>
> And the Committee is appointed of—
>
Mr. Warburton.	Mr. Hume.
Lord Viscount Howick.	Mr. Clay.
The Lord Advocate.	Mr. Robert Clive.
Mr. Littleton.	Mr. Ewart.

[125] The commission's stress on science in medical education was obvious, albeit adopted directly from Edinburgh's medical education playbook. Although, the commission still clung to the idea of a classically trained gentleman physician, the report began to concede ground: "[T]he medical faculty had also already won its case, for public opinion agreed that though a classical education might make a gentleman, 'purely professional' studies defined a physician" (Rosner 1991b, 194).

Sir Robert Inglis.
Mr. Goulburn.
Mr. Shaw.
Mr. Abercromby.
Mr. James Oswald.
Mr. Bannerman.
Mr. Andrew Johnston.
Mr. Halford.
Mr. Frankland Lewis.
Mr. Hawes.
Mr. O'Connell.
Mr. Spring Rice.
Sir Robert Peel.
Mr. Peter.
Mr. Strutt.
Mr. Edward Romilly.
Mr. Wolryche Whitmore.
Mr. George Wood.
Mr. Ord.
Mr. Gillon.
Mr. Sinclair.
Mr. Baldwin.
Lord Oxmantown.
Mr. Serjeant Perrin.
Mr. Jephson.

Ordered, That the Committee have power to send for Persons, Papers and Records.
Ordered, That Five be the Quorum of the Committee.

Your Committee beg to report, That, pursuant to the Order of their Appointment, they have inquired into the state of Medical Education, as prescribed by the regulation of the several Universities, Medical and Surgical Colleges or Faculties, and Apothecaries' Companies, and as actually practised at various Schools of Medicine, Surgery and Pharmacy; and also into the state of Medical, Surgical and Pharmaceutical Practice, in the three divisions of the United Kingdom.

(*Report from the Select Committee on Medical Education*, 1834, ii-iii)

The 1834, 920-page, select committee report on medical education was an explicitly political project that aimed to secure educational principles of medical education reform as well as consider the institutional and intellectual frameworks of governance most appropriate in achieving these principles. The committee's inquiry into medical education examined the disciplinary character of medicine within social relations and institutional constraints. In effect, the committee was faced with two competing "camps" of the reform movement, each gaining traction in Britain: (1) "adherents of a French-inspired enthusiasm for root-and-branch reform of historically entrenched medical corruption" and (2) "apologists for the peculiarities of English medicine" (Burney 2003, 166).

> For … critics of established medicine, science was first and foremost a way of invoking an alternative model of training and classification that obviated traditional distinctions (distinctions, for example, between medicine and surgery, manual and intellectual work, theoretical and

> practical knowledge), promising a new framework for medicine based on shared, systematically transmissible, and meritocratically accessible body of knowledge. In the view of enthusiasts for French medicine like Wakley [founder of *The Lancet*], in short, science was coextensive with the broader vision of a modern, democratic medical administration, and served simultaneously as a way to account for contemporary professional disorder and to define a path of resolution. (Burney 2003, 168-9)

If medical education were rooted in scientific curriculum, as opposed to humanist curriculum, then a more democratic educational model could emerge in Britain, an antithesis to the elite schools of Oxford and Cambridge, which provided a distinct model of training medical humanists. The Oxford-Cambridge model of medical education excluded a large portion of students who were trained differently at the Scottish and London medical schools, yet the graduates of these elite institutions controlled the Royal College of Physicians. The RCP controlled licensing in and around London and determined to whom fellowships would be given.[126]

Thomas Wakley was a key agitator for democratically focused medical education reform. Wakley used his medical periodical, *The Lancet*, to forward his campaign for reform. However, even with the platform of his periodical, Wakley realized it would be difficult to reform medicine as a private person, so he turned to Parliament.[127] He was influential in starting the medical education reform movement by enlisting the help of a Parliamentary member Henry Warburton, who headed the Select Committee on Medical

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[126] "Wakley and his colleagues were not simply fighting a battle against the medical elite. Instead, their calls for progressive reform were aimed at establishing the scientifically trained general practitioner as the cornerstone of a medical world that defined itself against the retrograde forces both of the elite *and* of the great unwashed—the world of alternative (or 'quack') medicine. … By excluding the rank and file from full membership, the royal colleges were telling the public that those who served them were unfit, thereby 'disgracing' the majority of practitioners and implying that their qualifications were not sufficient to distinguish them from those practising without a licence" (Burney 2003, 178).

[127] Wakley became a member of Parliament in 1835.

Education. In 1834, Warburton moved for an inquiry into medical education. The resulting report served as a "textbook" for the public and the representatives of Parliament on the medical world.

> The educational aspects of the Committee's investigation … show[ed] … the failure of the [medical] corporations either to promote education or to test its results properly in examination. The failure of the hospital medical schools to play their part in comparison with the private schools was also brought out. (Newman 1958, 152)

The report examined the state of medical education at an institutional and intellectual level. Each of these analytical vantage points referenced the principles of education at the core of Britain's medical education reform movement: (1) the role of science in medical education and practice, (2) the role of standard curriculum and exams in medical education, and (3) the role of medical education in producing competent practitioners. The process of assessing medical education with these principles in mind suggested that medicine as a discipline in Britain was in need of disciplinary revision.

In order to revise medicine as a discipline, the select committee had to deal with the RCP. Because the RCP held sway with Parliament, the committee had to expose the weaknesses of this organization in order to make room for their reform agenda. A significant portion of the select committee's report was devoted to interviews with office holders and members of the RCP. The committee was concerned with the RCP's description of its purpose, and more importantly, its efforts to admit a specific type of physician to its fellowship—in short, its exclusivity. The climate of reform in the 1830s changed the range of questions valid for the committee to ask. The RCP was no longer a

protected organization; rather, it was seen as a group of elite physicians desperately clinging to the old orders of medicine.

On April 16, 1834, the select committee interviewed James Copland, M.D., a graduate of Edinburgh's medical school in 1815 and a licentiate and fellow of the RCP in London. During this interview, Copeland attacked what he perceived as the antiscientific posture of the RCP:

> Have you been extensively engaged in investigations, connected with medical literature?—I have.
>
> Are you engaged in publishing a Dictionary of Medicine?—I am.
>
> What influence in your opinion has the College of Physicians had on medical science in this country?—I cannot conceive that the influence has been a favourable one. I think the restrictions into the fellowship have in some degree tended to retard the advancement of medical science.
>
> Will you explain what restrictions you allude to, and explain in what way those restrictions have had this effect?—The restriction of the fellowship to graduates of Oxford and Cambridge has excluded a great many well-educated and scientific men; men well educated, not only in the various departments of science and literature, but also in medicine.
>
> In what way has that exclusion had an injurious effect?—The restriction I have stated has indirectly been the means of excluding scientific and industrious physicians from admission into public institutions, especially hospitals, in London. Hospitals are among the very first, and perhaps are the principal sources of medical education and science; they are amongst the chief sources of advancement in medical science. (1834, 205).

The committee was especially interested in Copeland's response in light of the state of medical science in Britain as compared to the Continent. When asked about this issue, Copeland responded "I believe that at the commencement of this present century, we were about half a century behind the state of medicine in the greater part of Germany, if

not in France" (1834, 205). The committee assessed Copeland, and other interviewees, remarks on the RCP's role in the advancement of medical science in Britain by the extent to which the fellows of the college actually made improvements to medical practice and education. In other words, was the RCP a viable institutional mechanism to promote disciplinary and practical advancements in medicine? Copeland responded "I conceive, since the University of Edinburgh became a celebrated school of medicine … that there arose a class of physicians in this country, who by their investigations tended more to promote medical science than the fellows of the College" (1834, 205). One of the measurements by which the committee determined this failure was the RCP's small contribution to medical publications in Britain. From this perspective, the primary institution the government relied on for the advancement of scientific medicine, in effect, was not achieving those outcomes.

Crucial to understanding the role of science in medical education and practice during this period in Britain was the push to eliminate the longstanding institution of the orders of medicine (surgeon, apothecary, physician). Resistant to this change, the RCP believed that the integration of surgery with the practice of physic would lower the standard of medicine in Britain. On June 20, 1834 the committee examined Edward James Seymour a physician at St. George's Hospital in London. A Cambridge graduate, who had also practiced medicine on the Continent after taking a degree in Arts, Seymour fit the standard profile of hospital physicians in London. The committee specifically addressed the issue of surgery and physic with him:

> Is it advisable in any degree to restrict surgeons from practising medicine?—I think the practice of keeping the professions distinct is of great service; I think it leads to greater eminence in each. …
>
> Is not a certain knowledge of surgery very essential to a physician; and for a surgeon to treat skillfully surgical cases, is not certain knowledge of medicine and medical treatment extremely necessary?—I think it is desirable that in both cases that should form part of the studies.
>
> Then up to a certain point you think that the elementary education of a surgeon and of a physician should be the same?—I think the elementary medical education of a surgeon or a physician cannot be too extensive.
>
> Except what regards the acquirement of manual dexterity, should not the education of the surgeon be nearly that of a physician?—I cannot say, in all its bearings, that I think that: operations, and what is peculiar to the surgeon's province, would require considerable time, which might be otherwise better occupied in the education of a physician.
>
> Are you aware that in many of the continental schools, up to a certain point before they take their degree, the studies required of both run *pari passu*?—I am aware of that. …
>
> Is that an expedient course of education?—I am inclined to think not. (1834, 62)

This exchange reveals quite a bit about the antagonism between the classically trained Oxford-Cambridge physician and the new breed of surgeon-apothecary (or general practitioner). Seymour identifies the roles of physician and surgeon as distinct. He grants that each should understand the other's expertise, but an extensive training in surgery, according to Seymour is not necessary to practice physic or vice versa. The principle of *pari passu* education for physicians and surgeons, similar to the Continent, was objectionable to Seymour. Seymour's bias was evident throughout his responses, despite his acknowledgement that a physician's education should include dissection and anatomy, he did not think that operative surgery was appropriate to the practice of physic.

> Then you except whatever ears upon the manual skill of the surgeon; and with [the] exception [of operative surgery], you agree that all the principles of the various branches of medical science ought to be common to both?—I think so.
>
> In what respects does the plan which has been adverted to, as carried into effect at Berlin, differ from that which you state you think would be advisable?—I apprehend that operative surgery and attention to surgery is there pursued rather to the exclusion of the doctrines and what may be called the literature of the profession. (1834, 62)

These comments suggest that both surgeons and physicians should be educated according to the same scientific principles; the practice of both professions requires the same foundational education. However, the interview gives a clear indication that the division of labor between surgeons and physicians, insofar as it was endorsed by the RCP, should remain in practice. Clearly, the medical curriculum both at Edinburgh and on the Continent, which integrated surgery with physic, was influential to the case the committee was making for education reform. This example illustrates well the sought-after common role of science in medical education, whether a surgeon or a physician.

The 1834 select committee specifically addressed equivalencies between Britain's universities with regard to medical knowledge and the RCP's licensing of practitioners. The committee's reasons for connecting disciplinary realities at universities with practice vis-à-vis the RCP was to make the case that RCP's privileging of Oxford and Cambridge graduates was an arbitrary measure unrelated to knowledge equivalencies or disciplinary training at the universities. Indeed, Oxford and Cambridge lacked the scientific focus of Edinburgh in its medical curriculum. "[T]here are certain indisputably prevalent features of the handing from generation to generation of disciplinary practices … curricula,

especially in the idealized forms in which they figure in encyclopedias, university statues, etc., generally embody not merely a classification of the disciplines, but also evaluative rankings" (Jardine 2000, 111). In a March 21, 1834 interview with Pelham Warren, M.D., a fellow at in the RCP, the committee pressed this point.

> The education at the English universities you consider not ensuring any high standard of acquirement in the medical sciences; but as ensuring a high standard of manners and morals?—A high standard of general education and of general information. …
>
> Looking at the universities as schools of medicine, in what light do you regard them?—I do not know what their present state is. …
>
> The Scotch universities are much more important as medical schools than English, are they not?—There is more medical education at Edinburgh. …
>
> Is there not some inconsistency in making education at universities which possess small means of teaching medicine, the *sine qua non* for admission to the College of Physicians; and in depriving those who have studied at other universities which have ample means of teaching medicine of the privilege of entering said College?—I can only say, what I repeated before, that for the medical education we grant the licence; and for the learned education of the universities, we grant the privilege of being sooner admitted to the fellowship.
>
> Would it not be better to institute an examination of all persons who presented themselves, wheresover educated, whether they possessed the requisite qualifications? (1834, 92-4).

The committee's emphasis on institutional standards and equivalencies for medical education becomes even more apparent as they continue questioning Warren. The committee particularly focused on the arts training equivalency between the English universities to make the point that the RCP favored Oxford and Cambridge. "Is not that standard [of education] … easily attained at other universities than those of Oxford and Cambridge" (1834, 92). For example, the committee asked "the necessity of an ad

eundem degree at Oxford and Cambridge to a graduate from Dublin University, is more a matter of form than of substance" (1834, 93). The committee then illustrates with a series of hypothetical scenarios for admission to the College to press the issue of RCP's nepotism. The committee repeats this line of questioning with several interviewees, clearly indicating their partiality to reform the corruption present in the medical corporations and the RCP. Reform would be comprised of changing the standard curricula at universities to reflect the realities of medical practice. The committee asked Warren "Is there any advantage, in your judgment, in obliging a party who has been examined at the universities before professors, conversant with perhaps only the theory of medicine, being subsequently examined by a board, consisting of men high in practice?" (1834, 93). In effect, the committee recommended that the RCP examining board for licensing practitioners be sensitive to their failure to take into account their biases. Biases that imposed limits on medical education reform based on scientific standards in medical curricula.

Within the context of the committee's report as a whole a persistent theme was the proper mode of examining a British university graduate to be licensed as a practitioner by the RCP. The committee qualified its line of questioning regarding examination standards as a causal analysis between the method of examination and the outcome of the practitioner. In other words, if examiners emphasized certain subjects, then the exam would prove a more reliable litmus test for competent practitioners in Britain. On March 18, 1834, the committee conducted a lengthy interview with Sir Henry Halford, acting president of the RCP. They discussed the nature of exams:

> Ought those who wish to become licentiates to undergo distinct examinations upon the subjects of pharmacy, midwifery, and surgery?—No, not distinct examinations; they are included in the general examination.
>
> Are you not aware that it is the ordinary course, in the examination of Edinburgh, to go seriatim through the several branches of medical science, and to inform the students of the day on which they will be examined in each branch?—I am not aware of the practice there, but that is our practice; the president and each of the censors is at liberty to put every question he pleases.
>
> Is it not a more secure way of insuring proficiency in those branches of science, not to leave it to chance, but to make it certain that they will be examined in each branch? Our business is rather to find out what they do not know, perhaps, than to confine ourselves to what they do know. (1834, 29).

Exams represent a way in which educators may preserve and communicate disciplinary norms. As such, the content of the licensing exams suggested a specific value placed on a body or system of knowledge, in this case, the scientific branches of medicine. However, the committee felt without a systematic approach to all the scientific branches of medicine in the exam, the RCP acted arbitrarily and without protocol. In short, the exams were somewhat discretionary and not of value to measure the competency of a potential practitioner against his scientific knowledge. The committee's concern centered on not only the wish for medical education reform, but also on the role of the licensing exams for the maintenance and reinforcement of scientific disciplinary norms in medicine. Here, one finds the exam as representative of medical education reformers' concerns with the connection between exams and sufficient medical education—the result ideally being a more uniform standard for practitioners.

First, Second and Third Reports on Medical Registration and Medical Law, 1848

> THE SELECT COMMITTEE appointed to inquire into the Registration of legally qualified Practitioners in Medicine and Surgery, and into the Laws and Charters relating to the Practice of Medicine and Surgery in *Great Britain* and *Ireland*; and who were empowered to report to the House from time to time;
>
> HAVE made Progress in the Inquiry to them referred, and have examined several Witnesses; and have agreed to report their Evidence to the House.
>
> (*First, Second, and Third Reports from the Select Committee on Medical Registration and Medical Law Amendment; together with the Minutes of Evidence, and Appendix* 1848, iii)

In May 1847, Wakley (now a member of Parliament) realized that opposition was still too strong to get a medical reform bill to pass in Parliament, so he moved to set up another select committee to inquire into the state of registration and the practice of medicine and surgery. The goal of this committee was to establish facts that would gain support for a law to distinguish legitimate medical practitioners from quacks.

> [The committee] produced no report or comments (though commissioned to do so), but published the evidence they had elicited in full. Perhaps they thought that summary or comment could only weaken the force of what they had produced: certainly nothing could be more convincing of the need for reform than the evidence itself. (Newman 1957, 171)

A reinforcement of the prior work of the 1834 select committee, this report offered further evidence and momentum for reform. The thrust of the committees work in this report was to provide evidential considerations for both the public and Parliament, emphasizing the need for a law ensuring safe medical practitioners in Britain. The three reports totaled 616 pages of transcripts from the committee's interviews of witnesses.

Discussing the legal qualification of medical practitioners required the select committee to consider the institutional factors that had shaped the present situation in Britain. These institutional factors included things such as the layout and reliability of

both educational and credentialing institutions, status of authority figures, changes in patterns of medical education, and career patterns and division of labor in medical practice. In order to bring about new regulations in medical practice, Wakley's committee had to convince the broader public and Parliament that reform of the existing the institutional set up was necessary to impact change in disciplinary medical education, thus resulting in more qualified medical practitioners. In order to do this, the committee measured this conflict against precedents and standards in medical education and licensing authorities.

The committee explicitly addressed the establishment of a Council of Health for the Regulation of Medical Education. Witnesses expressed both support and rejection of such a measure. Wakley was keen on seeing such a credentialing authority established. This body would be centralized for Britain and would coordinate all aspects of medical education. Essentially this council would ensure that practitioners had been properly educated to qualify them for medical practice. In the committee's May 9, 1848 interview with Robert Christensen, a physician in Edinburgh, the issue was addressed.

> Do you consider that it will be advantageous to the public, to establish a Council of Health?—Yes, for the regulation of the courses of medical education; but if it is understood that this Council of Health is also to take up matters relative to public health, other matters than medical education, I should say that it will have too much on hand, and that a different name should be got for it; the same persons may be admirably well qualified as councillors for education, who are not so for other matters, therefore a body that regulates medical education may be by no means the best, or in fact may be absolutely without qualifications required for the very different questions which arise relative to public health. …
>
> If a medical council were to be elected, consisting of three or four members, connected for example with the chief institutions in England, and two or three members connected with the chief institutions in

> Scotland, and as many more with reference to Ireland, do you not conceive that the Presidents for instance of such bodies, meeting either in Dublin or in Edinburgh or in London to consider the state of medical education once a year. (1848, 26)

Traditionally, the medical corporations in Britain had provided the common route to qualification as a practitioner. The proposed Council on Health would create a different system through which medical education and credentialing would be centralized. The effect on medical education would be that all students would essentially follow the same course of study in the branches of scientific medicine. In a similar interview with George James Guthrie, M.D. on March 3, 1848, the committee brought up the same subject.

> My opinion … is that it would be very advisable not to have a Council of Health … but a Council of Medical Education; that that Council should be formed by one or more gentlemen sent from each of the colleges, and that the Secretary of State should add three or four laymen upon the same occasion, where all points might be discussed. (1848, 33)

The requirement expressed is that the proposed Council of Health and/or Medical Education would be a central authority to which the various curricula could be referred. The universities would use the resources of the council to ensure that qualifications were consistent across Britain for medical practice.[128] Also, the goal of such a council would be to ensure disciplinary consistency in medical education across institutions.

The ways in which medical labor was divided proved a central concern to the 1848 inquiry by the select committee. This concern was communicated through the

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[128] The resulting General Medical Council of the 1858 Act is described by C. Newman: "it was to consist of members chosen by each of the licensing bodies—Colleges, Halls, and Universities … and six nominated by the Crown of England … All members of the Council were to be medically qualified. Thus it was proposed that the profession should govern itself, the members being all doctors, but that the council should be both representative and nominated. The Council was not to be answerable to the House of Commons, by being presided over by a Minister" (1957, 186).

controversial title of "general practitioner" and what legal adoption of this title would mean to the state of medical practice in Britain. It was generally believed that the title of "M.D." should not appear upon the register with reference to general practitioners. Robert Christison clarified the controversy, "the public might suppose that persons, that is to say, general practitioners with the title of M.D. before their names, were registered in a class to which they did not belong … the object … was to preserve to order of physicians distinct from that of general practitioners in England" (1848, 31). In April 1845, a large body of practitioners met in London to discuss the possibility of establishing a separate college for general practitioners. General opinion was that such a college would merely be a substitute for the Society of Apothecaries and was not necessary. Moreover, some believed that the only distinctions necessary in medicine were physician and surgeon. Speaking to Peploe Cartwright on July 4, 1848, the committee asked him to clarify his dismissal of the term "general practitioner":

> I understand you to consider the proposal of a new body under the title of general practitioners as superfluous on this account, consistently with your views, that you consider that every surgeon ought to be thoroughly educated as a physician, and every physician ought to be a thoroughly educated surgeon, and that by consequence, those two bodies together ought to form the body of general practitioners, without the necessity of introducing any specific body under that name? (1848, 262).

All of the discussion surrounding the title of "general practitioner" elicited a broader concern for the changing patterns in medical practice and the requisite education in

response to these shifts.[129] Still undetermined in 1848, the debate over medical education reform fiercely continued fueled by professional and factional interests.

Finally, proposals for how to register medical practitioners and the most useful method of doing so were discussed. The proposal was to establish a medical register of qualified practitioners under the auspices of the proposed Council on Health. The principles on which to establish the register was a huge point of contention. Should it be based on two classes of practitioner or more? One area of agreement was that the names on the register should be made public in order to qualify the safety of practitioners against the measurement of the register. On July 11, 1848, Thomas Laycock argued that the public should be a key determinant in deciding how best to use such a register. "Do you think the public would take the word of the qualified practitioners as to who was, and who was not a quack?—I believe they would, if there was an authorized body publishing the list" (1848, 281).

The select committee's 1848 report provided much more detail than the 1834 report as to the recommended course of study at the respective universities in Britain. The goal with specific medical curriculum recommendations was to produce a very specific

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[129] Loudon explores this tension in *Medical Care and the General Practitioner*: "There are two separate though connected aspects to the status of the general practitioner. First, his status in the eyes of his fellow practitioners and secondly, in the eyes of society as a whole. … [I]t was the physicians who had the most to fear. … [T]he flood of papers in the medical press … said, in essence, the same as the raw licentiates, asserting that the medical education of general practitioners was at least as good as, the physicians'. … By the 1830s, examples of general practitioners could be found in many provincial areas whose practice and reputation seemed to make nonsense of rank and divisions in the medical profession. When this was said publicly, however, it was strongly denied by the medical corporations. … Many of the witnesses to the Select Committee on Medical Education (1834) stressed the high level of education of general practitioners. … To an increasing extent people were saying that the general practitioner had been created by a public demand for a reliable, education all-rounder, to replace physicians and surgeons who colluded with each other and the apothecary to rob the patient. 'The public stood in need of a general Practitioner—that is, one who could officiate in all departments of the profession and dispense medicines as well as prescribe'" (1986, 189, 193-5).

type of practitioner. What resulted was a sentiment that the public could be ensured a "safe" practitioner through the rules and regulations set forth by Parliament. Furthermore, through regulation, a practitioner possessing a very specific type of literacy would emerge through a scientific medical education. Appending a table to the report, the committee listed each educational institution, the course(s) to be taken, and the length the student must attend the course (see below). These legitimizing strategies for medical education and the call for standardization in curricula were centered on science. The report made explicit what should be built into curricula and the routines of the medical student. All of this was done through invoking the authority of Parliament—later the Medical Act of 1858 would make an iteration of this law. Medical education became the principle context through which to ensure that science was adopted in the institutional discipline of medicine.

Appendix, No. 2.

COURSES OF STUDY FOR MEDICAL DEGREES AND LICENSES

	University of Edinburgh. Degree of M.D.	University of Glasgow. Degree of M.D.	University of Aberdeen. Degree of M.B. and M.D.	University of Old Aberdeen. Degree of M.D.	University of St. Andrew's. Degree of M.D.	University of London. Degree of M.B.	University of London. Degree of M.D.
Preliminary Education.	examination in Latin.	examination in Latin.	degree of A.M, *or*, examination in Latin.	Degree of A.M.	degree of A.M., *or*, examination in Latin.	a degree in arts in a university, or the matriculation examination.	degree of Bachelor of Medicine in the University, *and* clinical or practical medicine, two years in an hospital or medical institution recognised by the University, *or*, clinical or practical medicine, one year as above and three years in practice, *or*, if the candidate has taken the degree of B.M. in the University, five years in practice.
Period of Professional Study.*	4 winter sessions, each of 6 months' duration.	4 winter sessions, each of 6 months' duration.	4 winter sessions, each of 6 months' duration.	4 winter sessions, each of 6 months' duration.	4 winter sessions, each of 6 months' duration, or 3 winter and 3 summer sessions.	four years in professional study at a school or institution recognised by the University.	
Anatomy	1 course of 6 months, 110 lectures.	1 course of 6 months, 110 lectures.	1 course of 6 months, 110 lectures.	2 courses of 6 months.	2 c. of 6 months, 110 lectures each.	-	
Practical Anatomy	6 months, with demonstrations.	6 months, with demonstrations.	6 months, with demonstrations.	2 c. of 3 months, with demonstrations.	12 months, with demonstrations.	12 months	
Chemistry	1 c. of 6 months, 110 lectures.	1 c. of 6 months, 110 lectures.	1 c. of 6 months, 110 lectures.	1 c. of 6 months	1 c. of 6 months, 110 lectures.	-	
Practical Chemistry	-	-	60 lessons	1 c. of 3 months	1 c. of 3 months, 60 lessons.	1 course, extent not stated.	
Institutions of Medicine, or Physiology.	1 c. of 6 months, 110 lectures.	1 c. of 6 months, 110 lectures.	1 c. of 6 months, 110 lectures.	1 c. of 6 months	1 c. of 6 months, 110 lectures.	-	
Surgery	1 c. of 6 months, 110 lectures.	1 c. of 6 months, 110 lectures.	1 c. of 6 months, 110 lectures.	1 c. of 6 months	1 c. of 6 months, 110 lectures.	-	
Military Surgery	-	-	-	-	-	-	-
Clinical Surgery	3 months, 3 meetings per week.	-	3 months, 3 lectures per week.	1 c. of 3 months	1 c. of 6 months	-	-

Figure 5.1a: Courses for Study for Medical Degrees and Licenses

Materia Medica and Pharmacy.	-- 1 c. of 6 months, 110 lectures.	-- 1 c. of 6 months, 110 lectures.	-- 1 c. of 6 months, 110 lectures.	1 c. of 6 months	-- 1 c. of 6 months, 110 lectures.	- - -	- - -
Practical Pharmacy	-- 6 months, or apprenticeship.	- - -	-- 6 months, or apprenticeship.	-- 3 months, or apprenticeship.	-- 6 months, or apprenticeship.	-- time not specified.	- - -
Practice of Medicine	-- 1 c. of 6 months, 110 lectures.	-- 1 c. of 6 months, 110 lectures.	-- 1 c. of 6 months, 110 lectures.	1 c. of 6 months	-- 1 c. of 6 months, 110 lectures.	*Attendance on six of the following Courses, at the option of the Student:*	- - -
Clinical Medicine -	-- 6 months, 3 meetings per week.	- - -	-- 6 months, 3 lectures per week.	2 c. of 3 months	1 c. of 6 months		- - -
Midwifery, and Diseases of Women and Children.	-- 1 c. of 6 months, 110 lectures.	-- 1 c. of 6 months, 110 lectures.	-- 1 c. of 6 months, 110 lectures.	1 c. of 6 months	-- 1 c. of 3 months, 60 lectures.	-- Descriptive and surgical anatomy, general anatomy and physiology, comparative anatomy, pathological anatomy, chemistry, botany, materia medica and pharmacy, general pathology, general therapeutics, forensic medicine, hygiene, midwifery, and diseases of women and infants, surgery, medicine.	- - -
Medical Jurisprudence.	-- 1 c. of 3 months, 60 lectures.	-- 1 c. of 3 months, 60 lectures.	-- 1 c. of 3 months, 60 lectures.	1 c. of 3 months	- - -		- - -
General Pathology	-- 1 c. of 6 months, 110 lectures.	- - -	- - -	- - -	- - -		- - -
Botany - -	-- 1 c. of 3 months, 60 lectures.	-- 1 c. of 3 months, 60 lectures.	-- 1 c. of 3 months, 60 lectures.	1 c. of 3 months	- - -		- - -
Natural History -	-- 1 c. of 3 months, 60 lectures.	- - -	- - -	- - -	- - -		- - -
Hospital Attendance	18 months -	2 years - -	18 months -	18 months -	18 months -		- - -
Natural Philosophy	- - -	- - -	- - -	- - -	- - -	- - -	- - -
Apprenticeship, Dispensary Practice.	-- apprenticeship, or 6 months' dispensary practice.	- - -	- - -	- - -	-- apprenticeship, or 6 months in a laboratory.	- - -	- - -
Age of Candidate for Degree or License.	21 years - -	21 years - -	-- M. B. 21 years. M. D. 22 years.	21 years - -	21 years - -	21 years - -	22 or 23 years

The number of lectures stated is the minimum. All the courses of lectures prescribed by the University of Edinburgh, and the University of Aberdeen, are required to be taken in a University.

N. B.—By the Regulations of the Army Medical Department, in addition to affording proof of attendance on the course of study laid down, candidates for situations in the Medical Department of the Army, must "possess the diploma of either of the Colleges of Surgeons of London, Edinburgh or Dublin." By the Regulations of the Medical Department of the Navy, in addition to affording proof of attendance on the course of study laid down, candidates for

* The statutes of the University of Edinburgh do not require more than one course of lectures on any subject; but candidates invariably take more than one course on every important subject. The reason for the limitation of the number is, that the candidates may attend the additional courses with extra academic teachers, if they please; for every course, if specified in the statutes, except Practical Anatomy, must be taken in some University which grants Degrees.

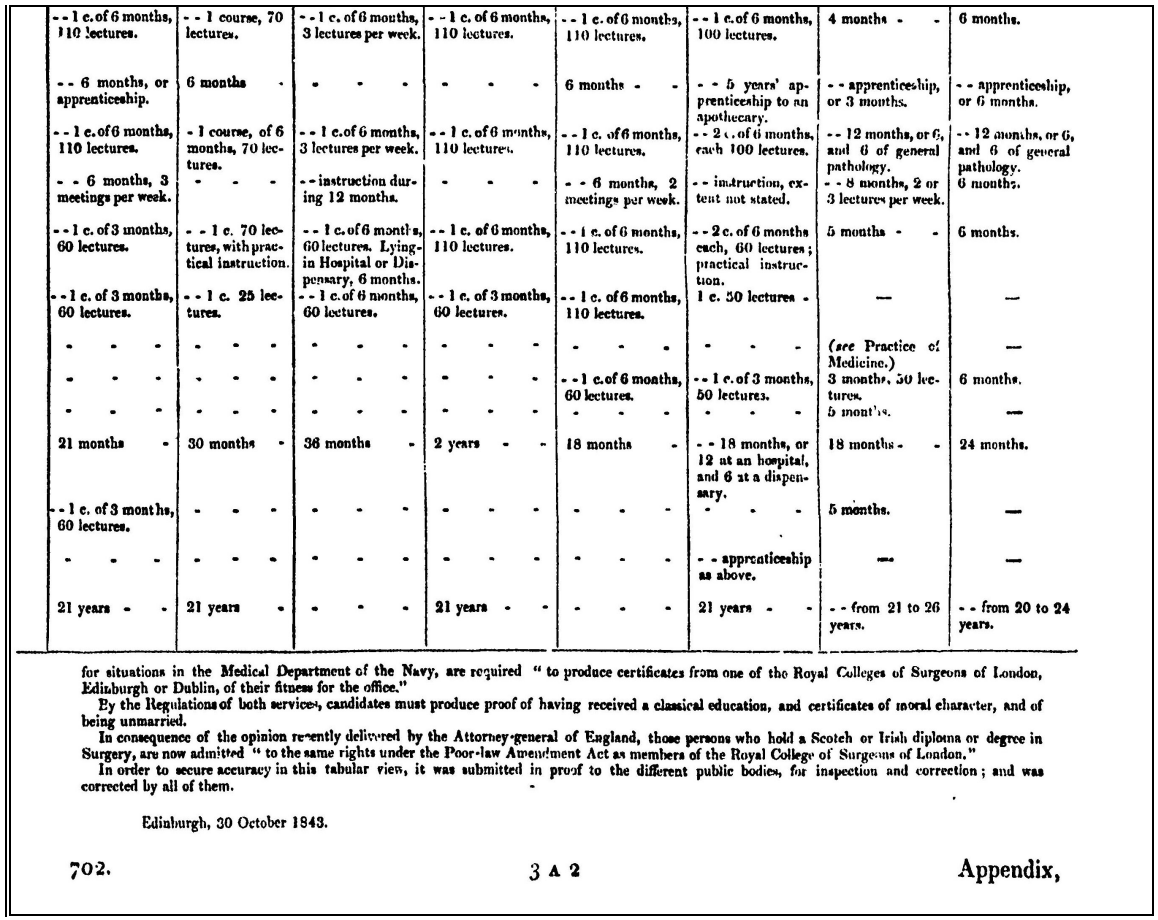
Figure 5.1b: Courses for Study for Medical Degrees and Licenses

Appendix, No. 2.

PRESCRIBED BY THE LAST REGULATIONS OF THE

Royal College of Surgeons, Edinburgh. Diploma.	Royal College of Surgeons, London. Diploma.	Royal College of Surgeons, Dublin. Letters Testimonial.	University of Glasgow. Degree of Magister Chirurgiæ.	Faculty of Physicians and Surgeons, Glasgow. License.	Apothecaries' Company, London. License.	Medical Department of the Army.	Medical Department of the Navy.
- - examination in Latin. Elements of mathematics.	- - -	- - examination in Latin and Greek.	- - examination in Latin.	- - examination in Latin.	- - examination in Latin.	- - examination in Latin and Greek.	- - examination in Latin.
- - 27 months; of these, 18 in winter sessions.	- - must be engaged for four years in the acquirement of professional knowledge.	- - 4 years' professional study, including 18 months at a metropolitan school.	- - 4 winter sessions at a school, 6 months each.	- - 24 winter months at a school, or 18 winter and 6 summer.	- - 3 winter and 2 summer sessions at a school.	—	—
- - 2 c. of 6 months, each, 110 lectures.	- - 3 sessions of anatomy, 7 months each, 140 lectures.	- - 5 c. of 6 months, 6 lectures per week.	- - 1 c. of 6 months, 110 lectures.	- - 2 c. of 6 months each, 110 lectures.	- - 2 c. of 7 months each, 140 lectures.	24 months - -	18 months.
- - 12 months, with demonstrations.	- - demonstrations, 300, dissections; 21 months.	- - 18 months, with demonstrations.	- - 6 months, with demonstrations.	- - 6 months, with demonstrations.	- - 12 months, with demonstrations.	- - 12 months, with demonstrations.	- - 12 months, with demonstrations.
- - 1 c. of 6 months, 110 lectures.	- 1 c. of 6 months, 70 lectures.	- - 2 c. of 6 months each, 60 lectures.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 100 lectures.	12 months - -	6 months.
60 lessons - -	1 course -	- - or 1 c. and 1 c. 6 months.	- - -	- - 1 c. of 3 months	- - instruction, extent not stated.	6 months - -	- - or 3 months, and 3 months.
- - 1 c. of 6 months, 110 lectures.	- - -	- - -	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 110 lectures.	- - -	- - -	6 months.
- - 2 c. of 6 months each, 110 lectures.	- 2 c. of 6 months each, 70 lectures.	- - 3 c. of 6 months, 3 lectures per week.	- - 1 c. of 6 months, 110 lectures.	- - 2 c. of 6 months, 110 lectures.	- - -	12 months -	18 months.
- - or 1 course, and 1 c. of 6 months, 60 lectures.	- - -	- - -	- - -	- - -	- - -	- - or 6 months, and 6 months.	- - or 12 months, and 6 months.
- - 6 months, 2 meetings per week.	- - -	- - instruction during the whole hospital attendance.	- - -	- - 6 months, two meetings per week.	- - -	- - 8 months, 2 or 3 lectures per week.	6 months.
- - 1 c. of 6 months, 110 lectures.	- - 1 course, 70 lectures.	- - 1 c. of 6 months, 3 lectures per week.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 100 lectures.	4 months - -	6 months.

Figure 5.1c: Courses for Study for Medical Degrees and Licenses



- - 1 c. of 6 months, 110 lectures.	- - 1 course, 70 lectures.	- - 1 c. of 6 months, 3 lectures per week.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 100 lectures.	4 months - -	6 months.
- - 6 months, or apprenticeship.	6 months -	- - -	- - -	6 months - -	- - 5 years' apprenticeship to an apothecary.	- - apprenticeship, or 3 months.	- - apprenticeship, or 6 months.
- - 1 c. of 6 months, 110 lectures.	- 1 course, of 6 months, 70 lectures.	- - 1 c. of 6 months, 3 lectures per week.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 110 lectures.	- - 2 c. of 6 months, each 100 lectures.	- - 12 months, or 6, and 6 of general pathology.	- - 12 months, or 6, and 6 of general pathology.
- - 6 months, 3 meetings per week.	- - -	- - instruction during 12 months.	- - -	- - 6 months, 2 meetings per week.	- - instruction, extent not stated.	- - 8 months, 2 or 3 lectures per week.	6 months.
- - 1 c. of 3 months, 60 lectures.	- - 1 c. 70 lectures, with practical instruction.	- - 1 c. of 6 months, 60 lectures. Lying-in Hospital or Dispensary, 6 months.	- - 1 c. of 6 months, 110 lectures.	- - 1 c. of 6 months, 110 lectures.	- - 2 c. of 6 months each, 60 lectures; practical instruction.	5 months - -	6 months.
- - 1 c. of 3 months, 60 lectures.	- - 1 c. 25 lectures.	- - 1 c. of 6 months, 60 lectures.	- - 1 c. of 3 months, 60 lectures.	- - 1 c. of 6 months, 110 lectures.	1 c. 50 lectures -	—	—
- - -	- - -	- - -	- - -	- - -	- - -	(*see* Practice of Medicine.)	—
- - -	- - -	- - -	- - -	- - 1 c. of 6 months, 60 lectures.	- - 1 c. of 3 months, 50 lectures.	3 months, 50 lectures.	6 months.
- - -	- - -	- - -	- - -	- - -	- - -	5 months.	—
21 months -	30 months -	36 months -	2 years - -	18 months -	- - 18 months, or 12 at an hospital, and 6 at a dispensary.	18 months - -	24 months.
- - 1 c. of 3 months, 60 lectures.	- - -	- - -	- - -	- - -	- - -	5 months.	—
- - -	- - -	- - -	- - -	- - -	- - apprenticeship as above.	—	—
21 years - -	21 years -	- - -	21 years - -	- - -	21 years - -	- - from 21 to 26 years.	- - from 20 to 24 years.

for situations in the Medical Department of the Navy, are required " to produce certificates from one of the Royal Colleges of Surgeons of London, Edinburgh or Dublin, of their fitness for the office."

By the Regulations of both services, candidates must produce proof of having received a classical education, and certificates of moral character, and of being unmarried.

In consequence of the opinion recently delivered by the Attorney-general of England, those persons who hold a Scotch or Irish diploma or degree in Surgery, are now admitted " to the same rights under the Poor-law Amendment Act as members of the Royal College of Surgeons of London."

In order to secure accuracy in this tabular view, it was submitted in proof to the different public bodies, for inspection and correction; and was corrected by all of them.

Edinburgh, 30 October 1843.

Figure 5.1d: Courses for Study for Medical Degrees and Licenses

Conclusion

The direct engagement of Parliament in the medical education reform movement fostered the institutionalization of scientific medicine within British universities, ultimately resulting in passage of the Medical Act in 1858. Between the first Parliamentary report discussed in this chapter and the passage of the 1858 Act, there were failed attempts to produce passable legislation on medical education. These intermediate bills on medical education and regulation of practitioners were introduced and then failed—roughly during the years of 1844-1857. The bills were on a variety of topics ranging from rules for general practitioners, recognition of degrees at Irish universities, and regulation of medical practice.[130] Medical education reform established university curriculum as the primary mode of initiation into medical practice. During the period of reform, medicine emerged as a regulated profession in Britain taking its place as part of the science curriculum at the universities. One of the major contributions of medical education reform was to ensure that medicine was taught scientifically.

[130] One example is the 1844 bill titled "For the Better Regulation of Medical Practice throughout the United Kingdom," which opens "for the good of all Her Majesty's subjects that the knowledge of Physic and Surgery should be promoted, and that means should be afforded whereby those who have been examined and found skilful by competent authority may be known from ignorant and unskilful pretenders to the same knowledge."

Chapter 6

Conclusion

> *Both in the sciences and in philosophy it is … history that constitutes the ultimate arbiter of questions about truth and reality. Are we then to be charged with idolization of History? I think not. History is no standard external to the arts and sciences: for all of them it is, as Schleiermacher called it, 'the realm of reflection.'*
> Nicholas Jardine 2000, 233

On August 2, 1858, the bill introduced in the House of Commons to regulate medical practice and education received Royal Assent. The final bill to pass was the sixteenth in a series of bills addressed to medical reform and regulation (Newman 1957, 186). The Medical Act of 1858 was not satisfactory to the more radical reformers, like Thomas Wakley, but many did concede that it was a step in the right direction. In October 1858, Wakley's publication *The Lancet* commented on the new Medical Act:

> [A]fter many years of agitation and labour they had obtained a measure of reform which, such as it was, … they were bound to make the most of for the benefit of the profession and the public. … There were, no doubt, differences of opinion on some points amongst those assembled, but they would all agree that the Act would afford a means of distinguishing the regular practitioner from the impostor. … With respect to the new Act, [it] … form[ed] the most important epoch in the profession. (1858, 458)

As suggested in *The Lancet*, the Medical Act of 1858 signified a new epoch in medical education. Now, the public could identify medical practitioners based on legitimate educational qualifications approved by the designated body "The General Council of Medical Education and Registration of the United Kingdom."[131] The Act was a criticism

[131] The General Council served under the auspices of the Privy Council and supervised the operation of the Medical Act (Poynter 1966, 195).

of the status quo and sought to establish and enforce a higher standard for medical education and its resulting practice. Furthermore, the Act gave statutory recognition to a distinct category of, physician, the "legally qualified Medical Practitioner" (Roberts 2009, 37).

This legal qualification was directly linked to medical education. The Act announced a system of standards by which to distinguish "regular" from "irregular" practitioner based on his education. Medical "experts," or "regular" practitioners, were now legally defined by the knowledge and skills they presumably acquired in medical schools. The Medical Act established disciplinary criteria that gave sanctioned medical knowledge a recognizable form. It codified the discipline of medicine within Britain's institutions of learning. The arbiter of these educational standards was the General Council. Members of the General Council were selected from the British universities and from the colleges of surgeons and physicians in Britain, with six additional members from each country (England, Ireland, and Scotland) selected by "Her Majesty with the advice of Her Privy Council" (Medical Act 1858, 2). Each member would serve up to a five-year term and could be reappointed. The members of the General Council also had to qualify under the same registration regulations as all practitioners under the Medical Act. The General Council was free from direct political control, which ostensibly allowed them to act as an independent body. The Act licensed the General Council to form the machinery to distinguish non-qualified, uneducated practitioners from the qualified. [132]

[132] Loudon points out "The distinction between the regulars and the irregulars was now clear. Medical reform, through medical education, had increased the sense of a unified medical profession. At the same time it had hardened the divisions within the profession. On the one hand you saw the hospital-based physicians and surgeons becoming ever more specialized and intent on distancing themselves from the

Obviously, this had the effect of bestowing higher social as well as professional status on the qualified practitioner—an important motivator of much of the reform rhetoric of the period. The GMC's role in relation to education was specifically stipulated in the Act:

> XVIII. The several Colleges and Bodies in the United Kingdom mentioned in Schedule (A.) to this Act shall from Time to Time, when required by the General Council, furnish such Council with such Information as they may require as to the Courses of Study and Examinations to be gone through in order to obtain the respective Qualifications mentioned in Schedule (A.) to this Act, and the Ages at which such Courses of Study and Examination are required to be gone through, and such Qualifications are conferred, and generally as to the Requisites for obtaining such Qualifications; and any Member or Members of the General Council, or any Person or Persons deputed for this Purpose by such Council, or by any Branch Council, may attend and be present at any such Examinations. (Medical Act 1858, 6).

The underlying perspective of their authority was to ensure that medical practitioners had "requisite Knowledge and Skill for the efficient Practice of their Profession" (Medical Act 1858, 6). The explicit claims here were to define what medicine was as a university subject and establish the necessary qualification through which successful examination on the stipulated subjects would prove. The Act took questions of requisite knowledge seriously insofar as the General Council's authority implied the necessity to see that scientific medicine had adequate educational criteria and sound guidelines.[133] The

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general practitioners. On the other, you saw the general practitioners covering all aspects of medicine, but excluded from hospitals and teaching" (1995, 241-2).

[133] The General Council's first Committee on Education in 1859 adopted the following recommendations: (1) All students should pass an examination in general education before they began their professional studies, (2) the Council would leave examinations in general education to the universities, (3) students would be compulsorily registered with the licensing bodies, (4) twenty-one was the minimum age to be licensed, and (5) four years of professional study after the general education exam required. The General Council did not give medical course recommendations until 1867 and listed the following: anatomy, general anatomy, physiology, chemistry, materia medica, practical pharmacy, medicine, surgery, midwifery, and forensic medicine (Poynter 1966, 197-9).

General Council defined a qualified medical practitioner by establishing disciplinary criteria for what he claimed to know in the name of his expertise. The stipulations for educating medical practitioners had these components: (1) requiring criteria for a medical student's course of study and examinations, (2) standardizing the mode of conducting examinations, (3) approving of and ensuring examination in general and preliminary education in the arts,[134] and (4) authority to revoke qualification credentials from any body not complying with the General Council's recommendations.[135] Their basic responsibility was to ensure that medical practitioners were trained in a systematic fashion, and to remain always attentive to the modes and methods by which students were educated and examined. This intellectual investment in the discipline of medicine continued to play out as the General Council evolved after the 1858 Act was passed. The other related jurisdiction of the General Council was to maintain a medical register of qualified practitioners as well as publishing a book of approved or safe medicines called the British Pharmacopœia.

Scholars have argued that status and public recognition also drove reform and regulations in medical education. [136] The Act made the distinction between the "regular" and "irregular" practitioners clear. The reforms resulted in a clarified disciplinary

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[134] "When the General Medical Council first met in 1858, with the whole field of medical education to attack, they agreed that the first thing to be considered was the mode of improving the general education of the student. … they wanted to see to it that the profession should, in future, be recruited from a better sort … in other words, should constitute a 'profession', purged of the remnants of commercialism inherent to the old, trade-delivered apothecary" (Newman 1957, 194-5).

[135] The Council had the authority to demand information from licensing bodies on their courses of study and examinations and report to the Privy Council any substandard practices. In the case of substandard practices, the licensing body's privileges were withheld until improvements were made. (Poynter 1966, 196).

[136] See Roberts 2009 and Shortt 1983.

representation of medicine, but did not of themselves resolve traditional status conflicts. "On the one hand you saw the hospital-based physicians and surgeons becoming ever more specialized and intent on distancing themselves from general practitioners, … [while] general practitioners … [were] excluded from hospitals and teaching" (Loudon 1995, 241-2).

During the decades leading up to the passage of the 1858 Medical Act, Parliament, the medical press, and educators debated ideas about medical reform and related educational issues. These debates emphasized the relationship between medical education and medical practice, mounting a critique on how well the medical discipline had organized historically. Although the Medical Act perpetuated existing status divisions despite acknowledgement of general practice, the Act itself reads as an important interpretation of how the medical discipline manifest in British institutions. The Act comments on institutional commitments to medical education, cultural environments in which medicine was taught and practiced, as well as the legal transformation of the medical discipline. One can readily discern the institutional impact of the Act in relation to curricula recommendations, the production of discourses about medical education, and emphasis on standards of practice.

Implications of This Study

Nicholas Jardine smartly advises that a "primary context for the legitimation of established [disciplinary] methods and practices is education" (2000, 121). Within the institutional trappings of education, one finds the objects for study and analysis of how

disciplines originated and formed at both theoretical and practical levels. My study has looked at medical education in the late eighteenth and early nineteenth centuries in Britain in light of the complexities of disciplinary legitimation and pedagogical practices. During this period, reformers pressured, challenged, and transformed the framework of teaching medical students with the goal of making medical humanists into medical scientists. Ultimately, the reformers' efforts succeeded in redefining medicine as a discipline, which was methodical, self-conscious, and shared among experts (Lyne and Miller 2009). This was a broad effort to remake and reaffirm the disciplinary status of medicine through teaching practices founded on a systematic science. Medical education reform in Britain established and (re)shaped the discipline of medicine through: (1) underscoring the importance of teaching practices to the establishment of authorized disciplinary knowledge, and (2) defining legitimate medical practitioners in the name of their disciplinary expertise. Like Jardine, I believe "such studies may uncover the alliances and conflicts … interests and resources that mediate the formation, fusion, fragmentation and [or] extinction of entire disciplines" (2000, 110).

In the case of the discourses studied here, my aim has been to show, through a rhetorical analysis, how between roughly 1770-1858 in Britain, medical education transformed as a discipline. This transformation largely manifested by disciplinarily shaping medicine as a science and not an art, thereby, establishing new criteria for what counted as medical knowledge. I find evidence for these changes in the texts I have studied. Though this may seem like a simple exercise, it illuminates one distinct advantage for our understanding of medicine's development as a discipline: rather than

draw primarily from broad theoretical constructs to look at changes in medical education and its intellectual history, I focused my efforts on specialist discourses of this period. The discourses I have treated convey the complexity of medical education reform at this time, namely, how medicine began to develop a recognized institutionalized system for educating experts through teaching practices, how science became the operating mode of inquiry in medical education, and how his shift was largely based on legitimation claims to science as necessary to advance medical knowledge and disciplinary status. Cahn provides an explanation of the value of this type of analysis to histories of medicine:

> A rhetorical analysis of the history of [medicine] attempts to understand the polemic value of the discourse of a given discipline. It will analyze the assertions and theories of a discipline for the value they possess in the making of that discipline. … By asserting their independence from those who are to accept, use or to buy their insights, disciplines gain a degree of authority. (1993, 80)

My rhetorical analysis argues the importance of scholarly attention to these discourses that I propose authorize and develop the medical discipline within institutions in new ways. Moreover, it claims the value of their subject matter in shaping medicine as a science. As evident in these discourses, through medical education reform, medicine established itself as a scientific discipline.

As I pointed out in Chapter Three, Cullen's teaching practices and medical treatises were developed with the intent of grooming students to acquire certain habits of thought more common to a system of science. Aware that practitioners could not attain certainty in all medical cases, Cullen hoped to develop a method of teaching that trained students to use classifications on a general level to situate the patient in relation to disease, not the other way around. These classifications served as a heuristic for students

and practitioners. A professor of medicine at the University of Edinburgh, Cullen was part of a medical school that distinguished itself in Britain through its innovative teaching practices. Cullen was at the center of these innovations.

In Chapter Four, my consideration of the medical periodical of early nineteenth-century Britain highlighted disciplinary questions during this moment of profound transformation. The medical periodicals represent well-respected journals that concentrated their efforts on working out the complexities not only of emerging medical science, but also the politics of the institutions in which medicine lived. Moreover, attention to these periodicals reveals the overarching idea at this time that knowledge should be diffused through publications. Medical education echoed in the pages of these periodicals as an important part of the professionalization of medical practice and its institutional placement in British society.

In Chapter Five, I turned to Parliament. It is appropriate to end with Parliament's three major reports on medical education and practice in mid-nineteenth-century Britain. Reformers turned to Parliament in part because medical education reform was not happening organically and, secondly, in order to secure a professional and disciplinary status in the eyes of the public to protect qualified practitioners from quacks. Responsible medical education reform assumed that science should be the focus of training students—humanistic/liberal arts study was only preparatory. Parliament's involvement also marked the beginning of unabated university dominance of medical education. Prior to this period, there were many ways to study medicine. Linking reform to university medical education ensured legal control over its curriculum and the ability to unite medicine

through disciplinary identity. Furthermore, these chapters suggest that the changes in medical education during this period are strongly connected to promulgating the view of the medical scientist as well as adapting medical curriculum to reflect scientific priorities.

Clearly the weakness in medical education's disciplinary adoption of science in its reforms is that it insists that medicine as a discipline is only legitimated through scientific investigation and habits of thought. Moreover, without a pervasive humanism in medical education, the medical practitioner is ill-equipped to remove his or her practice from scientific procedures and forced measures of reliability. Generally, in scientific medicine, we do not have complete knowledge to satisfy all the conditions for a cure. We see this in debates about preserving or strengthening the humanities in contemporary medical education:

> What has happened to medical humanism? … 'Medicine connects technical and moral questions in its clinical decisions: it is required to be both objective and compassionate. … [Current] medical educators have chosen to tackle this problem [by] teaching … the liberal arts. … These programmes, however, … are also the prey of the hidden curriculum: the view of some faculty and students [is] that they are the preserve of 'soft learning' and a diversion from 'real courses', such as anatomy, biochemistry and surgery. (Halperin 2010, 76)

University medical schools are much different places now due to scientific advances and the view that this should consume the medical student's education. Similarly, among the nineteenth-century medical education reformers in Britain, the view persisted that science, as a form of knowledge, would advance medicine. In indicating to students that they should learn medicine scientifically, science has become an unassailable axiom that medical educators should not question. In my final analysis, I do not wish to pronounce

characterizations on the medical discipline. My hope is only that this dissertation demonstrates that by studying medical education, rhetoricians of medicine are well poised to treat issues of disciplinarity and knowledge formation through a grounded study of educational institutions and practices. In my view, this allows one to carve out the criteria of what counted as knowledge within disciplines and institutions during given historical periods in a more robust and purposeful manner.

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This section lists eighteenth- and nineteenth-century materials, principally related to medical education and the medical reform movement in Britain. Many of these primary texts are available through the Nineteenth Century British Pamphlets Project, British Parliamentary Papers, and the University of Minnesota's Wangensteen History of Medicine Collection. Other materials were obtained at the Wellcome History of Medicine Library and the British Library in London, England.

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